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REORIENTING WRITING IN THE 21ST-CENTURY CLASSROOM: A MIXED METHODS STUDY OF HIGH SCHOOL STUDENTS’ EXPERIENCES USING DIGITAL WRITING TOOLS TO SUPPORT THE WRITING PROCESS

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DEDICATION

To my parents, Jim and Mary, who have always seen the best in me even when I couldn’t find it in myself. To my husband, Darren, and my entire family for supporting me as I went through this Herculean task. To my circle of trust, for catching me whenever I stumbled. To Mom, thanks for encouraging me to start this journey. I just wish you were here to see me finish.
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Not only would I like to thank each of my committee members for their guidance, expertise, and feedback through all the benchmarks of this project, but I would also like to express my gratitude to all of my professors who encouraged me along the way. I would like to thank my committee chair, Dr. Fatih Ari, for helping me comprehend the math of it all. Of course, I would like to thank Dr. Michael Grant for reminding me that sometimes it is best to allow things to marinate, providing a kind word when I needed it, and always liking my Tweets. #cohortzoolander

Also, I would like to thank the members of Cohort Zoolander, especially my writing group, for endless support, laughter through the tears, and affirmation. This final stretch would not have been possible without you.

Finally, I would like to thank my students, past and present, for always keeping it real. Without them, none of this would have been possible.
ABSTRACT

The purpose of this action research study was to describe students’ experiences using digital writing tools to support the different stages of the writing process in Honors-level English classes at a large suburban public high school in the southeastern United States. Reports from the writing section of the Scholastic Assessment Test (SAT) reveal that writing scores for college-bound seniors declined by 15 points between 2005 and 2016. Even though students use social media tools for daily communication, some studies suggest students fail to make the connection between digital tools they use every day and the potential use of digital tools for writing. This convergent parallel mixed methods study examined three areas: 1) students’ attitudes toward using digital writing tools during different stages of the writing process, 2) how students utilized digital writing tools to support different stages of the writing process, and 3) factors that influenced students’ utilization of digital writing tools.

During the first phase, 58 students completed a survey assessing their writing and technology skills, describing frequency of digital tool use, identifying types of digital writing tools used, and revealing their attitudes about using digital writing tools. This survey yielded quantitative data as well as demographic information. During the next phase, initial survey information identified potential interview candidates with differing levels of writing and technology skills. During the third phase, a purposive sample of eight participants was interviewed, and information from these interviews helped focus the creation of questions for the student essay reflection questions used during the fourth
phase. During the fourth phase, students completed reflections about their use of digital writing tools after major writing assignments. Qualitative data stemmed from an open-ended survey question, interview information, and student essay reflections. Qualitative data were analyzed using the inductive analysis process to reveal themes across data sources. At the end of the coding process, five persistent themes evolved: 1) purpose for using digital writing tools, 2) influences on the writing process, 3) benefits of using digital writing tools, 4) challenges of using digital writing tools, and 5) discovery of digital writing tools.

Findings indicated types of digital writing tools used are influenced by the student’s purpose for digital tool use, students used different tools during each stage of the writing process or to meet the requirements of the assignment, students utilized digital writing tools because the tools helped improve their writing while aiding efficiency, students did not use digital writing tools if the tool lacked consistency, or they did not know how to use the tool, and students searched for a digital tool to use on their own, but more often, students were influenced to use a digital tool.

Implications from this study suggested potential recommendations for incorporating instruction about digital writing tools used in the writing process in teacher preparation programs as well as providing more differentiated professional development opportunities about digital writing tools for current teachers. Another implication suggested opportunities for future research by teachers or researchers interested in the utilization of digital writing tools during the writing process.
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CHAPTER 1
INTRODUCTION

National Context

In 2003, the National Commission on Writing issued a call for a writing revolution. They challenged policymakers to create a nation of writers after findings indicated that college freshmen could not “write well enough to meet the demands they face in higher education and the emerging work environment” (p. 16). Fast forward eight years and the National Assessment of Educational Progress (NAEP) writing assessment reported that 52% of seniors performed at the basic level, 24% performed at the proficient level, and only 3% of seniors performed at the advanced level (National Center for Education Statistics, 2012, p. 2). The landscape surrounding the need for a writing revolution has changed very little. In 1998, the NAEP statistics also found that 78% of students were writing at basic levels and producing “relatively immature and unsophisticated” prose, while only 1% of high school seniors were writing at advanced levels (National Commission on Writing, 2003, p. 17). Reports from the writing section of the Scholastic Assessment Test (SAT) reveal that this trend is continuing with college-bound seniors. Between 2005 and 2016, the average writing score for high school seniors decreased by 15 points (U.S. Department of Education, 2018).

The emphasis on high-stakes testing has negatively impacted writing instruction. A focus on more formulaic timed writing deemphasizes the writing process because students are required to complete a final draft under a time constraint (Applebee &
Langer, 2011; National Commission on Writing, 2003). From a content perspective, students are not consistently writing at length or writing for the extended periods needed to allow them to explore connections through critical thinking and analysis (Applebee & Langer, 2011; Gallagher, 2017). A study by Applebee and Langer (2011) reported that on average, during a fifty-minute class, students received “just over three minutes of instruction related to explicit writing strategies, or a total of 2 hours and 22 minutes in a nine-week grading period” (p. 21). This amount of time is remarkably insufficient because instruction in the writing process can also have a positive impact on students’ reading skills and overall literacy achievement (Applebee, 1984; Biancarosa & Snow, 2006; Graham & Herbert, 2010; National Commission on Writing, 2003). Additionally, a survey of teachers involved with the National Writing Project indicated that teachers find getting students to think critically about the writing process is a challenge (Purcell, Buchanan, & Friedrich, 2013).

The use of technology to aid in the improvement of writing has been most beneficial with the use of tools that foster collaboration (Applebee & Langer, 2011; Johnson, 2016). However, while most national writing assessments do not utilize collaborative digital writing tools, current writing assessments do offer students access to technology such as dictionaries, thesauruses, and annotation tools. The Nation’s Report Card on Writing revealed that while students who used digital writing tools such as the thesaurus scored higher, only 15% of seniors chose to use the thesaurus two or more times (National Center for Education Statistics, 2012, p. 3). Although Purcell et al. (2013) found that 92% of Advanced Placement (AP) teachers agreed that effective writing skills were fundamental to student success, overall student writing performance continues to
decline even as student access to technology increases (Beck, Llosa, Black, & Trzeszkowski-Giese, 2015; Santelises & Dabrowski, 2015; Gallagher, 2017). Students need to strengthen their writing skills because writing helps students make sense of their learning, establish connections with previously learned concepts, and communicate with others (Coskie & Hornof, 2013; Graham & Herbert, 2010; Jones, 2016; National Commission on Writing, 2003).

The nationwide writing struggle also has monetary disadvantages for students as well as employers. More students enrolling in post-secondary institutions are requiring remedial courses to supplement weak skill areas such as writing (Fulton, 2010), and these extra courses are costing students about $1.3 billion nationwide (Jimenez, Sardrad, Morales, & Thompson, 2016). Since most businesses consider writing a gateway skill for employment as well as promotion, the need for students to be adept at writing is paramount, especially since providing remediation for employees cost corporations almost $3.1 billion every year (National Commission on Writing, 2004).

**Local Context**

The school in the study is a comprehensive high school with an enrollment of 2335 students and a diverse student population (SC Department of Education, 2017). Only 24.4% of the student population is enrolled in an Advanced Placement (AP) class (SC Department of Education, 2017), and 75.6% of students pursue post-secondary education (SC Department of Education, 2017). By 2021, the school’s goal is to increase student enrollment and diversity in AP courses by offering a more extensive selection of AP courses (County Schools, 2017). To help scaffold that process, the school has
implemented an AP Academy and actively recruits students from traditionally underrepresented populations to take AP classes.

