

**The Influence of Digital Writing  
on Writing Development and Writing Instruction  
in Traditional Paper-Based Curriculum**

by

Emma Florian

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Literacy Birth-Grade 12  
Department of Language, Learning and Leadership  
State University of New York at Fredonia  
Fredonia, New York

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Department of Language, Learning, and Leadership

CERTIFICATION OF THESIS/PROJECT CAPSTONE WORK

We, the undersigned, certify that this project entitled The Influence of Digital Writing on Writing Development and Writing Instruction in Traditional Paper-Based Curriculum by Emma Florian, Candidate for the Degree of Master of Science in Education, Literacy Birth to Grade 12, is acceptable in form and content and demonstrates a satisfactory knowledge of the field covered by this project.

  
Dr. Cindy Bird, PhD.  
Master's Capstone Advisor  
EDU 659 Course Instructor  
Department of Language, Learning, and Leadership

April 20, 2016  
Date

  
Dr. Cindy Bird, PhD.  
Department Chair  
Department of Language, Learning, and Leadership

May 20, 2016  
Date

  
Dean Christine Givner, PhD.  
College of Education  
State University of New York at Fredonia

June 15, 2016  
Date

# **THE INFLUENCE OF DIGITAL WRITING ON WRITING DEVELOPMENT AND WRITING INSTRUCTION IN TRADITIONAL PAPER-BASED CURRICULUM**

## **ABSTRACT**

Digital (technology-based) writing is becoming prevalent especially among children and youth; they in turn bring many forms of digital writing into the classroom. On the other hand, proficiency level with paper-based writing remains low for many students. To address this problem of low proficiency and increasing digital writing from the perspective of a literacy specialist, the research question is, “how does digital writing influence writing development and writing instruction in the traditional paper-based curriculum?” To answer that question, a literature review and research synthesis have been conducted and have produced several findings. First is that the most frequently used forms of digital writing appear to be e-mail, blogs, wikis, software programs such as Microsoft Word, and writing that includes mixed forms or multimodal writing. The greatest influence of all forms of digital writing appears to be on students in grades 4 to 6, while the writing development of elementary and high school students is influenced in the areas of grammar and text structure. The influence of digital writing appears to become more complex as grade levels increase, with grades 1 to 6 influencing willingness to write and grades 10 to 12 influencing higher-level thinking. The fifth finding is that researchers appear to view digital writing as an instructional tool to benefit diverse, struggling and at-risk students. These findings form the basis of a professional development project presented on Google sites for Kindergarten to grade 12 classroom teachers.

## Table of Contents

<b>Abstract</b>	<b>i</b>
<b>Table of Contents</b>	<b>ii</b>
<b>Chapter 1: Introduction</b>	<b>1</b>
Statement of the Problem	
Background	
Terminology	
Theoretical Framework	
Rationale	
<b>Chapter 2: Literature Review</b>	<b>4</b>
Introduction to the Review	
Participants in Grades One to Three	
Participants in Grades Four to Six	
Participants in Grades Seven to Nine	
Participants in Grades Ten to Twelve	
Summary of the Review	
<b>Chapter 3: Methodology</b>	<b>22</b>
Data Collection	
Data Analysis	
Synthesis	
<b>Chapter 4: Results and Application</b>	<b>31</b>
Results of the Review	
Application of Results to a Professional Development Project	
Design of Professional Development Project	
Project Ties to Professional Standards	
<b>Chapter 5: Discussion and Conclusion</b>	<b>36</b>
Overview of Study and Findings	
Significance of the Findings	
Limitations of the Findings	
Conclusion: Answer to Research Question	
Recommendations for Future Research	
<b>References</b>	<b>40</b>
<b>Appendix A: Format of Professional Development</b>	<b>43</b>
<b>Appendix B: Evaluation of Professional Development</b>	<b>44</b>

## Chapter 1: Introduction

### Statement of Problem

Classrooms today promote traditional paper-based writing, especially for assessment and standardized tests. However, in today's society, digital (technology-based) writing is becoming more prevalent. Lamb and Johnson (2012) support that idea by advocating that "young people must learn to write using a variety of tools, from iPad apps to multimedia generators" (p. 57). From a young age, children today are interacting with digital technology and participating in digital writing activities through a range of Apple products and starter laptops: "studies of youth culture show the ways our children are adapting to digital media, and participating in a variety of virtual communities" (Hicks, 2013, pp. 1-2). Digital writing is growing in society and is being brought into the classroom by students. According to one interpretation of *The Nation's Report Card: Writing 2007* which is released annually by the National Assessment of Educational Progress (NAEP), "only a third of eighth-graders and fewer than a quarter of high school seniors tested at or above the proficient level, defined as competency over challenging subject matter" (Tachibana, 2008, para. 1). This low proficiency level in school-based paper-based writing and students' increasing use of digital writing creates a problem for teachers and school administrators. The problem is uncertainty about how teachers and schools will or should respond to students' increasing use of digital writing outside of school. To address the problem from the perspective of a literacy specialist, this research study asks the question, "how does digital writing influence writing development and writing instruction in the traditional paper-based curriculum?" To answer that question, a literature review of the research has been conducted and synthesized to produce new knowledge about the influence of digital writing on writing development and writing instruction. This synthesis in turn forms the basis for a professional development project intended to increase educators' knowledge about digital writing and its influence on writing development and writing instruction in the traditional K-12 curriculum.

## **Background**

The integration of technology into the classroom setting is of interest to me, especially as I spend more time working in classrooms. I see Smartboards, computers, and iPads as the forms of technology that students are using in the classroom. My own experience working with students has shown me the tasks that they are completing through these devices. In a class of sixth grade AIS students that I have worked with, the students used iPads to complete writing activities that were shared through blog posts. My observation of classroom blogging is when my interest in digital writing began. I noticed the positive impact that digital writing had on the students, especially in a traditional paper-based curriculum setting. For example, one particular struggling writer expressed his enthusiasm for writing blog posts and received his best writing grades during this unit. The students also showed great excitement to collaborate through digital means and spent much more time writing than during traditional writing time. This seemed to positively impact their writing experience. This experience consequently led me to select this topic because I feel it may be beneficial for teachers and students to have an understanding of the influence that digital writing could have on writing development and writing instruction in a traditional paper-based curriculum. Professional development about the influence that digital writing may have is valuable because this topic will give teachers information that they are then able to use during writing instruction.

## **Terminology**

For the purpose of this research study, terms are defined below to provide the reader with a better understanding of the topic. The first key term is “digital writing”. Hicks (2013), author of *Crafting Digital Writing*, defines digital writing as “writing that is produced using various electronic media” (p. 4). This definition represents my view of this term that I am holding throughout this research study. Other key terms are “traditional curriculum” and “writing instruction.” Traditional curriculum and writing instruction are defined by the WIDE Research Center as “principles and practices of composition, which are based (implicitly) on a print view of writing” (WIDE, 2005, p. 2). This term also represents my view of traditional curriculum and writing instruction in a paper-based setting.

## **Theoretical Stance**

In this research study on the influence of digital writing in the traditional paper-based curriculum, the approach to literacy is based on the theory of literacy as a social practice (Gee, 1991). As technology grows, “the use of reading and writing in school settings and the kinds of literacy embedded in new social practices continues to grow” (Merchant, 2005, p. 50). Digital writing is a type of social practice. As Merchant (2006) explains, “writing itself is a technology for remembering, recording and organizing our social experience” (p. 93). Digital writing connects technology, writing, and audience and can do so within a classroom setting. Digital writing is a practice “which involves the production and consumption of different kinds of texts, and the development of new kinds of relationships and interactions” (Merchant, 2005, p. 85); as such, it appears to be very appropriate for a school curriculum. Therefore, the theoretical stance that supports this research study is digital writing as a form of literacy as a social practice.

## **Rationale**

The rationale for this research study is the current relevance of this topic, that digital and electronic writing are growing in society and are being carried into the school by students. For example, companies such as VTech are selling electronic learning tools (laptops, tablets) designed for use by preschool students; these students will likely then want to take the laptops into school when they go or have expectations that learning in school will be similar to learning at home with technology. With this increase in using these types of devices, digital writing is increasing as well. Most of these same children who are often utilizing digital writing and literacy out of school are attending traditional non-digital based schools (unless they attend an online school). As the *Nation's Report Card* (NAEP, 2007) reports, one third of eighth-graders and less than one fourth of high school seniors scored at a “proficient” level in writing. These figures and the retail market demonstrate for both teachers and school administrators the problem of low proficiency levels in school-based writing and a continued increase in student usage levels in digital (technology-based) writing. Therefore, this research study into the influence of digital writing on curriculum is worth undertaking because the topic is so current and timely.

## Chapter 2: Literature Review

### Introduction to the Review

To address the research question of the influence that digital writing has on writing development and writing instruction in the traditional paper-based curriculum, an exhaustive review and synthesis of the literature have been conducted. Many academic databases have been searched using the keywords of *writing instruction*, *writing development*, *blogs*, *wikis*, *emails*, *online writing instruction*, *digital texts*, and *traditional literacy*. The research studies that were found can be grouped into four categories based on the grade level of the participants. The first category is those studies that examine participants in grades one to three. The second category is those studies that examine participants in grades four to six; the third is those studies that examine participants in grades seven to nine, and the fourth category is those studies that examine participants in grades ten to twelve.

### Participants in Grades One to Three

A search of the databases found no studies related to digital writing with participants below the grade one (six year old) level. A few studies have been found that examine participants in grades one to three. The research studies in this section specifically examine the types of digital writing that have been researched with students in this grade range. Merchant (2003) examined a teacher's use of e-mail as a means of providing support for writing instruction. A total of 38 students in the 7-10 years age range (about grades two to five) participated in this study. The participants' academic achievements were described as "broadly in line with national UK standards for reading" (p. 106), meaning that these participants were likely all performing at grade level. The participants were engaged in "extended classroom writing projects" (p. 105) over the course of three to five weeks with interactive e-mail communication being the primary means for instruction. Participants chose a writing partner to collaborate on the "planning, development, and writing up of the final story" (p. 106). The researcher, or "remote writing adviser" (p. 106), periodically visited the classrooms and exchanged interactive e-mails with the participants throughout the project. The e-mails were

initially “concerned with negotiating the overall shape of the narrative in composition, whilst the other group includes messages that request specific help in the act of writing” (p. 106). As time went on and stories developed, “in some cases, the e-mails themselves became story fragments” (p. 107). After data analysis of the e-mails, Merchant determined that “creativity and experimentation can be fostered through digital communication in new and exciting ways” (p. 109). Digital conversations carried on through e-mail can be used to “support and extend existing classroom activity based on traditional print-based literacy by recruiting aspects of children’s identity and experience that are more commonly associated with out-of-school literacy” (p. 109). The researcher concludes that digital writing of e-mail can be used as a form of writing instruction with students in the grades two to five range.

Focusing on just third grade students, Mills (2011) examined “the students’ shifting of meanings--transmediation--across sign-systems in the context of media-based textual design” (p. 58), which means the researcher focused on the influence of multimodal digital writing on students’ writing development. The researcher collected data during the second year of a digital media intervention in a primary school in Southeast Queensland, Australia. The study involved three teachers and their grade three students who had an average age of eight years. These students’ mean writing scores were “30 percent below the national mean for all Year 3 students in Australia” (p. 58). The media intervention program introduced students to “the features of new digital text types—blog pages, podcasts, micro-documentaries, web profiles, digital stories, and online comics” (p. 58). Students then wrote digital texts that “shifted semiotic content from one mode or sign-system to another through transmediation” (p. 58). That is, they learned to express the same content in and across multiple digital forms. Data were gathered through print and digital artifacts, audio-recorded focus groups, dialogue with individuals, and focused lesson observations. Findings from this study showed that “transmediation” appeared to be “fundamental” (p. 62) to writing digital texts and therefore, writing development. Mills determined that “crossing from print to digital modes adds an important layer of complexity to text and knowledge creation” (p. 62). Mills concluded that the more new digital technologies, the more possibilities for transmediation of content to occur and for students’ writing to develop especially in the area of multimodal writing.

The writing of multimodal texts requires some sort of computer device. Grimes and Warschauer (2008) investigated the implementation of a one-to-one laptop computer program in

three schools with diverse student populations in a district in Southern California. They worked with students in grade three but also in all grades up to grade eight. The researchers specifically asked, “how did implementation of the laptop program change teaching and learning patterns in the schools, how did teachers and students evaluate the laptop program, and what measurable impact did the laptop program have on students’ test scores” (p. 309). Participating in this mixed methods study were 62 grades 3-4 and 5-6 students, 395 grade 3-7 students, and 554 grade 7-8 students. The laptop program was implemented from 2004-2006. Data were collected through surveys, observations, interviews, and documents. The researchers reported findings in three categories to answer their three research questions; findings related specifically to writing were included as a subcategory of the first category of findings: “teaching and learning patterns” (p. 312). These findings showed that “writing and revising school papers was one of the most common uses of laptops in the three schools” (p. 314). The students used laptops “in all stages of the writing process” (p. 314). The use of the laptops also appeared to have “several major advantages for the teaching of writing” (p. 314) by providing the students with easier access to “information and data in instruction and research” (p. 317) and to feedback from teachers. The use of laptops also appeared to have an influence on writing development by increasing the “length and formats” (p. 316) of the students’ written work. Although this study did not explicitly or exclusively discuss the influence of digital writing on writing development or writing instruction, the results do imply that implementing a school-wide laptop program can provide students in all grades with positive writing experiences.

### **Participants in Grades Four to Six**

Although only a few studies worked with students in the grades one to three range, several studies have been found that examined participants in the grades four to six range (about ages nine to 12 years). In a study in which researchers examined the influence of e-mails used as an instructional tool, Burnett, Dickinson, Myers, and Merchant (2006) explored “the use of peer-to-peer digital communication” (p. 14) to impact classroom practice. They specifically looked at how teachers “provide opportunities for pupils to explore e-communication in ways that are meaningful to them” (p. 14). Participants were 12 mixed Year 3 through 5 students, six (three girls and three boys) from a rural school in Derbyshire, England, and six (three girls and three

boys) from an urban school in Sheffield, England. After initial exploration of students' views and interests, researchers "randomly selected" (p. 15) the participants who were then "partnered with a child of the same gender in the other school" (p. 15). The participants used individual e-mail accounts to communicate with their partners. The participants e-mailed each other and met face-to-face twice as preparation for producing a joint PowerPoint presentation. Data were gathered through samples of participants' writing at different stages of the project, observations, and semi-structured interviews. Data analysis produced three categories related to writing (written e-communication): "transforming the way children write," "transforming what children write," and "children's perceptions of digital texts" (p. 16). These categories show the influence that e-mail writing had on the participants' writing development. Findings from this study indicated that "email partnerships are worthwhile because they provide experience of an important medium of asynchronous communication" (p. 25). The researchers concluded that using email encouraged participants to communicate in writing with an actual audience and "engaged" (p. 20) them in this form of written communication. Therefore, the use of e-mail partnerships to create a project appears to be a positive element in writing instruction and also for writing development.

deVries, vanderMeig, Boersma, and Pieters (2005) also investigated the use of e-mail as a "tool for collective reflection in the primary classroom" (p. 169). The researchers asked two questions: "how can e-mail be implemented in the classrooms so that children become engaged in collective reflection?" and "what is the reflective nature of the e-mail activities?" (p. 170). The researchers conducted two design experiments. In the first experiment, 16 groups of students, eight from each of two primary schools, participated. One school had a "normal student population, the other housed children with learning and behavioral disabilities" (p. 172). The participants were 10 to 12 years of age in grades 5 and 6. E-mail was embedded in a "learning-by-designing-task in the domain of biology" (p. 170). To support "collective reflection" (p. 170), the groups from one school were paired with the groups at the other school; e-mailing was done in a fixed time, and a paper worksheet was used to help participants focus on collaborative writing. Data were gathered through classroom observations, field notes, and informal interviews. Data analysis showed the teachers' implementation of the e-mail tool, the participants' engagement in collective reflection and e-mail use, and the reflective nature of the e-mails. Results indicated that the participants utilized e-mail to engage in the required task and participated in "intellectual reflection" (p. 176). Therefore, this experiment demonstrated the

influence of the e-mail tool on writing instruction. In the second experiment, there were 12 groups of participants from three primary schools who were also 10-12 years of age in grades 5 and 6. The researchers adapted the e-mail tool through a simplified worksheet and a free writing activity to influence group reflection through e-mail. Results from this second experiment showed that the free writing involved in the production of e-mail had “structured and smoothed collaborative writing” (p. 178) and “lead to more equal participation” (p. 179). The results of these two experiments demonstrated that the writing tool of e-mailing does appear to have an influence on both writing instruction and writing development.

Moving from e-mail to classroom-based blogging, McGrail and Davis (2011) examined “what happens when 5<sup>th</sup>-graders blog and converse about literacies in class and beyond” (p. 417). The researchers wanted to examine how blogging supports writing and literacy development. Participants in this study were 16 students, nine girls and seven boys in a grade 5 elementary classroom. Participants were described as “for the most part, on grade level” (p. 418) in terms of ability. They were given introductory blogging activities, a class blog, and pre- and post-blogging writing projects. Data were collected through the pre- and post- blogging project writing samples, blog posts throughout the project, and student and teacher interviews. Throughout this yearlong study, results showed that “active engagement with the audience through the commenting feature in the current study helped our student bloggers to realize that out there was an audience other than the teacher” (p. 425). As this audience engagement occurred, “a sense of community and belonging emerged” (p. 426). This sense of belonging appeared to have created increased confidence and motivation in many of the student bloggers. Researchers determined that blogging used for instruction can result in “blurring the traditional concepts of the reader/writer relationship and writing purposes and spaces” (p. 432) and therefore has a positive influence on writing and literacy development of fifth grade students.