Since AP courses are writing-intensive, one step to improve the overall scores for AP English classes consisted of a vertical teaming approach. The vertical teaming approach allowed English teachers from all grade levels to collaborate and identify common writing expectations for all English classes. These common writing expectations focused on preparing students for the more challenging writing demanded by AP classes or dual-placement English 101/102 courses that students may take during their junior or senior years of high school. The English department also implemented the use of common writing rubrics modeled after the ACT scoring rubric and the AP English scoring rubric to attempt to align writing expectations across grade levels. The school is also participating in the district’s one computer for every student initiative, which allows every student access to various digital writing tools used during the writing process.

Per the curriculum planning guides developed for all high schools, the use of district-mandated digital tools in the English classroom primarily focused on informational text reading skills and grammar skills. One digital tool used was No Red Ink. This tool provided students adaptive instruction on specific grammar, usage, mechanics, and style problems. The district’s blended lesson plan template encouraged teachers to incorporate digital tools during teacher-directed small group instruction. Students were also encouraged to use various digital tools during the creation and collaboration rotation time of the blended learning lesson. For students in an English class, the integration and purposeful use of digital writing tools could provide an opportunity for writing improvement especially in connection with the writing process.

**Statement of the Problem**

Producing high school graduates capable of effective writing continues to be a nationwide struggle even though the National Commission on Writing first issued the demand for a writing revolution in 2003. Stakeholders agree that students need more than fundamental communication skills to be successful in higher education and the workplace (Kivunja, 2014; Partnership for 21st Century Skills, 2010; Sweeny, 2010; Santelises & Dabrowski, 2015; Trilling and Fadel, 2009). Even though all students in my class have access to their own digital devices and multiple digital tools at their fingertips, students are not effectively employing digital writing tools to aid them during the writing process. Students in my classes fail to see writing as a process where “writers learn to move back and forth through different stages of writing, adapting those stages to the situation” (Council of Writing Program Administrators, National Council of Teachers of English, & National Writing Project, 2011, p. 8). However, technology can provide students access to tools that make the writing process more fluid and less tedious (Applebee & Langer, 2013; Ghahri, 2015; Nobles & Paganucci, 2015; Pearman & Camp, 2014). Even so, many students fail to make the connection between the social media digital tools they use every day for communication and the potential use of digital tools for academic writing (Johnson, 2016; Moore et al., 2016; Sharp, 2014).
Purpose Statement

The purpose of this action research study was to describe students’ experiences using digital writing tools to support the different stages of the writing process in Honors-level English classes at a large suburban public high school in the southeastern United States.

Research Questions

This study addressed the overall research question: What are Honors-level English students’ experiences with using digital writing tools to support different stages of the writing process? Specifically, this study answered the following three sub-questions:

1. What are Honors-level English students’ attitudes toward the use of digital writing tools during the different stages of the writing process?
2. How and to what extent do students utilize digital writing tools in an Honors-level English class to support different stages of the writing process?
3. What influences students’ utilization of digital writing tools in an Honors-level English class?

Researcher Subjectivities & Positionality

I chose to major in English in college because I love the power of the written word, but as educators, I believe our primary responsibility is to create literate citizens for the future. While the definition of literacy has always involved competency in the skills of reading and writing, the National Council of Teachers of English (2013) updated their definition of literacy to include “proficiency and fluency with the tools of technology” (p. 1) as well as the ability to “synthesize multiple streams of simultaneous information” (p.
1. As the middle child whose parents only received a high school education, the value of literacy was stressed at an early age in our rural middle-class home. Although both my parents worked, my older sister would take my younger brother and me to the city to visit the library. The creamy coffee-beige shelves of the children’s section were one of my favorite places to visit every two weeks to check out the adventures of Alec Ramsey and his black stallion or the ramblings of Ramona Quimby. As a child, I annotated in my books, and the best gift was a book. As an adult, I still prefer to feel the pages of a book between my fingertips, review marginalia scribbled in the pages, and see the well-worn spine of an old favorite that I have read many times. While I type my essays using a laptop and I love the capability of Microsoft Word to ease the revision process, I still begin essays by scrawling my thoughts on paper because that is how I learned to craft an essay. However, I have to be cognizant of the fact that many of my students may have very different and often negative attitudes surrounding writing and the writing process (Gorlewski, 2016; Graves, 1985; Ito et al., 2008; Sanders-Reio, Alexander, Reio, & Newman, 2014).

As the researcher, I examined the impact of the student use of digital writing tools in my classroom. As a member of the ever-changing microcosm of my classroom, my perspective as an insider had both positive and negative implications (Herr & Anderson, 2005). While my relationship with my students and the nurturing climate created in my classroom afforded a certain level of implied trust between the students and me, I was also aware of the potential bias and self-reflection about my teaching practices associated with an insider perspective (Herr & Anderson, 2005). During the interviews, students were comfortable speaking honestly with me; however, they also watched my face for
any justification of their response because they wanted to make sure I approved of the response (Herr & Anderson, 2005). Therefore, I was cautious not to allow my position of authority as the teacher to influence any student responses (Herr & Anderson, 2005). The study did not negatively impact student grades, and I only interviewed students who were comfortable with the process.

This research was addressed through the lens of the pragmatic worldview because it offered the researcher “freedom of choice” (Creswell, 2014, p. 39) and an understanding that the “truth is what works at the time” (Creswell, 2014, p. 40). A single reality manifests within each individual’s unique interpretation of the reality (Mertens, 2010). Therefore, an ontological consideration of my research into a student’s choice of digital writing tools during the writing process was each student’s view of the current writing reality (Mertens, 2010). Student interactions with writing frequently changed throughout the study. The useful truth was the one that revealed how digital writing tools influenced the writing process. From an epistemological lens, Crotty (1998) suggests this knowledge is the question or problem that drives the need to know, and the research process reveals this relationship. Therefore, methodology answers the question of how the “inquirer can find out whatever he or she believes to be known” (Guba & Lincoln, 1994, p. 108).

From a pragmatic perspective, the methodology depended on what worked for the situation. Some circumstances required more quantitative data such as surveys, while other situations called for more qualitative types of data, such as interviews. This mixing of data sources resulted in the choice of a mixed methods design for the study. From an axiological perspective, I was aware of any subjective attitudes and values that could
impart during the research process because, as Mertens (2010) advises, the values and politics of the researcher influence the pragmatic paradigm outcome.

The landscape in which my students must live, work, and raise their families will continue to change at a rapid rate as technology and the demands for a literate workforce increase. Students should not leave my English class and have to pay for remedial English courses at a post-secondary institution or not be able to complete a job interview because their writing skills are substandard. If that happens, education has failed them. Becoming fluent with all the available digital writing tools to enhance their writing process will allow students a stronger foothold on college and career-ready skills such as critical thinking and communication (Center for Community College Student Engagement, 2016; Foster & Russell, 2002; Partnership of 21st Century Skills).

Katherine Yancey (2009), former president of the National Council of English Teachers, asserted that writing was not as historically respected because “through reading, society could control its citizens, whereas through writing, citizens might exercise their own control” (p. 2). If all students do not successfully cement a strong foundation in the skills that will make them successful in life and the skills that are necessary for them to advocate for their rights as citizens, then what is the purpose of education?
Definition of Terms

Advanced Placement: Advanced Placement courses are academically rigorous college-level high school classes that offer students opportunities to earn college credit if students score between a three and a five on the international exam for that course (College Board, 2017).