Myers (2014) also examined a classroom blog, but for its impact on student engagement and critical thinking. The researcher asked, “how does using digital literacy tools impact the quality of students’ reader responses and their engagement in the task?” (p. 60). A total of 40 students in sixth grade at a parochial school participated in this study. The participants were described as having “socioeconomic diversity” (p. 61) and “most of the students are white” (p. 61). The participants utilized Nicenet, a nonprofit virtual classroom, one day a week in the computer lab at their school from January to May during the 2011-2012 school year. In this

virtual classroom, the participants wrote posts in a “blog entry format, allowing them to engage in conversations, digitally, with each other” (p. 60). The classroom teacher provided blog post topics and questions to the participants. Data were collected through a reading/writing inventory, student work samples, teacher field notes/observation logs, and structured written interviews with participants. Results from this study showed “a slight shift in students’ confidence as readers and writers” (p. 62). Through the virtual classroom, the students were able to work in a collaborative learning environment. The students were also able to “see a variety of perspectives, which challenged them to expand their thinking and discover different understanding” (p. 63). Findings indicated that, “the quality of their [students’] written responses and their engagement was impacted by the use of digital tools” (p. 63). Overall, Myers found that “students’ responses became more critical” (p. 63), and students themselves “appeared to be approaching the text in a different way” (p. 63) while “their reading appeared to be more strategic compared to the more opinion-oriented responses” (p. 63) previously. This study provided research evidence of the influence of digital writing on both writing development and writing instruction.

Doult and Walker (2014) explored the use of wikis for writing instruction, but held the pedagogical belief that “collaboration can scaffold writing development, collaborative writing might help the children to increase their knowledge of the topic, and that online, multimodal, collaborative writing is a digital literacy skill which children need to learn and practice” (p. 601). The 26 participating students, 14 boys and 12 girls from nine to ten years old, were from a primary school in England. The wiki-supported writing “took place within the context of project work about the solar system” (p. 605). Participants were placed in mixed groups of four students. Each group of four participants wrote collaboratively to complete their own wiki. Each wiki page featured a discussion tab, which allowed users to post messages to one another. The teachers also had a wiki, which provided “controlled access to elements of support” (p. 606). Data were collected through student observation, a close examination of the wiki page, and semi-structured interviews with the participant groups. Results based on discussion and collaboration indicated that the students engaged in both “chatty” social writing as well as formal writing about the solar system; however, the “chatty” writing was contained within the discussion tabs and did not ‘spill over’ into the formal wiki pages” (p. 610). The students were “highly engaged with the wiki-based writing” (p. 617), as exemplified by an increase in both the quantity and quality of writing. These findings show the positive influence of wikis when used for writing instruction and the

development of collaborative writing skills.

Also with wikis, Woo, Chu, and Li (2013) examined the “potential benefits of peer commenting and editing on a wiki platform” (p. 280) for second language (L2) students’ collaborative writing. Researchers specifically investigated the kinds of comments posted, revisions made, associations between comments and revisions, and associations between revisions and improvement in students’ writing. Participants were from a Chinese primary school: 119 students, 59 boys and 60 girls aged from 10 to 12 years. The wiki tool PBworks was integrated into the students’ collaborative writing lessons within their existing English language curriculum. Students co-constructed their writing and exchanged constructive feedback and comments through the wiki platform guided by “wiki rules that were provided by the teacher” (p. 283). The classroom teacher formed student groups that then were assigned the creation of two non-fiction texts. Data were collected using “students’ comments on the wiki platform, editing information recorded in the wiki’s history page, evaluation of students’ group writing, and student and teacher interviews” (p. 284). The data analysis of the posted comments indicated that “more content and meaning level comments were made than surface level comments, and these comments tended to be revision-oriented” (p. 301). The researchers concluded that the association between comments and revisions showed that “the more comments posted by the students, the more the types of revisions recorded per 100 words” (p. 302). The association between revisions and improvement in students’ writing showed that “a significant improvement was noted in students’ group writing using a wiki compared with students’ non-wiki group writing before the introduction of the wiki” (p. 302). These findings suggest that collaborative writing on a digital wiki platform influenced the writing development of 10 to 12 year old second language students.

Moving from wikis to software programs, Sinatra, Beaudry, Pizzo, and Geisert (1994) investigated the effectiveness of using a computer software program that allowed students to “model, practice, and adopt” (p. 93) a narrative. The design of this study “aimed to determine if an integrated use of computers with semantic mapping, reading, and writing would be more effective for reading and writing success than Chapter 1 Reading Instruction approaches which did not use the computer-software mapping approach” (p. 94). Participants were 260 students in fourth grade who were “quite deficient in reading, ranging roughly from the eleventh to the sixteenth percentile in reading proficiency by the end of the third grade” (p. 96). These students

were placed in experimental or control group conditions. The experimental group used computer facilities in the schools to participate in computer-based approaches for semantic mapping or writing, while the control group did not use computer-based approaches. The experimental group used the *Thinking Networks for Reading and Writing--Narrative Program* software, which involved using semantic mapping and computer-based reading and writing activities. The control group used traditional, paper-based remedial reading and writing strategies in daily instruction. Data were gathered through teacher “pre- and post-treatment” (p. 102) surveys, teacher interviews, student surveys, and student pre- and post-writing samples. Based on the multivariate analysis of covariance (MANCOVA), results indicated that “the students using both levels [semantic mapping and computer word-processing] of the treatment achieved significantly higher scores on the post-treatment narrative essay” (p. 106). These findings showed that the experimental group experienced a positive influence on writing development. Students who used the computer software program were able to work with both word processing and semantic mapping to “apply higher order thinking” (p. 108) to their narratives. Thus the researchers found that implementing the software program influenced writing development and motivation of at-risk learners.

Zheng, Warschauer, and Farkas (2013) also examined software programs through the “effect of one-to-one laptop programs” (p. 272) on students’ writing development. Through a mixed methodology study, the researchers specifically investigated student writing outcomes, student writing processes, and differences in results among participant demographic groups. Participating in this study were fourth grade students from a school district in California and fifth grade students from a school district in Colorado. In the California school district, the laptop computer software program Student Writing Achievement Through Technology Enhanced Collaboration (SWATTEC) was implemented, focusing on “the six traits writing approach” (p. 273). In the Colorado school district, Lucy Calkins’ (1994) Writer’s Workshop model, focusing on “writing for an authentic purpose and audience” (p. 274) was implemented. Data were collected using student statewide test scores, teacher and student online surveys, observations in two focal schools, semi-structured interviews, and documents. Based on writing achievement gains, results from the California school district indicated that “all students experienced higher ELA gains during both the partial laptop program and the full laptop program” (p. 282). In the Colorado school district, “the laptop program had no overall effect; however, in both districts, at-

risk students benefited from the laptop program more than their non-at-risk peers” (p. 284). The findings from both of these school districts indicated that both programs had an influence on writing instruction, as shown through increased motivation when “more than 60% of all students agreed that they became more organized, schoolwork became more interesting for them, and the quality of their schoolwork improved since they received their laptops” (p. 285). The findings suggested that “students use the laptops for language arts activities extensively and that teachers and students perceive many benefits for writing and literacy development” (p. 291). Overall, this study provided evidence that school laptop software programs that focused on student writing appeared to help improve writing development particularly for at-risk learners.

Still another study that investigated the influence of software programs on writing development was by Englert, Wu, and Zhao (2005) who examined the influence of text structure scaffolds in a Web-based scaffolding environment: Technology-Enhanced Learning Environments on the Web (TELE-Web). Participants were 12 students from an “upper elementary resource room in an urban school” (p. 186) who had school-identified learning disabilities. The participants were required to write a personal narrative under three conditions: “paper and pencil, unscaffolded and unsupported writing on the computer, and supported Web-based writing using the TELE-Web scaffolds” (p. 186). TELE-Web Supported News provided “structural reminders to prompt students’ attention to the local organization and signaling of their ideas” (p. 187) along with teacher prompts and online support. In the Unsupported News group, participants wrote on the computer using TELE-Web but did not have access to the visual and genre-related scaffolds of the News. In the paper and pencil group, the participants were given lined paper without prompts or scaffolds. Data were gathered through the three papers that each participant wrote over the course of three weeks. Data were analyzed with a “primary-trait scoring scheme” (p. 190) rubric. Results showed that 54% of students scored their highest ratings in the Supported News group indicating that they “benefited most from the provision of text structure and genre-related strategy scaffolds” (pp. 191-192). These findings suggested that “computer-supported environments could mediate and scaffold” (p. 194) the writing performance of students with student performance. The implementation of this Web-based writing scaffold software program showed an influence on students’ writing development in the classroom.

Larson (2009) explored the influence of multiple forms of digital writing on students' writing development through the use of e-books, electronic journals, and online message boards within the context of a reading workshop. There were two groups of five students each in a fifth-grade class who were selected as participants because they met two criteria: "being communicative (in writing or verbally) and being willing to work hard" (p. 639). The two groups participated in 15 sessions reading either *Bud, Not Buddy* or *The Watsons Go to Birmingham-1963*. The participants used an electronic response journal to share "personal thoughts and feelings about the literature and the e-book reading experience" (p. 640). Then, they used the online message board "to discuss and respond to the literature" (p. 640). Data were collected through field notes, a digital voice recorder, individual interviews with students and their teacher, and artifacts such as students' electronic journals and online message board transcripts. Data were analyzed utilizing the statistical summary of the online message board and printed transcripts of the discussions. Results indicated that "engagement in an asynchronous online literature discussion encouraged students to respond deeply to the literature, share their ideas with others, and carefully consider multiple perspectives and thoughts" (p. 646). In addition, results suggested that "students' engagement in online literature discussions promoted socially constructed learning" (p. 646). Larson's findings showed that allowing out-of-school technology into the school curriculum appears to produce a positive influence on literature learning.

Mills and Exley (2014) conducted a study covering professional development and multimodal digital writing. They examined "time, space, and text in a digital composition program" (p. 437). Participants were three grade 4 teachers and their 85 students aged eight to ten years, who met two criteria: "cultural heterogeneity and socioeconomic disadvantage" (p. 439). During the first year of this two year project, the research team provided digital workshops to teachers and introduced digital skills to small groups of students. The following year, the teacher, a literacy researcher, and a specialist media arts teacher implemented the program in a series of 40 one-hour lessons per classroom. The program taught students "how to design multimodal and digitally written texts across a range of genres and text types" (p. 441). Data were collected through "observations, discussion with participants, and artifact collection" (p. 442). Findings from this study showed that multimodal digital writing appeared to influence writing development, especially in the area of student motivation "in comparison with tasks that involved print-based writing without digital tools" (p. 450). Results also showed that "space in

the classrooms for the new writing program was more tightly controlled and structured” (p. 453) thus indicating an influence on teachers’ writing instruction as well.

Edwards-Groves (2011) also examined how professional development in multimodal writing impacted teachers’ technology use and writing instruction. The researcher conducted two case studies in rural inland Australia; Case 1 involved 12 teachers from five different primary schools, and Case 2 involved five teachers from one primary school. The teachers taught students ranging from kindergarten to grade 6. Both cases involved “professional learning which was ongoing and over time for both teachers and students” (p. 52). Between professional learning sessions that demonstrated technology and software use, teachers were supported through in-class visits by the researcher. The students were required to create animated presentations, class videos, and websites. Data were gathered through student observations and audiotaping of teaching, semi-structured surveys, interviews with Case 2 teachers, and a student focus group. Data analysis focused on “classroom lesson practices and participant perspectives” (p. 53). The results of this study incorporated findings on both multimodal writing and changing the pedagogy of writing. In terms of multimodal writing, “these students show an explicit awareness of multimodality in relation to audience and purpose, and gesture towards knowledge-crafting” (p. 56). Thus this study shows that multimodal writing appears to impact writing development because in discussing changing the pedagogy of writing, results found that “teamwork has a critical influence on both the process and the production of their text” (p. 58). Thus this study shows that multimodal writing appears to impact writing instruction because “many of the teachers in the study adjusted their more print-based practices to encompass a new multimodal dimension to their writing lessons” (p. 58). Results indicated a willingness by elementary teachers to modify their writing instruction to include some form of digital writing after the teachers received some professional development on this instructional method.

Also looking at multimodal writing, Allen and Thompson (1995) examined the effect of “a distance network” (p. 66) on “quality of writing produced and the attitude of the students toward writing and using technology” (p. 66). A total of 93 fifth grade students “in a rural midwestern state” (p. 67) randomly assigned to either the control or experimental group participated in this study. Throughout the eight week time period, the students completed a pre- and posttest writing sample along with four writing assignments. The writing assignments “incorporated prompts which encouraged the students to use the writing process and to

collaborate with their partners on writing the text” (p. 67). In the experimental group, college student readers “functioning as an authentic audience” (p. 67) provided the students with comments through a telecommunication network. In the control group, teachers responded in a traditional fashion to the students’ writing by writing comments on their papers. Data were collected through the students’ pre- and post-questionnaires, interim writing assignments, and pre- and post-writing assignments. Based on data analysis through statistical testing, “there were statistically significant differences on the holistic ratings of writing quality and the text word count measure with students in the experimental group scoring significantly higher than the control” (p. 68). Findings showed that “a functional writing environment that allows the students to write for authentic audiences will improve the quality of their writing” (p. 73) thus influencing writing development. Allen and Thompson concluded that integrating multiple forms of technology in order to provide an authentic audience to student writers could have a positive influence on writing development.

In another study that investigated the influence of multimodal digital writing on students’ writing development, Vasudevan, Schultz, and Bateman (2010) examined how “multimodality helps us rethink and reimagine composing [writing] processes” (p. 443). Participants were a fifth grade classroom located in a “multiracial and multinational urban public school” (p. 448). The researchers introduced a series of projects that complemented the teacher’s curricular plan and the district curriculum. The series of projects led to the culminating final project in which the students drew on visual and aural modes of digital writing and used writing, cameras, and digital voice recorders to “compose a story about themselves as readers and writers” (p. 450). The entire multimodal storytelling process was “envisioned as a curricular approach to the study and integration of multiple expressive modalities in composing” (p. 450). Data were gathered through field notes, audio and video tapes of both whole class and small group discussions, formal and informal interviews with students and the teacher, and artifacts of student writing and multimedia documents. Data were analyzed through “systematic document review to elicit patterns and themes” (p. 450). The findings from this study showed an influence on writing development based on “the power of multimodal storytelling to weave together home, community, and school contexts as sources for youths’ composing processes in school” (p. 457). The researchers found that “by extending the composing process beyond print modalities” (p. 461), students’ composing “shifted in significant ways” (p. 461). These ways included the

“construction” (p. 461) of layered texts utilizing a “wider palate of digital composing modalities” (p. 461). These findings showed that using of multiple multimodal forms of digital writing as part of writing instruction for a series of classroom projects influenced students’ writing development.

### **Participants in Grades Seven to Nine**

While many studies worked with students in the grades four to six range, only a few studies have been found that examined participants in the grades seven to nine range (about ages 13 to 15 years). Studying classroom blogging, Daskalogiannaki (2012) examined “the effect of the class-blog on students’ writing performance” (p. 271), mainly focusing on student engagement and motivation while writing. The researcher conducted “a small-scale, project-based classroom research” (p. 271) study in a State Junior High School in Greece. Participants were 12 fourteen-year-old students “attending English as a foreign language twice a week” (p. 271). The researcher, also their English teacher, “noticed the unwillingness and difficulties her students experienced when expressing themselves in writing as well as their enthusiasm every time new technologies were used in class” (p. 271). A teacher-created blog was introduced to the participants prior to the start of blogging class sessions. There were four 120-minute sessions published on the blog and administered “covering four distinct writing genres and text types” (p. 272). Participants produced a total of nine posts and 15 comments each. Blog sessions were divided into the stages of planning, translating, and reviewing. Data were gathered through classroom observation, collection of writing samples and peer feedback, an overall evaluation questionnaire, and an evaluative blog post. Data analysis of participant responses revealed six themes related to their writing: “planning, translating, reviewing and feedback provision, motivation, writing development, and writing autonomy” (p. 274). Results showed that “blogging facilitated the interpretation of the task environment, triggered brainstorming and enabled instant retrieval of useful ideas and information” (p. 274). Blog-writing also encouraged the participants to revise their drafts based on “comments and alternative suggestions from teacher and peers” (p. 275). The researcher concluded that blogging showed an influence on writing development throughout the writing lessons in that “blogging increased the quantity, quality and ease” (p. 278) of participant writing and “allowed learners to work and learn by

themselves, to reflect on their mistakes, writing progress and difficulties and consequently to take pride in their achievements” (p. 280). Thus digital writing in the form of classroom-based blogging has been shown to be a writing instructional tool that positively influences writing development.

Studying wiki-based digital writing, Kontogeorgi (2014) examined the creation of a wiki-based student journal in “an attempt to enhance students’ motivation and critical thinking in reflective collaborative writing” (p. 124). The study focused specifically on students’ writing development in terms of student motivation, collaboration, e-literacies, and process writing. The researcher conducted the mixed methods study with participants studying English at a private language institute in Greece. The participants were 35 students ranging in age from 11 to 15 years. From November to January, writing lessons took place once a week for 50 minutes. In class, a topic was introduced, class discussion was held, and the draft of the article for the student journal was started. Then, the students finished the article at home, had it reviewed by the teacher, and uploaded it to the journal. Data were gathered through a needs analysis questionnaire, qualitative interviews with selected learners, the teacher’s diary, and a post-research questionnaire. Data analysis showed “the majority of students claimed to enjoy writing articles on their wikis” (p. 137). Findings showed an influence on writing development in that the wikis “greatly assisted process writing since the great majority of students learnt to be careful with coherence and also to use cohesive devices such as linking words as well as paragraphs” (p. 140). The researcher found that the wiki journal created a “perfect authentic, contextualized environment for learners to practice and improve their writing skills” (p.145) and “motivated learners, who were actively involved, by exposing them to the infinite potential of diverse Web 2.0 tools” (p. 145). Evidence from this study showed that the integration of the wiki tool into the writing instruction curriculum influenced students’ writing development.