Digital Writing Tools: Digital writing tools are web-based resources designed to “engage, motivate, and enhance the classroom writing environment” (McKee-Waddell, 2015, p. 27) while providing opportunities for students to engage in all facets of the writing process (Nobles & Paganucci, 2015). Students have access to numerous tools that can be implemented in the classroom setting for enhancing writing and learning (Jones, 2016; Olthouse & Miller, 2012). Digital writing tools such as research tools, translation tools, voice typing tools, Grammarly, graphic organizer tools, citation tools, comment tool, word count tool, dictionary tool, thesaurus tool, and SAS writing reviser were accessible for each step of the writing process.

Literacy: Literacy was defined following the National Council of Teachers of English (2013) updated definition of literacy to include competent reading and writing skills in addition to “proficiency and fluency with the tools of technology” (p. 1) as well as the ability to “synthesize multiple streams of simultaneous information” (p. 1).

No Red Ink: No Red Ink is a grammatically focused online tool that uses interest-based curriculum and adaptive practice combined with immediate feedback to improve students’ grammar.
**21st-Century Literacy**: 21st-century literacy encompasses all aspects of communication, including reading, writing, viewing, listening, and speaking as well as the digital modes of those skills (Sweeny, 2010).

**Writing**: Writing is a “complex, multifaceted, communication that is accomplished in a variety of environments, under various constraints of time, and with a variety of language resources and technological tools” (National Center for Education Statistics, 2012, p. 4). It is also a representation of language and thought that is “an essential and visible aspect of identity” (Gorlewski, 2016, p. 160).

**Writing Process**: The writing process is a continual cycle that is affected by individual experiences as well as the social interaction that occurs during the writing process (Flower & Hayes, 1981; DeSmet, Brand-Gruwel, Leijten, & Kirschner, 2014; Graves, 1985; Murray, 1972). For the purpose of this study, editing was acknowledged as part of the revision stage, and publishing was added as an additional stage (SC College and Career-Ready Standards, 2018). Students employed a recursive writing process that included planning/organizing (prewriting stage), writing/rewriting (writing stage), editing/revision, and publishing (SC College and Career-Ready Standards, 2018). Reflection occurred when students completed essay reflections.
CHAPTER 2

LITERATURE REVIEW

The purpose of this action research study was to describe students’ experiences using digital writing tools to support the different stages of the writing process in Honors-level English classes at a large suburban public high school in the southeastern United States. This study addressed the overall research question: What are Honors-level English students’ experiences with using digital writing tools to support different stages of the writing process? Specifically, the study answered the following three sub-questions:

1. What are Honors-level English students’ attitudes toward the use of digital writing tools during the different stages of the writing process?
2. How and to what extent do students utilize digital writing tools in an Honors-level English class to support different stages of the writing process?
3. What influences students' utilization of digital writing tools in an Honors-level English class?

Methodology for the Literature Review

The literature review was conducted with keyword searches using the Educational Resources Information Center (ERIC) database and the Education Source database combined. Keyword searches were performed on variables contained in the research questions as well as underlying theories essential to defining components of the variables. The searches used the following words and word combinations: digital writing tools, digital literacy, student perception of writing, student perception of digital writing tools,
multimodal composing writing in high school, writing theory, 21st-century literacy, 21st-century skills, and technology appropriation model. In addition to searching these databases, I also reviewed prominent journals in the fields of education, English education, and educational technology that have published studies on digital writing tools, digital writing tools, and writing in the high school classroom. The journals reviewed were as follows: *Computers and Composition, Journal of Adolescent and Adult Literacy, Journal of Literacy Research*, and *English Journal*.

After retrieving articles, I read the articles to determine if they were significant to the study. To be included in the study, articles had to focus on writing, digital writing tools, 21st-century literacy, multimodal composing, writing theory, and/or 21st-century skills. Studies referred to in the articles had to be conducted in a school setting. The articles had to be published within the last seven years unless the articles were considered seminal works. Most of the foundational works focused on writing theory and 21st-century skills.

In many situations, the reference sections of the articles provided additional sources to investigate. This literature review section begins with an extensive overview of the changing face of 21st-century literacy, including the influence of writing on 21st-century skills, the impact of students' lack of 21st-century skills on career and college readiness, and the role technology plays in preparing students for life after high school. The next section of the literature review focuses on the benefits and drawbacks of using digital writing tools during the writing process. The literature review concludes with an overview of student and teacher perceptions about the use of digital writing tools during the writing process.
Changing Face of Literacy in the 21st Century

Literacy has evolved from a simple description limited to reading and writing to a more complex definition involving multiple facets of the communication process such as reading, writing, speaking, viewing, listening, and technology application (ISTE, 2016; NCTE, 2013; Sweeny, 2010). Instead of just focusing on reading and writing, students must also incorporate digital communication tools as part of the literacy process. To understand how literacy has changed in the 21st century, it is essential to (a) define 21st-century literacy, (b) define the writing process in the context of the 21st century, (c) understand the crucial role writing plays in the 21st century, and (d) review claims that students lack the 21st-century skills needed for success in post-secondary education as well as the workplace.

Defining 21st-Century Literacy

The definition of literacy has expanded to include all communication skills, including elements of critical thinking and problem-solving. Literacy in the 21st-century involves all aspects of communication, including reading, writing, viewing, listening, and speaking as well as the digital modes of those skills (Sweeny, 2010). However, Kivunja (2014) argues that 21st-century literacy is more heavily defined by critical thinking and problem-solving skills that students need to use technology to enhance communication. Learners need to be able to determine which tool to choose based on the needs of the situation.

Trilling and Fadel (2009) assert that current literacy requires students to use technology as a tool not only for reading and writing but also as a tool for creating information through research. Technology is an integral component of the research
process. In 2016, the International Society for Technology in Education (ISTE) broadened standards for students. It included that students should be able to "communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats, and digital media appropriate to their goals." The definition outlined by ISTE (2016) best defines literacy for this research because 21st-century literacy has evolved to include all communication skills, including technology as well as critical thinking and problem-solving skills learners need to apply the digital writing tools in the appropriate context.

**Defining the Writing Process**

The writing process is a continual cycle affected by individual experiences as well as social interaction that occurs during the writing process. Murray (1972) argues that the writing process is simply the "process of discovery through language" (p.12). This discovery process consists of three main stages: prewriting, writing, and revision (Murray, 1972). However, these stages are not part of a linear model because writing is a reiterative process where different stages of writing can happen at any time during the writing experience (Flower & Hayes, 1981; DeSmet et al., 2014). Therefore, prewriting or revision could occur at any point or reoccur as the writer works through the stages of writing. Denecker (2013) asserts that in-depth writing requires students to "analyze, interpret, question, and offer individual insights rather than to report given information to a generalized audience" (p. 37).

To question and reflect during the writing process, students must incorporate metacognitive strategies throughout each part of the cycle. Even though every writing cycle may incorporate similar elements, the writing process differs for every writer.
Flower and Hayes (1981) argue that every individual experiences a different writing process depending on what the writer intends to communicate to the reader as well as the writer's own experience with the writing process. Although the writing process is unique for every individual, the triangular communication between the reader, the writer, and the text that occurs during the process of writing makes writing a social and collaborative process rather than an isolated process (Galbraith & Rijlaarsdam, 1999; Graves, 1985). Writing is a reiterative and social process defined by the writer's own experience as well the message the writer wants to convey to the reader (DeSmet et al., 2014; Flower & Hayes, 1981; Galbraith & Rijlaarsdam, 1999; Graves, 1985). The student’s writing process could influence how they use digital writing tools and what type of digital writing tools they use during various stages of the writing process.

**Role and Importance of Writing in the 21st-Century**

Even though the definition of 21st-century literacy has evolved beyond just reading and writing, writing is an essential component of the literacy paradigm. Writing is an essential element of 21st-century literacy because (a) writing must be integrated into all content areas, (b) writing can be tied with student identity, which can influence a student's perception of their writing ability, and (c) writing can influence reading comprehension.

**Integration of writing into content areas.** In 1986, Langer and Applebee examined why process-writing approaches typically existed in the vacuum of the English Language Arts classroom and sought to reveal the benefit process-writing could yield for other content areas. Langer and Applebee (1986) observed that writing in content areas other than English Language arts could be broken down into three types: writing as an
introduction for new content, writing to review material learned, and writing to extend knowledge. Even though content area teachers did not focus on the writing process, Langer and Applebee (1986) determined that purposeful writing tasks such as summary and analysis improve students' thinking and reasoning skills. These findings continue to be supported in current research with the addition of the digital component. In content areas such as science and social studies, writing is a tool that allows students to understand the text and make connections between the text and the outside world even on a digital platform environment (Gorlewski, 2016; Graham & Herbert, 2010; Santelises & Dabrowski, 2015; Sweeny, 2010). For example, digital timeline tools like Sutori or first-person narratives used in virtual environments like those in EcoMUVE help students make connections to the text by integrating writing on a digital platform.

However, there are some negative consequences of the writing process. Thompson (2011) argues that instruction in secondary English Language Arts classrooms can overemphasize the independent stages of the writing process and make students lose focus on the message, which can negatively affect the final product. As early as 1986, Langer and Applebee verified that writing was most beneficial to student learning when teachers assessed the message rather than the accuracy of the writing.

For example, teachers can incorporate more low-stakes writing opportunities like journals, quick writes, or GIST statements to emphasize the importance of the message (Elbow, 1997; Langer & Applebee, 1986; Nobles & Paganucci, 2015). In interviews with high school students about writing, Gorlewski (2016) found that students typically linked writing with an assessment, which could have an adverse effect on the product if the focus of the assignment is primarily on the accuracy of the writing rather than the
message. When instructors integrate writing in content areas, it is essential to understand the positive by-products of writing, such as critical thinking and collaboration, as well as the negative impacts of focusing on mechanical accuracy and assessment. Ultimately, the success of the message the writer sends depends on if the intended audience comprehends it.

**Student identity and perception.** In his article, "All Children Can Write," Donald Graves (1985) said, "When writers write, they face themselves on the blank page. That clean white piece of paper is like a mirror" (p. 38). The expression of language in written form is a personal reflection of one's knowledge. Since writing is a part of a student's identity, writing efficacy is often tied to a student's perception of their writing ability (Gorlewski, 2016; Graves, 1985; Ito et al., 2008; Sanders-Reio et al., 2014). Even though a student may know how to write effectively and understand the assignment, McCarthy, Meier, and Rinderer (1985) contend that if the writer “lacks the belief that he or she can achieve the desired outcome” (p. 466) the written product may not reflect the actual ability of the writer.

Additionally, Graves (1985) stressed that students who already struggle with writing would approach that blank page with a negative perception of their writing ability because writing is a reflective process. Foster and Russell (2002) suggested that a student's identity is an integral part of writing for a particular profession and choosing to write in the vernacular of that profession, "links one's identity [and] one's future" to the profession (p. 14). Therefore, if students cannot write in the language needed to sustain their identity in the professional world, they may see themselves as failures because of their lack of writing skills.
Writing instruction and reading comprehension. Reading and writing are skills that share a symbiotic relationship. Biancarosa and Snow (2006) contend that students who write while reading show more evidence of critical thinking about what they have read. In a study of a freshman college writing class that integrated reading as well, Goen and Gillotte-Tropp (2003) found that there was a significant increase in reading comprehension and critical reasoning for students in the integrated class.

However, writing instruction can be more challenging at the secondary level because the writing instruction is usually embedded in reading instruction in the English Language Arts curriculum (Myers et al., 2016). Integrating writing into core content classes such as social studies and science could benefit the reading comprehension of students in all classes. Therefore, it is essential for instructors in all content areas to realize that increasing the time and frequency of writing can positively impact reading comprehension (Graham & Herbert, 2010; Langer & Applebee, 1986). By making time and space in the curriculum for purposeful writing, teachers can also help students improve other 21st-century skills such as reading.

Students Lack the 21st-Century Literacy Skills Needed to Be Successful

Even though 86% of high school students think they are prepared academically for high school, 68% of college students take at least one remedial course (Center for Community College Student Engagement, 2016). Multiple sources indicate that students lack the skills required to be successful in post-secondary institutions and the workplace (Kivunja, 2014; Partnership for 21st Century Skills, 2010; Santelises & Dabrowski, 2015). Because students lack the 21st-century skills to be successful, students require
remediation and instruction in technology to close the learning gap when they enter college or the workplace.

**Remediation.** Overall, colleges and employers find a need to provide high school graduates with some type of remedial instruction. Biancarosa and Snow (2006) found that 70% of readers require some type of remediation when entering college. This need for remediation costs the nation and employers around 1.3 million dollars every year (Jimenez et al., 2016). Because of a lack of fundamental skills, students spend more time in college, and many students drop out, which hurts matriculation rates as well as opportunities for future employment (Biancarosa & Snow, 2006; Jimenez et al., 2016). Employers and post-secondary institutions agree that the lack of rigor in secondary schools fails to prepare students for colleges or workplaces demanding even basic level skills (Achieve 3000, 2010; Partnership for 21st Century Skills, 2010).

Lack of rigor is most apparent in writing. Foster and Russell (2002) contend that once students leave secondary school, they are not prepared to write for industry professionals because graduates lack fundamental skills. In an attempt to explain the reason for graduates' lack of writing skills, Whitney, Ridgeman, and Masquelier (2011) argue that writing in secondary schools is fake because students "write for teachers or outside examiners" in order to fulfill an assignment or assessment purpose rather than for a real audience (p. 525). Students' lack of necessary writing skills stems from writing assignments in high school that lack real-world application. Overall, the necessary remediation provided by colleges and workplaces indicates that high school graduates need to be more competent in fundamental writing skills to be successful in the post-secondary or workplace environment.
Technology. In addition to traditional literacy skills, secondary students also need the necessary technical skills to be successful in the workplace and college setting. However, even though students have more access to technology, student use of digital devices inside the classroom does not always support the technology skills needed for the workplace (Johnson, 2016; Turner, Abrams, Katíc, & Donovan, 2014). Therefore, even though students may use digital devices outside the classroom regularly, students may still need support when using technology in an academic or workplace setting (Johnson, 2016; Sharp, 2014). As technology continues to evolve, the need for graduates to be literate in technology will increase.

Benefits of Using Digital Writing Tools During the Writing Process

Utilizing digital writing tools during the writing process can help students improve their fundamental writing skills and allow students to address technology competency skills at the same time. This section will examine how digital writing tools can provide writers with opportunities for collaboration, enhance audience awareness for the writer, and allow for easier editing and revision.