Looking at the influences of multiple forms of digital writing, Martin and Lambert (2015) explored middle school students' writing experiences “refining the skills required for paper-based writing but also developing competencies unique or more central to digital writing environments” (p. 217). Participants were 19 students, 15 females and four males, in grades 6 to 8. Three instructors, two participant-researchers, and four writing coaches worked with the group during a two-week summer camp that provided digital writing instruction for three hours per session. During this time “they engaged in small-group digital writing minilessons, independent

writing sessions, and one-on-one digital writing conferences” (p. 220). The adolescent students published their digital texts on the camp website, shared them orally in open-mike sessions, and sent them to a partner school. The students selected their digital writing tools and writing topics from “Microsoft Office, the Chrome search engine, e-mail, video and audio recording equipment, editing software, digital cameras, scanners, printers, and the university’s collection of children’s and adolescent literature” (p. 220). Data were collected through students’ daily reflections and texts written in various digital forms and instructors’ audiotaped interviews. Based on data analysis, three digital writing “profile groups” (p. 220) emerged: “digital passengers, digital navigators, and digital drivers” (p. 220). Digital passengers were those students who had “some access to digital technology in their environments and limited basic computing skills” (p. 221); digital navigators “reported prior technology experiences” (p. 222) and “used prior knowledge of technology during writing” (p. 222); and digital drivers reported “robust experiences with digital writing tools and texts” (p. 223). Both digital navigators and digital drivers “approached digital writing as a nonlinear process” (p. 223). Martin and Lambert concluded that adolescent students may fall into one of three profiles of digital writers, and each group has its varying “needs for support during digital writing instruction” (p. 224). The findings of three identifiable profile groups of digital writers thus indicates that the influence of digital writing on writing development appears to vary for adolescents depending on their access to and experience with related technology.

Another study into multiple forms of digital writing was by Turner, Abrams, Katic, and Donovan (2014), who investigated “how new technologies influence the development of writing and the English language” (p.165). The researchers designed a two-phased mixed method study. There were 81 adolescent students in grades 7 to 12 from “suburban, urban, public, and private schools” (p. 165) that participated in this study. From the 81 students who contributed a digital writing sample, nine were selected to be interviewed “regarding their individual language choices” (p. 166) in their self-selected examples of digital writing. These nine participants were selected based on their use of writing conventions and their availability. Data were gathered from the 81 participants through digital writing samples (text messages, IMs, and social networking posts), surveys that collected both demographic and technology-related data. Data were collected from the nine student interviews regarding language choices, and user-choice surveys focusing on the role of technology in language choices and other purposes. Data were analyzed based on

the “conventions of digitalk” (p. 168). Analysis of the multiple forms of digital writing indicated that “adolescents have, in fact, adopted [writing] conventions within their digital communities” (p. 169). Many of the conventions of digitalk were the same conventions that are used within standard writing. These findings indicated that new technologies, or multiple forms of digital writing, influence the development of writing by producing writers who willingly adopt the conventions of the writing form and who perceive the digital writing form as a context requiring the use of certain form-specific writing conventions.

### **Participants in Grades Ten to Twelve**

Only a few studies have been found that examined participants in the grades ten to twelve range (adolescents about 16 to 18 years old). Researching blogs, Manfra and Lee (2011) examined “the integration of an educational blog in two low-achieving U.S. history classes” (p. 98) while exploring whether the blogging tool could support culturally relevant instruction that “engages” (p. 98) students in “authentic intellectual work” (p. 98). Participating in this qualitative case study were a classroom teacher and students in two U.S. history classes. The students consisted of junior and senior “low-achieving and at-risk learners” (p. 98) ranging in age from 16 to 20 years. Web2.0-based instruction was provided through Edublogs.org with an Edublog site designed specifically for the participating classes. Data were collected through observation-based field notes, samples of student work, and teacher and student interviews. Based on classroom observations of teacher practice, the researchers developed a portrayal of “traditional instruction” in the high school classroom: “multimedia lecture using PowerPoint presentations, documentary films, and teacher lecture” (p. 98). They then compared that with instruction that incorporated the educational blogging tool. Results indicated that student voices heard in the Edublog comments increased compared to student contributions in traditional classroom instruction. In addition, results showed that participation while blogging “activated higher levels of thinking” (p. 105). Manfra and Lee felt that their findings regarding “authentic intellectual work” (p. 101) suggested that more direct instruction and intervention might have prompted students towards “more intellectual work” (p. 102). Manfra and Lee determined that their findings “point to the potential” (p. 103) of blog-based instruction to meet the learning needs of at-risk students and improve writing instruction for low-achieving high school students.

Researching software programs, deSmet, Broekkamp, Brand-Gruwel, and Kirschner (2011) investigated “the effects of planning and writing a text with an electronic outline tool on the quality of students’ argumentative texts” (p. 559). Participants were 34 Dutch tenth grade students, 16 male and 18 female, aged 15 to 17 years, in three history classes. Participants completed two argumentative writing tasks using Microsoft Office Word 2007 in the schools’ computer room. The tasks were given with written instruction that “introduced the topic and informed students about the required product characteristics, procedure, and available time” (p. 560). One group of students used an outline tool “embedded in the ‘view’ menu in Microsoft Office Word 2007” (p. 560) about which they received technical training prior to use. The other group of students “were not required to make an outline before elaborating their full text” (p. 562). Data on student writing were collected from the writing done using the electronic outline tool, from the full text written by all participants, and from teacher/student questionnaires. Results indicated that “students using the outline tool for the first task tended to score higher on the structure of their texts than students who did not use the tool” (p. 564). Results also showed that “students who did not use the outline tool produced significantly more arguments in their first text than students who used the tool” (p.565), which shows that it may be necessary to provide students with practice utilizing digital writing tools prior to implementing them. These findings showed that writing instruction involving the software program outline tool influenced writing development in the area of writing structure, and therefore electronic outlining has potential to influence students’ writing performance.

In another study into software programs, Turner and Katic (2009) examined the influence of computers and Microsoft Word software on writing development and “how these influences may affect the writing processes of adolescents” (p. 254). Participants were five male and four female sophomore high school students who “represented a range of writing abilities” (p. 257). The unit of instruction for this research focused on argumentative writing “where participants worked independently to complete a researched essay on the Equal Rights Amendment or the Title IX education amendments” (p. 257). The participants wrote their essays using Microsoft Word and also provided think-aloud data, which was “recorded during their composition” (p. 258). One of the researchers took on the role of an “engaged observer” (p. 260) throughout data collection. Data were collected through the participants’ “argumentative essays, recorded think-alouds for argumentative essays, literary analysis essays, and recorded think-alouds for literary

analysis essays” (p. 257). The participants in this study appeared to use “technology automatically” (p. 261). Their words and phrases while discussing their writing suggested they had “appropriated and internalized the affordances of technology” (p. 262), including the “non-linear processes and products” (p. 266) of digital writing. Turner and Katic concluded that encouraging non-linear literacy practices, such as those in digital writing using Word software, might influence writing development.

### **Summary of the Review**

This literature review contains reviews of 24 research studies. These studies were found through searches of leading educational databases, using the key words of *writing instruction*, *writing development*, *blogs*, *wikis*, *emails*, *online writing instruction*, *digital texts*, and *traditional literacy*. The studies have been grouped according to the grade range of the participants and then sorted by the form of digital writing researched. The sections of the review are those studies that examine participants in grades one to three (3 studies), in grades four to six (14 studies), in grades seven to nine (4 studies), and in grades ten to twelve (3 studies). Of the 24 total studies, 11 were conducted internationally: two involved participants from Greece, two involved participants from the Netherlands, three had participants from England, one had participants from China, and three involved participants from Australia. The remaining 13 studies were with participants in from the United States. Two studies were conducted in the 1990’s (1993, 1995), and the next one was in 2003. The remainder of the studies were conducted in the last 10 years (2005-2015).

## **Chapter 3: Methodology**

### **Introduction**

To address the research question of the influence that digital writing has on writing development and writing instruction in the traditional paper-based curriculum, an extensive review of the literature was conducted. This chapter addresses the data collection process, the data analysis, and the synthesis. The data collection section describes how the research studies were found for this particular study and what was done to organize the data in the literature review. The data analysis section provides an examination of all the data (research studies) collected and draws connections among common themes and recognizable patterns. The synthesis section summarizes what was found as a result of the data analysis and presents it as findings.

### **Data Collection**

The data for this research study synthesis consists of the 24 research studies found through the data collection process of exhaustively searching the leading educational databases for peer-reviewed research studies. Data were then organized into four categories according to participant grade range: grades one to three, grades four to six, grades seven to nine, and grades ten to twelve. These categories emerged from the research question and from an analysis of the preliminary data. These categories then served as the organizing structure for further data analysis, which is explained in the next section.