Collaboration and Feedback

Even in a classroom full of thirty students, the writing process can still be isolating for each student. Often, students may not feel comfortable having face-to-face writing conferences with their peers. In a study about the use of Wikis during the writing process, Woo, Chu, Ho, and Li (2011) observed that digital writing tools allowed students to collaborate more effectively because of the transparency offered by the ease of sharing drafts on a digital platform. Subsequent studies concur that digital writing tools used during the writing process offer writers more opportunities for peer to peer

The ease of collaboration provides learners more opportunities for feedback from both instructor and peers, which can help students during the writing process (Ito et al., 2008; Lamtara, 2016; Macarthur, 1988; Martin & Lambert, 2015; Sweeny, 2010). Nobles and Paganucci (2015) also noted that students used feedback more when offered in a digital format because it was easier to ask questions about the feedback and create a feedback loop that elicited a more positive perception about writing from students. The transparency during the writing process creates an environment conducive for feedback because writers feel less vulnerable while undergoing the writing process (Boas, 2011; Jesson, McNaughton, Rosedale, Zhu, & Cockle, 2018; Yancey, 2009). The increase in collaboration and prompt feedback supported by the use of digital writing tools during the writing process encourages learners to engage in critical conversations about their writing as well as the writing of their peers.

**Audience Awareness**

The transparency offered by digital writing tools can aid a writer's perception of the audience. Using digital writing tools makes it easier for the learner to share and publish written products that motivate the learner to write better and with a stronger sense of audience (Moore et al., 2016; Pearman & Camp, 2014; Turner et al., 2014). DePalma and Alexander (2015) emphasized that students typically consider the audiences for print-
based texts as less relevant or academic; however, students perceived audiences as public and more relevant when composing using multimodal digital writing tools.

Additional studies acknowledge that digital writing tools allow learners to write for authentic audiences and can provide a more meaningful purpose for the learner (Ghahri, 2015; Macarthur, 1988; Nobles & Paganucci, 2015; Pearman & Camp, 2014; Turner et al., 2014). Lamtara (2016), in addition to Pearman and Camp (2014), argued that increased relevancy could also increase a student's motivation to write. Audience awareness establishes a more relevant purpose for students.

**Ease of Editing and Revision**

Rather than being hampered by pen and paper mode of writing, digital writing tools offer students an easier and quicker way to edit and revise texts. The use of digital writing tools during the revision, and editing stages of the writing process made writing more manageable for students because students could make revisions at any time during the writing process as well as manipulate large sections of text (Al-Jabri & Al-Kalbani, 2018; Martin & Lambert, 2015; Nobles & Paganucci, 2015). Instead of focusing on minor mistakes such as spelling or grammatical errors that were quickly identified by word processing programs or add-on extensions such as Grammarly, the use of digital writing tools allowed students to focus on significant problems related to content during the revision process (Al-Jabri & Al-Kalbani, 2018; Lamtara, 2016).

When combined with proper instruction about how to use digital writing tools, Nobles and Paganucci (2015) observed that the use of digital writing tools helped improve sentence structure and vocabulary throughout the writing process. Overall, using
digital writing tools resulted in written products that contained fewer minor errors (Al-Jabri & Al-Kalbani, 2018; Ghahri, 2015; Macarthur, 1988; Zheng et al., 2016).

**Drawbacks of Using Digital Writing Tools During the Writing Process**

Although digital writing tools can positively influence the writing process, there are reported drawbacks to the use of digital writing tools during the writing process. These drawbacks include the influence of social media, focus on short forms of writing rather than more in-depth essays, and off-task behavior.

The use of social media such as Twitter and Snapchat and texting can make it more difficult for learners to distinguish when to write formally for an audience (Kimmons et al., 2017; Moore et al., 2016; Purcell et al., 2013). However, other studies argue that social media and texting enhance a student's perception of the audience (Ghahri, 2015; Macarthur, 1988; Pearman & Camp, 2014; Turner et al., 2014). Therefore, instructors may find a need for deliberate instruction in this area.

Also, Purcell et al. (2013) reported that teachers were concerned about writer fatigue because tools such as Twitter and text messaging stress shorter forms of written expression than more formal academic writing. However, Mueller (2009) and Yancey (2009) contend that the digital world has forced students to engage in a new type of adaptive rhetoric that requires writers to be acutely aware of their purpose.

Finally, allowing students to use technology in the classroom may create an environment that encourages off-task behavior. Students engaged in social media during the instructional time, even when barriers such as firewalls were utilized (Ito et al., 2008). However, each of the challenges mentioned above is a reminder that some students may need intentional instruction addressing expectations associated with the task.
Student and Teacher Perceptions of Digital Writing Tools

Although the perceptions of students and teachers about the use of digital writing tools during the writing process shared some commonalities, teachers expressed more concerns about the challenges that the students did. This section will discuss student and teacher perceptions about the benefits and challenges of using digital writing tools during the writing process.

Positive Benefits for Students

The perceived benefits of digital tool use during the writing process included more creativity, ownership, and motivation. Students expressed that digital writing tools allowed for more creativity and experimentation with form (Batsila, 2016; Kimmons et al., 2017; Olthouse & Miller, 2012). Additionally, Lamtara (2016) reported that "new technology strengthens the implementation of the process writing activity through appropriate contextual tools and appealing illustrative devices" (p.164.)

Another positive benefit for learners was a greater sense of ownership, which yielded writing of higher quality (Macarthur, 1988; McKee-Waddell, 2015; Nobles & Paganucci, 2015). If students possess the necessary technical skills, the use of digital platforms during the writing process could motivate those who exhibit apprehension about the writing process (Camahalan & Ruley, 2014; Macarthur, 1988; Pearman & Camp, 2014; Sweeny, 2010). Throughout the writing process, digital writing tools could allow students to have more positive writing experiences.

Challenges for Students

The use of digital writing tools during the writing process presented technological challenges for students. Rather than helping the writing process, some students stated that
mastering the technology interfered with the writing process because the technology was difficult to use (DePalma & Alexander, 2015; Howell, Butler, & Reinking, 2017; Johnson, 2016; Martin & Lambert, 2015). Even though many students use technology to compose social media posts daily, some students were not able to connect the relevancy between non-academic and academic writing (Moore et al., 2016; Vue et al., 2016). These challenges could impact the integration of digital tool use during the writing process in the classroom.

Positive Benefits for Teachers

Some of the positive benefits of digital tool use described by teachers echoed those benefits reported by students. Many teachers agreed that digital writing tools made it easier for students to collaborate and share writing with a broader audience (Hutchinson & Woodward, 2014; Moore et al., 2016; Pearman & Camp, 2014). In surveys with teachers, Purcell et al. (2013) reported that 96% of teachers surveyed agreed that digital writing tools helped students reach "wider and more varied audiences" (p. 2). Also, some teachers confirmed that the use of digital writing tools during the writing process resulted in students spending more time on the writing process (DeSmet et al., 2014; Purcell et al., 2013). Similarly, teachers in a study by Johnson (2016) commented that the use of digital writing tools allowed them to place more emphasis on writing.

Challenges for Teachers

However, some teachers found that digital writing tools presented limitations for inexperienced technology users and inexperienced writers. Teachers who were not familiar with the use of digital writing tools hindered student use of the tool because of technical issues and limitations teachers placed on the use of the tool (Hutchinson &
Woodward, 2014; Moore et al., 2016). Some teachers expressed concern about the anonymity offered by digital writing tools and the use of social media writing style creeping into academic writing (Pearman & Camp, 2014; Turner et al., 2014). Therefore, teachers confirmed a need to better educate students about plagiarism since digital tools made it easier for students to copy and paste information (Purcell et al., 2013; Sharp, 2010).

Even though digital writing tools allow students convenient access to revise and edit their writing, some teachers did not find any improvement in writing conventions or essay length when students used digital writing tools during the revision and editing process (Kimmons et al., 2017; Vue et al., 2016; Zheng et al., 2016). These challenges could make it more difficult for teachers to incorporate digital writing tools into their writing instruction.

**Summary**

For 21st-century students, being literate is not defined as just knowing how to read and write. Colleges and employers have demanded that students be able to communicate using technology combined with critical thinking and problem-solving skills (Kivunja, 2015; Partnership for 21st Century Skills, 2010; Sweeny, 2010). Writing is a crucial element of the definition of literacy, and the use of digital writing tools can impact the writing process. However, multiple variables affect the potential impact that digital writing tools can have on the students' writing process from students' perceptions of their writing skills to teachers' unfamiliarity with technology. Ultimately, the process of writing requires an individual to "use language to reveal the truth to himself so that he can tell it to others" (Murray, 1972, p. 12). Therefore, students and teachers need to be
cognizant of the benefits and challenges afforded by digital writing tools. As technology continues to evolve, students will need to adapt to the demands of their environment's definition of literacy.
CHAPTER 3

METHOD

The purpose of this action research study was to describe students’ experiences using digital writing tools to support the different stages of the writing process in Honors-level English classes at a large suburban public high school in the southeastern United States. This study addressed the overall research question: What are Honors-level English students’ experiences with using digital writing tools to support different stages of the writing process? Specifically, this study addressed the following three sub-questions:

1. What are Honors-level English students’ attitudes toward the use of digital writing tools during the different stages of the writing process?
2. How and to what extent do students utilize digital writing tools in an Honors-level English class to support different stages of the writing process?
3. What influences students’ utilization of digital writing tools in an Honors-level English class?

Research Design

Because the catalyst for these questions stemmed from issues occurring in the researcher’s classroom, action research was the most appropriate structure to seek insights about this problem, determine how it impacted the classroom, and improve instructional practices based on those insights (Herr & Anderson, 2005; Mertler, 2017; Mills, 2011). While traditional research attempts to draw conclusions and generalize findings on a larger scale, action research seeks to immediately solve specific problems at
the local level (Herr & Anderson, 2005; Mertler, 2017). Issues at the local level are more critical because, in many cases, the action researcher is an involved stakeholder in the outcome of the research process rather than just a research subject (Buss & Zambo, 2014; Herr & Anderson, 2005).

Rather than operating in a more linear fashion like traditional research process, the action research process evolves through a cyclical or spiral process that typically involves a planning stage, an action stage, an evidence collection stage, and a reflection stage (Johnson, 2008; Mertler, 2017; Riel, 2007; Stringer, 2007). This cyclical process allows the practitioner-researcher multiple opportunities to solve insistent problems rather than just test theories (Herr & Anderson, 2005; Johnson, 2008).

The immediacy and practicality of action research make it beneficial for educators because it enables educators to seek solutions to their problems rather than relying on outside solutions (Mcateer, 2013). Furthermore, these solutions can be tested immediately to determine their effectiveness and adjusted through the cyclical process until the ideal solution is achieved (Johnson, 2008). As the practitioner-researcher, the action research process offered a systematic approach to investigate my students’ attitudes about their utilization of digital writing tools during the writing process. The results of the research provided critical insights that informed future teaching practices within my collaborative network (Buss & Zambo, 2014; Mcateer, 2013).

Since qualitative and quantitative data provide different types of information that were beneficial to my research, I utilized the convergent parallel mixed methods design (Creswell, 2014; Devlin, 2018). Using qualitative data gained from interviews, an open-ended survey question, and reflections students completed after writing essays, I explored
students’ attitudes and perceptions about digital writing tools as they related to the writing process. At the same time, the survey also provided descriptive quantitative data about students’ attitudes and perceptions about digital writing tools as they related to the writing process as well as demographic data. Merging the data sets and evaluating the findings as a whole provided a complete understanding of the problem (Creswell, 2014; Creswell & Plano Clark, 2018). This method allowed the researcher the freedom to collect both types of data and, from a pragmatic perspective, decide on what kind of quantitative or qualitative data was essential to the next phase of the study (Mertens, 2010; Morgan, 2014).

**Setting and Participants**

This action research study took place at a large comprehensive public high school in the southeastern United States. The 58 participants for this study were high school students enrolled in my semester-long English 3 Honors class. The class was 90 minutes long and met daily for 90 days. The sample consisted of 58 students, of which 59% were male, and 41% were female. Most of the students identified as Caucasian (72%) and 25.9% of students identified a different ethnicity, including Hispanic (9%), Mixed (9%), African American (5%), and Asian (3%). Of the 58 students, 57% were 16 years old, and 43% were 17 years old, with most of the students (71%) classified as being in their third year of high school (11th grade). Table 3.1 summarizes the profile of the 58 participants.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>34</td>
<td>59</td>
</tr>
</tbody>
</table>
Based on information from an interest inventory and descriptive essay completed by students at the beginning of the semester, the 58 students taking this course displayed a wide range of interests in extracurricular activities such as sports, clubs, arts, or jobs. Two students expressed interest in joining the military after completing a four-year college, and all students planned to attend a two- or four-year college. Six students received special education services, and four students qualified for English to Speakers of Other Languages (ESOL) services, but these students had exited the ESOL program.

English 3 Honors classes typically consist of students from the 10th or 11th grades. In this study, 17 of the students classified as 10th graders, and 41 of the students classified as 11th graders. The prerequisite for this class is English 2 Honors or teacher recommendation after an exemplary performance in English 2 at the college-prep level. This class counts as one of the four English credits a student needs to graduate high school. Because the school has an open enrollment policy for all AP classes, students
could choose to enroll in an AP English class if they are successful in English 3 Honors. However, students also have the option to participate in dual enrollment English classes at the local technical college or continue in English 4 Honors to gain their fourth English credit.

The English 3 Honors state standards dictate that students analyze works of recognized literary merit from genres of poetry, fiction, and nonfiction. Also, state standards require that writing to understand, explain, and evaluate texts, as well as the rhetoric used to create them, be a significant part of the curriculum. Because the school is participating in the district’s one-to-one initiative, all students in the class had access to their Dell Venues as well as the full suite of Google Apps for Education every day. If they had parent permission, students could also take their devices home. Part of the district initiative to integrate digital devices in the classroom required students to utilize technology for blended learning, collaboration, writing, or digital creation throughout the course.

Average Lexile scores based on Measures of Academic Progress reports for students in 10th and 11th grades range from 1080 to 1385 (Metametrics, 2018). The Lexile Framework suggests how well students’ reading ability may help them comprehend texts (Metametrics, 2018). Of the 58 students enrolled in this course, ten students exceeded the average Lexile score, 40 students fell in between the accepted range, and eight students fell below the 1130 Lexile score, with one student only scoring a 979. However, the average Lexile score of texts that students will read in post-secondary encounters, including colleges and the workforce, is 1300 (Stenner, Sanford-Moore, & Williamson, 2012). The range of academic ability and experience provided
additional information to indicate how students engaged with digital writing tools during
the writing process.

Between 2005 and 2016, the average writing score for high school seniors
decreased by 15 points (U.S. Department of Education, 2018). According to district
curriculum guidelines, writing drives student instruction. Students in English 3 Honors
must proficiently process information and exhibit understanding through various forms of
writing via multiple mediums, including the use of technology. SC College and Career
Readiness (2018) expectations recommend a writing focus for high school students that
explores evidence-based argumentative writing. The district curriculum promotes
integrated literacy by layering texts that offer distinct tiers of meaning and complexity as
the foundation for the expected writing outcomes.

The physical layout of the classroom was designed for students to sit in groups.
While groups may change based on the need of the assignment, students were offered a
choice by choosing their home group at the beginning of the semester. This structure
allowed the researcher to design writing groups based on the differentiated needs of the
students. I was also able to conduct writing conferences more effectively because
students were grouped based on individual writing concerns during each assignment
cycle.