### **Data Analysis**

To begin, all collected studies were analyzed and coded to determine categories, codes, and themes for the data. Studies within each category were then analyzed and synthesized to produce new findings. Findings from each category were then further synthesized to produce results related to the research question. The remainder of this section details the analysis process and the results.

### **Participants in grades one to three.**

Of the three studies in this category, one (Merchant, 2003) examines digital writing related to writing instruction, and two (Mills, 2011; Grimes & Warschauer, 2008) examine digital writing related to writing development. The study with the writing *instruction* focus examines the digital writing of e-mail with students in grades two to five (Merchant, 2003). The results indicate that using email as an instructional tool produces increased collaborative writing among pairs of students and increases students' willingness to experiment with their writing (Merchant, 2003). While the Merchant (2003) study was conducted in England, the results are likely to be applicable to American students because the digital writing of e-mail transcends national boundaries. The studies for this grade range with the writing *development* focus examine the digital writing of multimodal writing (Mills, 2011) and computer devices themselves (Grimes & Warschauer, 2008). The study with just third grade students involved writing the same content across multiple digital forms, and concluded that this type of digital writing developed the students' ability to create knowledge and increase text complexity (Mills, 2011). Although this study is Australian, there appears to be no reason why the results are not applicable to American studies again given the worldwide usage of the digital writing technology. The other study in this grade range with the writing *development* focus, and the only study in this category to specifically mention diverse students, examines the school-wide use of laptop computers by students in grades 3 to 8 (Grimes & Warschauer, 2008). Results of this study indicate that students used the laptops primarily for writing and revising papers and for engaging in the writing process, and in turn their writing developed in the areas of length and format (Grimes & Warschauer, 2008). Overall, within this grade range category, there are no studies that looked at blogs, wikis, or software programs, just e-mail, multimodal texts, and laptop use. With only one study examining the impact of digital writing on writing *instruction*, it is too soon to draw any conclusions about that; however, for impact on writing *development*, studies in this category show positive influence in the areas of text complexity, length, and structure, and increasing experience (practice time) with the writing process itself. Two of the studies in the grade 1 to 3 range have participants that include the grade 4 to 6 range; therefore their findings will mesh well with those in the following grade 4 to 6 category.

### **Participants in grades four to six.**

Of the 14 studies in this category, only one examines digital writing related to writing instruction, five examine digital writing related to both instruction and development, and eight examine digital writing related only to writing development. The study with the writing *instruction* focus finds that collaborative digital writing of e-mail during writing instruction transforms the way students in grades four to six write and what they write about, while the e-mail writing itself engages them in written communication (Burnett, Dickinson, Myers, & Merchant, 2006). While the Burnett, Dickinson, Myers, & Merchant (2006) study was conducted in England, the results are likely to be applicable to American students because the digital writing of e-mail transcends national boundaries.

Five studies for this grade range have both a writing *instruction* and writing *development* focus for digital writing; four of those are international, conducted outside of the United States (deVries, vanderMeig, Boersma, & Pieters, 2005; Doult & Walker, 2014; Mills & Exley, 2014; Edwards-Groves, 2011). However, again given the worldwide existence and use of digital writing, there does not appear to be any reason why their results are not applicable to America as well. One study examining the writing of e-mail finds that e-mail for writing instruction with students with learning and behavioral disabilities results in collaboration, engagement, and more equal participation, and results in the development of more reflective writing (deVries, vanderMeig, Boersma, & Pieters, 2005). One study examining the digital writing of blogs with students of diverse socioeconomic status finds that blogs for writing instruction result in an increase in the quality of written responses and development of students' confidence, motivation, and engagement as writers (Myers, 2014). One study examining a collaborative writing learning environment using wikis with non-diverse students finds that wikis for writing instruction result in an increase in the quality and quantity of writing and in students' ability to switch between social and formal writing. The impact on writing development is that the students were highly engaged with the writing process. Two studies for this grade range and focusing on writing *instruction* and writing *development* examine the digital writing of multimodal writing. The study with fourth and fifth grade students of low socio-economic status finds that writing instruction with multimodal writing creating a more controlled and structured classroom environment while developing students' motivation and confidence (Mills & Exley, 2014). The

other study with non-diverse students in grades four to six finds that teamwork through multimodal writing instruction impacts the development of students' process and production of texts (Edwards-Groves, 2011). Analysis of these five studies with dual impact on writing instruction and writing development indicates that instruction positively impacts classroom environment and flexible lesson planning while impacting writing development in the areas of confidence, motivation and engagement, and quality and quantity of writing. That four out of five studies are conducted internationally shows the international interest in the influence of digital writing on writing instruction and writing development.

Of the studies in this category, eight examine digital writing related to writing *development*. For diverse students in grade five, digital writing with blogs appears to develop their writing confidence, motivation, and sense of belonging (McGrail & Davis, 2011). Collaborative digital writing of wikis appears to influence the writing development of English Language Learners (ELLs) (Woo, Chu, & Li, 2013). While the Woo, Chu, and Li (2013) study was conducted in China with ELLs, the results likely apply to ELLs in the United States as well because wikis are worldwide. Digital writing using software programs impacts the writing development of at-risk fourth grade students by adding a higher level of motivation and higher order thinking to their writing (Sinatra, Beaudry, Pizzo, & Gesiert, 1994). For fourth and fifth grade at-risk students, digital writing using software programs on a one-to-one laptop program impacted their writing development by influencing their motivation, confidence, and writing quality (Zheng, Warschauer, & Farkas, 2013). Students with learning disabilities in an upper elementary resource room had their writing development and performance impacted by digital writing in the form of a computer-supported Web-based scaffolding environment (Englert, Wu, & Zhao, 2005). The digital writing of e-books, electronic journals, and online message boards impacts the writing development of non-diverse fifth grade students by increasing their engagement with the writing process (Larson, 2009). The writing development of non-diverse fifth grade students is also impacted and improved through a distance network digital writing environment (Allen & Thompson, 1995). The writing development of multiracial and multinational urban fifth grade students is impacted by projects where students drew on multiple modes of digital writing and thereby shift their writing types, modes, and mediums (Vasudevan, Schultz, & Bateman, 2010). Analysis of these studies into the impact of digital writing on writing

development indicates a positive influence in the areas of collaboration, confidence, motivation and engagement, and the quality of writing.

Overall, within this grade range category, the forms of digital writing studied are e-mail, blogs, wikis, software programs, and mixed/multimodal writing. With studies examining the impact of digital writing on writing *instruction*, positive influence was shown in the areas of collaboration, engagement, and students' willingness to write. With studies examining the impact of digital writing on writing *instruction* and writing *development*, positive influence from using digital writing was shown in the areas of classroom environment and lesson adjustment based on digital-based forms of writing for writing instruction and in the areas of confidence, motivation and engagement, and quality and quantity of writing for writing development. With studies examining the impact of digital writing on writing *development*, positive influences were shown in the areas of collaboration, confidence, motivation and engagement, and the quality of writing. These impacts and influences appear to be positive regardless of whether the participants are non-diverse or diverse, including students with learning disabilities, socioeconomic diversity, ELLs, or at-risk students. Therefore digital writing as an instructional tool appears to positively impact the writing development of all types of students in the grade four to six range.

### **Participants in grades seven to nine.**

Of the four studies in this category, all of them examine digital writing related to writing *development*. The studies examine the digital writing of blogs (Daskalogiannaki, 2012), wikis (Kontogeorgi, 2014), and multimodal writing (Martin & Lambert, 2015; Turner, Abrams, Katic, & Donovan, 2014). The study conducted in Greece focusing on blogs (Daskalogiannaki, 2012) finds that this type of digital writing with ELLs in grade 8 developed the students' engagement and reflection, along with the quality and quantity of writing. Another study conducted in Greece with ELLs examines wiki-based student journals and finds that students' motivation increased while creating an environment for improvement of writing skills (Kontogeorgi, 2014). The results from these two studies can be applicable to American studies with ELLs given the worldwide usage of digital writing through blogs and wikis. Examining multiple forms of writing, one study focusing on digital writing instruction with non-diverse students in grades six to eight and finds that adolescent students have varying needs during digital writing instruction

depending on access and experience with technology (Martin & Lambert, 2015). The other study examining multiple forms of digital writing with nine non-diverse students in grades seven to 12 finds that implementing multiple forms of digital writing produces writers who are able to adopt the conventions of the digital writing form through their self-selected samples of digital writing (Turner, Abrams, Katic, & Donovan, 2014). Overall, within this grade range category, there are no studies that looked at e-mail or software programs, just blogs, wikis, and multimodal writing. Although no studies from this category examine the impact of digital writing on writing *instruction*, the four studies in this category show an impact on writing *development*. The studies show digital writing has a positive influence in the areas of engagement, motivation, reflection, quality and quantity of writing, even writing specifically adapted to the digital form. Two of the studies are conducted internationally in Greece, which shows the international focus on the influence of digital writing.