At the beginning of the year, students wrote a response to a practice prompt
created by the district. This data provided baseline writing scores and served as a
diagnostic to determine students’ writing skills. Essays were scored using an adapted
essay rubric modeled after the rubric used to score essay writing sections of standardized
tests such as the ACT or SAT. The adapted scoring guide assessed three domains of the
evidenced-based reading and writing response: reading, writing, and analysis. Each domain was scored separately. This baseline data provided information about students’ writing levels and their ability to analyze a text-dependent prompt.

After the baseline assessment, I monitored student progress by assessing student work samples bi-weekly. During each writing assessment, students participated in writing conferences with peers and the instructor. This continuous cycle provided students with multiple opportunities for feedback. I also monitored literary analysis skills, argument analysis, grammar usage, and mechanics weekly. For monitoring purposes, I used one or more of the following tools: formative writing assessments, interactive grammar instruction using digital site NoRedInk, vocabulary activities, reading on digital CommonLit site, and annotation practice. Also, I provided digital mini lessons that showed students how to use different digital writing tools. Students could access these videos from the class website. Students interacted with digital tools for writing, collaboration, and creation.

Innovation

The purpose of this action research study was to describe students’ experiences using digital writing tools to support the different stages of the writing process in my Honors-level English classes at a large suburban public high school in the southeastern United States. In order to have students interact with digital writing tools while involved in the writing process, I provided video mini lessons on the types of tools available, encouraged students to utilize digital writing tools during the writing process, and advised students to reflect on their use of digital writing tools for at least one of their essays before submitting the final version.
Students employed a recursive writing process that included planning/organizing (prewriting stage), writing/rewriting (writing stage), editing/revision, and publishing (SC College and Career-Ready Standards, 2018). After students completed the initial digital writing tools survey at the beginning of the semester, I posted video mini lessons about how to use the digital writing tools mentioned in the survey on the class website. Figure 3.1 provides an example of a mini lesson.

![Step 1: Add SAS Writing Reviser](image)

*Figure 3.1. Screenshot of video about how to use digital writing tool.*

Every two weeks, students completed writing responses. To write better essays, students must write routinely and persevere in writing tasks over short and extended time frames for a range of domain-specific tasks, and a variety of purposes and audiences (SC College and Career-Ready Standards, 2018). Students received weekly peer and instructor feedback throughout the writing process via the comments tool in Google Docs and during face to face writing conferences, as seen below in Figure 3.2.
Differentiated mini-lessons and writing conferences were provided based on instructor and peer feedback each week.

Writing assignments encouraged students to choose and use at least one of the digital writing tools to aid the various stages of the writing process (ISTE, 2016). For example, the research essay required students to use citation tools to format citations correctly. Students could choose the citation tool, but they had to use the tool while writing the essay. Video mini lessons on the class website provided students with resources about different types of citation tools.

Before submitting final drafts of writing assignments, students were asked to complete at least one reflection about their use of digital writing tools during the writing process. Students explained statements such as how digital writing tools helped them during various stages of the writing process and how digital writing tools impacted their ability to complete the assignment. Appendix B contains complete versions of the student reflection items.
Data Collection

A variety of data collection methods were utilized to explore the three research questions that addressed the following overarching research question: What are Honors level English students’ experiences with using digital writing tools to support different stages of the writing process? These data collection sources included a survey, interviews, and artifacts, such as student essay reflections. Table 3.2 outlines the alignment of research questions with data collection sources. A discussion of the specific details of each type of data collection method is included after the table.

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Qualitative</th>
<th>Quantitative</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are Honors-level English students’ attitudes toward the use of digital writing tools during the different stages of the writing process?</td>
<td>• Interviews</td>
<td>Survey</td>
</tr>
<tr>
<td></td>
<td>• Essay Reflections</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Open-ended survey question</td>
<td></td>
</tr>
<tr>
<td>How and to what extent do students utilize digital writing tools in an Honors-level English class to support different stages of the writing process?</td>
<td>• Interviews</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Essay Reflections</td>
<td></td>
</tr>
<tr>
<td>What influences students' utilization of digital writing tools in an Honors-level English class?</td>
<td>• Interviews</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Essay Reflections</td>
<td></td>
</tr>
</tbody>
</table>

Survey

Surveys are an efficient way to collect information about attitudes and opinions as well as demographic information (Creswell, 2014; Efron & Ravid, 2013; Mertler, 2017).
In order to gauge initial student attitudes about the use of digital writing tools during the writing process, students completed an online survey created by the researcher since no existing surveys could be adapted to yield the desired information (Devlin, 2018). To determine the content validity of the survey, the researcher sought input about the survey questions from the following content matter experts: an English professor at a local college and two English teachers at the researcher’s school (Creswell & Poth, 2018; Gehlbach & Artino, 2018; Robinson & Leonard, 2019).

The process of developing the survey also included a prototype given to students in a previous class. Responses from the pilot testing of questions helped the researcher determine if any questions should be altered or removed to gain more nuanced data (Creswell & Poth, 2018; Robinson & Leonard, 2019). Based on feedback from content area specialists and student responses to the prototype survey, the final survey consisted of 38 items. Because this scale was developed for the purpose of this study, there were no previous reports of reliability. Reliability of the scale was found to be acceptable (Cronbach’s $\alpha = .77$).

The survey was divided into subsections. Questions on the first part of the survey addressed the technology and writing skills of the participants. Students classified their writing and technology skills as excellent, very good, good, fair, or poor since construct-specific responses help focus the respondent on the central idea of the question (Gehlbach & Artino, 2018). The second part of the survey focused on the frequency and types of digital writing tools students used during different stages of their writing process. Question responses consisted of a five-item scale ranging from (1) Always to (5) Not at all. The third part of the survey addressed students’ attitudes about using digital writing
tools during different stages of the writing process. This section consisted of fourteen items. Students responded to statements on a 5-point Likert scale from (1) Strongly Disagree to (5) Strongly Agree. The final part of the survey requested demographic information.

Additionally, students completed an open-ended response describing their attitudes about writing and technology. The information gathered from the surveys helped inform potential interview questions and aided in the selection of potential interview candidates (Devers & Frankel, 2000; Etikan, Musa, & Alkassim, 2016; Tongco, 2007). Table 3.3 outlines survey questions and alignment to the research questions. Appendix A provides a copy of the entire survey.

Table 3.3 Research Questions and Survey Questions Alignment Table

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Survey Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ1: What are Honors-level English students’ attitudes toward the use of digital writing tools during the different stages of the writing process?</td>
<td>I like using the comment tool in Google Docs when providing feedback to peers.</td>
</tr>
<tr>
<td></td>
<td>I like using citation tools to help me during the planning, drafting, or rewriting stages of the writing process.</td>
</tr>
<tr>
<td></td>
<td>I like using digital grammar tools help me improve my writing during the editing or revision process.</td>
</tr>
<tr>
<td></td>
<td>I like using the voice typing tool during the planning, drafting, or rewriting stages of the writing process.</td>
</tr>
<tr>
<td></td>
<td>Are you more likely to consider feedback during the revision and editing stages of the writing process if it is in a digital format?</td>
</tr>
<tr>
<td>RQ2: How and to what extent do students utilize digital writing tools in</td>
<td>How often do you use digital writing tools during the writing process?</td>
</tr>
</tbody>
</table>
I use a digital spell-checking tool when I edit and revise a writing assignment.

I use a digital grammar checking tool when I edit and revise a writing assignment.

I use a plagiarism detection tool before I publish a writing assignment.

I use a graphic organizer tool during the planning stage of a writing assignment.

I use a digital thesaurus or dictionary tool when I draft, edit, or revise a writing assignment.

How would you describe your writing skills?

How would you describe your technology skills?

How would you describe your skills with digital writing tools?

Which digital writing tools have you used?

How do you decide what type of digital writing tool to use during the writing process?

At which stage of the writing process are you most likely to use digital writing tools?

Which type of feedback do you use during the revision and editing stages of the writing process?

The amount of writing required in an assignment influences which digital writing tool I will use.

The purpose of a writing assignment influences which digital tool I will use.

The audience for a writing assignment influences which digital tool I will use.
Interviews

Student survey responses provided information that helped the researcher narrow the question field and avoid creating any leading questions since students may already feel apprehensive about being interviewed by their teacher (Mertler, 2017; Whiting, 2008). Based on responses collected from the surveys, the researcher chose eight students who represented different writing and technology skill levels (Guest & Bunce, 2006). Table 3.4 provides demographic and self-rated skill level information for these students.

Table 3.4 Demographic and Skill Level Information for Students Interviewed

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Ethnicity</th>
<th>Gender</th>
<th>Writing Skill Level</th>
<th>Technology Skill Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buddy</td>
<td>Caucasian</td>
<td>M</td>
<td>Fair</td>
<td>Good</td>
</tr>
<tr>
<td>Callie</td>
<td>Hispanic</td>
<td>F</td>
<td>Fair</td>
<td>Good</td>
</tr>
<tr>
<td>Daisy</td>
<td>Hispanic</td>
<td>F</td>
<td>Good</td>
<td>Very Good</td>
</tr>
<tr>
<td>Darla</td>
<td>Caucasian</td>
<td>F</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Donald</td>
<td>Hispanic</td>
<td>M</td>
<td>Poor</td>
<td>Fair</td>
</tr>
<tr>
<td>Louie</td>
<td>Caucasian</td>
<td>M</td>
<td>Very Good</td>
<td>Very Good</td>
</tr>
<tr>
<td>Miley</td>
<td>Caucasian</td>
<td>F</td>
<td>Very Good</td>
<td>Excellent</td>
</tr>
<tr>
<td>Oscar</td>
<td>African American</td>
<td>M</td>
<td>Good</td>
<td>Good</td>
</tr>
</tbody>
</table>

The researcher conducted a one-on-one interview with each student during their regular scheduled writing conferences. The interviews were semi-structured with open-ended questions (Devers & Frankl, 2000; Mack, Woodsong, MacQueen, Guest, & Namey, 2005; Tongco, 2007). The researcher interviewed students about their attitudes
surrounding the use of digital writing tools during the writing process. Students also identified what influenced their decisions to use digital writing tools during the writing process.

The researcher made digital recordings of all interviews, and video files of the interviews were uploaded to Temi, an automated audio to text transcription service. The researcher checked the transcripts for errors and asked the students interviewed to review the transcripts for accuracy and establish the validity of transcription data (Harper & Cole, 2012; Saldaña, 2016). The information collected from the interviews provided insight into individual perceptions and opinions (Mack et al., 2005) and assisted the researcher in providing a better description of how students think about digital writing tools and the writing process. Table 3.5 provides an overview of the interview questions and alignment to the research questions. Appendix C presents the entire interview protocol.

Table 3.5 Research Questions and Interview Questions Alignment Table

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Interview Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ1: What are English students’ attitudes toward the use of digital writing tools during the different stages of the writing process?</td>
<td>How would you describe your writing process?</td>
</tr>
<tr>
<td></td>
<td>Is there a part of the writing process that you find more difficult than others?</td>
</tr>
<tr>
<td></td>
<td>Why?</td>
</tr>
<tr>
<td></td>
<td>How would you describe your use of digital writing tools during the writing process?</td>
</tr>
<tr>
<td></td>
<td>What do you think are the benefits of using digital writing tools during the writing process?</td>
</tr>
</tbody>
</table>
What do you think are the potential challenges of using digital writing tools during the writing process?

RQ2: How and to what extent do students utilize digital writing tools in an English class to support different stages of the writing process?

What digital writing tools do you use most often during the writing process?

For what purpose do you use this tool? (repeat follow-up question for each tool the student mentions)

RQ3: What influences students' utilization of digital writing tools in an English class?

Why are you most likely to use digital writing tools during the writing process?

What influences your decision to use a digital writing tool?

Describe your favorite digital writing tool to use when writing. Why is this tool your favorite?

How do you discover potential digital tools to use for writing?

Artifacts

Students completed guided reflections about their writing and the use of digital writing tools after at least one of their essays. These reflections served as a source of data about student perceptions (Bloomberg & Volpe, 2015; Saldaña, 2016) during various stages of the writing process. By examining the reflections, I gained more insight into what influences a student’s decision to use digital writing tools because the reflections offered a narrative glimpse into the student’s decision-making process about the use of digital writing tools during the writing process (Cohen, Manion, & Morrison, 2011; Efron & Ravid, 2013). Table 3.6 outlines the student reflection questions and alignment to the research. Appendix B provides a complete version of the questions included in student essay reflections.
Table 3.6 Research Questions and Student Reflection Questions Alignment Table

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Reflection Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ1: What are English students’ attitudes toward the use of digital writing tools</td>
<td>How did the use of digital writing tools impact your ability to complete the assignment?</td>
</tr>
<tr>
<td>during the different stages of the writing process?</td>
<td>What challenges did you face while using this tool?</td>
</tr>
<tr>
<td></td>
<td>Can you give me an example of how a digital tool helped you overcome a challenge during the writing process?</td>
</tr>
<tr>
<td></td>
<td>Which digital tool do you believe helps you improve your writing the most? Why?</td>
</tr>
<tr>
<td>RQ2: How and to what extent do students utilize digital writing tools in an English class to support different stages of the writing process?</td>
<td>At what point in the writing process did you use digital writing tools?</td>
</tr>
<tr>
<td></td>
<td>What digital writing tools did you use to complete the writing assignment?</td>
</tr>
<tr>
<td>RQ3: What influences students’ utilization of digital writing tools in an English class?</td>
<td>Why did you choose these tools?</td>
</tr>
<tr>
<td></td>
<td>Why did you choose to use the digital writing tools at that point during the writing process?</td>
</tr>
</tbody>
</table>

Data Analysis

The collection and analysis of both quantitative and qualitative data offer a complete understanding of the research problem (Creswell, 2014). Quantitative data obtained from surveys was analyzed using descriptive statistics. The qualitative data obtained from open-ended questions, student interviews and student essay reflections was analyzed using memos and inductive analysis. Table 3.7 provides an overview of the alignment of research questions, data sources, and methods of analysis. A full description of quantitative and qualitative data analyses is provided in Chapter 4.
Table 3.7 Research Questions, Data Sources, Data Analysis Methods Alignment Table

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Data Sources</th>
<th>Method of Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ1: What are Honors-level English students’ attitudes toward the use of digital writing tools during the different stages of the writing process?</td>
<td>• Surveys</td>
<td>• Descriptive statistics</td>
</tr>
<tr>
<td></td>
<td>• Interviews</td>
<td>• Inductive analysis</td>
</tr>
<tr>
<td>RQ2: How and to what extent do students utilize digital writing tools in an Honors-level English class to support different stages of the writing process?</td>
<td>• Surveys</td>
<td>• Descriptive statistics</td>
</tr>
<tr>
<td></td>
<td>• Interviews</td>
<td>• Inductive analysis</td>
</tr