#### **Participants in grades ten to twelve.**

Of the three studies in this category, one (Manfra & Lee, 2011) examines digital writing related to writing instruction, and two (deSmet, Broekkamp, Brand-Gruwel, & Kirschner, 2011; Turner & Katic, 2009) examine digital writing related to writing development. The study with the writing *instruction* focus examines the digital writing of blogs with low achieving and at-risk learners in grades 11 and 12 and finds that blog-based writing instruction produced greater participation, higher levels of thinking, and met the learning needs for at-risk and low-achieving high school students (Manfra & Lee, 2011). The studies with the writing *development* focus examined the digital writing of software programs. The study with non-diverse tenth grade students finds that having students plan and write an argumentative text with an electronic outline tool improves writing structure and text complexity (deSmet, Broekkamp, Brand-Gruwel, & Kirschner, 2011). Although this study is Dutch, there appears to be no reason why the results are not applicable to American studies given the worldwide usage of the digital writing technology. The other study in this grade range with the writing *development* focus also examines writing texts electronically through Microsoft Word and finds that students seemed to use technology automatically, and in turn their writing developed (Turner & Katic, 2009). Overall, within this grade range category, there are no studies that looked at wikis, e-mails, or

multimodal texts, just blogs and software programs. With the study examining the impact of digital writing on writing *instruction*, positive influence was shown in the areas of participation and higher levels of student thinking. For impact on writing *development*, studies in this category show positive influence in the areas of text complexity and structure.

Figure 1 provides a summary of the data analysis results for types of digital writing studied in each grade range.

**Figure 1: Summary of Data Analysis: Types of Digital Writing Used by Grade Range**

Grade Range	E-mail	Blogs	Wikis	Software Programs	Mixed/Multimodal
1-3	X				X
4-6	X	X	X	X	X
7-9		X	X		X
10-12		X		X	X

This table shows that the most frequently used forms of digital writing appear to be e-mail, blogs, wikis, software programs such as Microsoft Word, and writing that includes mixed forms or multimodal writing. It also shows that digital writing in all five of these forms appears to have the greatest influence on students in grades 4 to 6.

### Synthesis

The results emerging from the analysis of each of the four categories can now be synthesized (combined) into findings that address the research question for this study. Figure 2 details the influence that the forms of digital writing have based on grade range and findings.

**Figure 2: Digital Writing Influence by Grade Range**

<b>Grade Range/ Influence</b>	<b>E-mail</b>	<b>Blogs</b>	<b>Wikis</b>	<b>Software Programs</b>	<b>Mixed/ Multimodal</b>
1-3 Writing instruction	Collaboration Willingness to write	-----	-----	-----	-----
1-3 Writing development	-----	-----	-----	Length Structure	Text complexity
4-6 Writing instruction	Collaboration Engagement Willingness to write	Engagement	Switch between social and formal writing Engagement	-----	Controlled and structured environment Adjustment of lessons
4-6 Writing development	Reflection	Quality Confidence Motivation	Quality Quantity Collaboration	Quality Confidence Motivation	Quality Engagement Confidence Motivation
7-9 Writing instruction	-----	-----	-----	-----	-----
7-9 Writing development	-----	Quality Quantity Engagement Reflection	Motivation	-----	Ability to adopt conventions of digital writing
10-12 Writing instruction	-----	Participation Higher levels of thinking	-----	-----	-----
10-12 Writing development	-----	-----	-----	Structure Text complexity	-----

An analysis of the data in Figures 1 and 2 shows that implementing digital writing throughout the elementary and secondary grade levels does have an influence on writing instruction, writing development, or both. The synthesis of the analysis produces five findings. The first is that the most frequently used forms of digital writing appear to be e-mail, blogs, wikis, software programs such as Microsoft Word, and writing that includes mixed forms or multimodal writing. A second finding is that digital writing in all five of these forms appears to have the greatest influence on both writing instruction and development on students in the grades 4 to 6 range. The most frequent influence on writing instruction is engagement, and on writing development are quality, confidence, and motivation from most of the five forms. These results show that the

most researched grade range is 4 to 6, which may be because traditionally students at that developmental stage stop *learning* to read and write, and start reading and writing to learn.

Another finding relates to the influence of digital writing on writing instruction. The synthesis shows digital writing used for instruction in grades 1 to 6 and again in high school, but no studies were conducted for middle school grades 7 to 9. This lack of research does not mean that digital writing is not used for writing instruction at this grade level, but it does mean that for some reason, researchers did not study digital writing in those grades. The existing research results show that the influence of digital writing on writing instruction for grades 1 to 6 is primarily collaboration for writing and willingness to write, but by grades 10 to 12, the influence of digital writing appears to be on higher-level thinking. Therefore, a third finding of this study is that the influence of digital writing on writing instruction becomes more complex based on grade range by moving from basic influences such as the willingness to write in grades 1 to 6 to complex influences such as higher-level thinking in grades 10 to 12.

The fourth finding relates to the influence of digital writing on writing development. The synthesis shows digital writing used for writing development at every grade range from 1 to 12, especially between grades 4 and 9. Analysis indicates that the influence of digital writing on writing development of students in grades 1 to 3 and 10 to 12 appears to be primarily on developing knowledge of text structure and text complexity. In contrast, the influence of digital writing on writing development of students in grades 4 to 9 appears to be primarily on motivation to write, engagement with the writing process or event, and reflection on the act of writing. Therefore, a fourth finding of this study is that the influence of digital writing on writing development of students at the elementary and high school level is for grammar and text structure, while at the middle school level the influence is for personal development as a writer.

A fifth finding is that digital writing has a positive influence on both writing instruction and writing development for diverse students including students with learning disabilities, socioeconomic diversity, ELLs, and at-risk students. The synthesis shows that digital writing in different forms was implemented with diverse students at every grade range from 1 to 12, especially between grades 4 and 6. Therefore, digital writing appears to be viewed by researchers as an instructional tool to benefit diverse, struggling and at-risk students.

## **Chapter 4: Results and Application**

### **Results of the Review**

After completing a review of the literature to determine what research has been conducted to date on the influence of digital writing on writing development and writing instruction, the researcher has determined five key findings from this synthesis. The first finding is that the most frequently used forms of digital writing appear to be e-mail, blogs, wikis, software programs such as Microsoft Word, and writing that includes mixed forms or multimodal writing. A second finding is that digital writing in all five of these forms appears to have the greatest influence on both writing instruction and development on students in the grades 4 to 6 range. A third finding is that the influence of digital writing on writing instruction becomes more complex based on grade range by moving from basic influences such as the willingness to write in grades 1 to 6 to complex influences such as higher-level thinking in grades 10 to 12. The fourth finding of this study is that the influence of digital writing on writing development of students at the elementary and high school level is for grammar and text structure, while at the middle school level the influence is for personal development as a writer. The fifth finding appears to be that digital writing appears to be viewed by researchers as an instructional tool to benefit diverse, struggling and at-risk students.

### **Application of Results to a Professional Development Project**

The findings from this study have significance to classroom teachers. Knowing these findings can assist teachers in knowing about various forms of digital writing and the influence that the forms of digital writing have on writing development and writing instruction in traditional paper-based curriculum. These findings can also assist teachers in planning a curriculum that incorporates digital writing appropriate for the grade level they teach. Sharing the findings from this research synthesis with teachers is professional development, and the most appropriate form of professional development for sharing this new knowledge is a Google Site.

## **Design of Professional Development Project**

The design of this professional development project will be in the form of a Google Site. This professional development Google Site is intended for teachers in grades one through twelve, from elementary to high school, because the research that supports this professional development has been conducted with students from grades one through twelve. The Google Site will contain a one page document for each of the grade ranges found in this study to have been addressed by research literature. Each grade range page will include information on the types of digital writing studied for that grade range and on the influence of that digital writing on the writing instruction and writing development of students in that grade range. The details on each page per grade range of the Google Site are the details displayed in Figure 1 and Figure 2 from the Synthesis section of Chapter 3. The Google Site design individualizes the information to teacher grade level, while also allowing all teachers the possibility of seeing the forms of digital writing used in the grade level above and below their own. The Google Site also allows teachers 24-hour access, so the information is readily available as a resource in their own professional development library. Google Sites are a free resource, so this form of professional development will be available to school districts at no cost. Google Sites does provide space for comments, so teachers do have the ability to respond to, question, or comment on the information. This ability provides an opportunity for teachers to collaborate with one another. Teachers will learn about the existence of this Google Site through the administrators and literacy specialists in their school district and will be granted access by having the Google Site shared with their school e-mail address.

### **Literacy coaching goals and objectives.**

The goal of this professional development project presented through Google Site is to support teachers who would like to incorporate digital writing into their curriculum. To address this goal, the following learning objectives provide clarification and description. The first objective of this Google Site is that participants will learn about the research-based types of digital writing and the influence that digital writing has on writing instruction and writing development across grade ranges, and specifically on their own grade. The second objective is

that participants will be able to collaborate and discuss the topic of digital writing with one another. The Google Site provides a space for teachers to share their experiences with digital writing, pose questions, and write comments. The Google Site will be a professional development reference for teachers to use when planning their digital writing instruction.

### **Proposed audience and location.**

This proposed professional development project is intended for an audience of classroom teachers in grades one through twelve. School districts, specifically administrators and the literacy specialist, will be given the link to the Google Site and the link can be dispersed to teachers. To access the site, participants only need the link; there will be no password required for this site. The information for this professional development will be copyrighted but archived on the Google Site and will be accessible at any time.

### **Proposed project format and activities.**

The format of this proposed professional development project is a one page informative document per grade range on a Google Site. Each of the four grade ranges studied will have its own page on the site (see Appendix A). First, the document will show the section of the table in Figure 1 and Figure 2 from the Synthesis section of Chapter 3 that aligns with the specific grade range. There will also be links to some of the original research gathered for this research synthesis on each grade range page. This research may be helpful to teachers because some of the studies describe with explicit detail the types of digital writing used and how it influenced writing instruction and/or writing development. In addition to the document pages, activities for participants in this professional development project include the opportunity to respond or enhance the content by adding their own comments on the site pages, thus promoting and creating collaboration among colleagues and other professionals.

**Proposed resources for project.**

Proposed resources for this professional development Google Site include online Internet access and a computer (or similar technology device) for participants. Because Google Sites are a free resource, this format offers a cost-effective form of professional development for school districts. In order to most efficiently provide the Google Site to teachers, the link itself will be distributed among local school district administrators and literacy specialists. They will be granted access through their district as the Google Site will be shared with them through their school e-mail address.

**Proposed evaluation of project.**

To evaluate the effectiveness and usefulness of the content and format of the Google Site for professional development as well as to determine whether the project objectives have been met, the last page of the site will contain a link to an online survey (see Appendix B) through Google Forms. Participants will be asked to measure the effectiveness of the Google Site and provide their feedback in regards to the site's usefulness for their own professional development. The survey will also seek to determine if the information was clearly presented, if the types of digital writing were explained appropriately and effectively, and if the educators would personally use these types of digital writing to support their own students' writing instruction or writing development in traditional paper-based curriculum.

**Project Ties to Professional Standards**

This professional development project ties to the *Professional Standards* of the International Literacy Association (ILA) because their Standard 6 requires classroom teachers to “recognize the importance of, demonstrate, and facilitate professional learning and leadership as a career-long effort and responsibility” (IRA, 2010, p. 15). Classroom teachers who voluntarily use this Google Site will meet this standard by demonstrating participation in professional development as a professional responsibility. This proposed form of professional development project also ties to the following New York State Teaching Standard (NYSED, 2011): Teaching

Standard III: Instruction Practice, Element III.1: teachers use research-based practices and evidence of student learning to provide developmentally appropriate and standards-driven instruction that motivates and engages students in learning. Through this individualized and self-directed form of professional development, teachers will be using research-based practices to determine the types of digital writing that will work best in their classroom. Teachers will also see on the Google Site the influence that the different forms of digital writing had on the writing instruction and writing development of students in that grade range. In addition to these standards, this form of professional development ties to the New York State Common Core Learning Standards (CCLS). The CCLS standards within the “writing” area of literacy include a digital component at every grade level. For example, W.1.6 and W.2.6 state, “with guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers” (CCLS, 2015, p. 26). W.4.6 states, “with some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others” (CCLS, 2015, p. 29). This required digital component of the writing standard continues through twelfth grade. Applying the findings will enable teachers to support student learning within this literacy area and guide students to meet the objective of the specific CCLS standards.

## **Chapter 5: Discussion and Conclusion**

### **Overview of Study and Findings**

In today's society, digital (technology-based) writing is becoming prevalent especially among children and youth; they in turn bring many forms of digital writing into the classroom. On the other hand, the National Assessment of Educational Progress (NAEP) reports in 2007 that only one third of eighth graders write at or above proficiency level on paper-based tests. This low proficiency level in school-based paper-based writing and students' increasing use of digital writing creates a problem for teachers and school administrators about how to respond to students' increasing use of digital writing. To address this problem from the perspective of a literacy specialist, this research study asks the question, "how does digital writing influence writing development and writing instruction in the traditional paper-based curriculum?" To answer that question, a literature review and research synthesis have been conducted and have produced five findings. First is that the most frequently used forms of digital writing appear to be e-mail, blogs, wikis, software programs such as Microsoft Word, and writing that includes mixed forms or multimodal writing. The second is that digital writing in all five of these forms appears to have the greatest influence on both writing instruction and development on students in the grades 4 to 6 range. Third is that the influence of digital writing on writing instruction appears to become more complex as the grade level increases, with grades 1 to 6 influencing willingness to write and grades 10 to 12 influencing higher-level thinking. The fourth finding is digital writing appears to influence the grammar and text structure of writing development for elementary and high school students but influences personal development as a writer for middle school students. The fifth finding appears to be that digital writing is seen by researchers as an instructional tool to benefit diverse, struggling and at-risk students. These findings about the influence of digital writing on writing development and writing instruction then form the basis of a professional development project presented on Google sites for Kindergarten to grade 12 classroom teachers.

### **Significance of the Findings**

These findings are significant to teachers and educators because they contribute new knowledge about the influence of digital writing on writing instruction and writing development in the traditional paper-based curriculum. This study finds that the most frequently used forms of digital writing appear to be e-mail, blogs, wikis, software programs such as Microsoft Word, and writing that includes mixed forms or multimodal writing; that digital writing in all five of these forms appears to have the greatest influence on both writing instruction and development on students in the grades 4 to 6 range; that the influence of digital writing on writing instruction becomes more complex as grade levels increase; that the influence of digital writing on writing development of students at the elementary and high school level is for grammar and text structure; and that digital writing is seen by researchers as an instructional tool to benefit diverse, struggling and at-risk students. These findings indicate areas of classroom influence by digital writing. They are also significant to the field of literacy because they provide a summary of research to date including the types of digital writing studied, and they also show gaps and limitations in the existing research.

### **Limitations of the Findings**

The findings for this study do have limitations. One is that they are based on the existing research, and existing research into multiple types of digital writing has proven to be somewhat scarce. Research has only been found for five types of digital writing. In addition, the majority of the research gathered focused on students in grades four through six. Therefore, although research has been conducted at various grade levels, the low number of specific studies in the lower (grades 1 to 3) and upper (grades 7 to 9, 10 to 12) grade ranges has placed a limitation on the synthesis results. As time passes, perhaps more empirical research will be conducted in each of the grade ranges in order to provide more information for each grade range.

### **Conclusion: Answer to the Research Question**

The research question for this research study is, how does digital writing influence writing development and writing instruction in the traditional paper-based curriculum? After conducting this study and performing a research synthesis, this researcher has determined five findings: that the most frequently used forms of digital writing appear to be e-mail, blogs, wikis, software programs such as Microsoft Word, and writing that includes mixed forms or multimodal writing; that digital writing in all five of these forms appears to have the greatest influence on both writing instruction and development on students in the grades 4 to 6 range; that the influence of digital writing on writing instruction becomes more complex based on grade range by moving from basic influences such as the willingness to write in grades 1 to 6 to complex influences such as higher-level thinking in grades 10 to 12; that the influence of digital writing on writing development of students at the elementary and high school level is for grammar and text structure, while at the middle school level the influence is for personal development as a writer; and that digital writing is seen by researchers as an instructional tool to benefit diverse, struggling and at-risk students. Together these findings provide an answer to the research question. Digital writing influences writing development in the traditional paper-based curriculum through grammar and structure in elementary and high school and through personal development as a writer in middle school. Digital writing influences writing instruction in the traditional-paper based curriculum through basic influences such as the willingness to write in grades 1 to 6 to more complex influences such as higher-level thinking in grades 10 to 12.

### **Recommendations for Future Research**

The limitations of the findings of this research provide a basis for these recommendations for future research. The first recommendation is for more research that explores this topic of the influence of digital writing on writing development and writing instruction. Specific studies that would make contributions to this area are those that examine the lower and upper grade ranges. Another recommendation is to research additional types of digital writing and whether they influence writing development and writing instruction in ways similar to the results of this study.

A third recommendation is for studies that explicitly discuss the traditional paper-based curriculum including the paper-based format of standardized tests.

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## **Appendix A: Format of Professional Development**

### Sample Page for Google Site—Grade 4

Figure 1: Summary of Data Analysis: Types of Digital Writing Used by Grade Range

Figure 2: Digital Writing Influence by Grade Range (section of chart for grades 4-6)

Types of digital writing used

Links to original research gathered

Participant collaboration--comments, responses, and questions

[Note: Google Sites allows participants to comment on the bottom of each Site page. These comments are able to be viewed by all users, thus making the Google Site interactive.]

## **Appendix B: Evaluation of Professional Development**

### Google Forms Evaluation Survey

1. How accessible was this form of professional development?
2. How often do you think you will return to this Google Site?
3. What did you find most and least helpful about this Google Site form of professional development?
4. If you could change anything in the formatting of the presentation, what would it be?
5. Were the types of digital writing explained appropriately and effectively?
6. As an educator, have you personally used these types of digital writing in your classroom?  
How do your results compare to the information on this site?

OR

If you have not previously used a form of digital writing with your students, would you be willing to try now that you have read this information?

Suggestions/Comments: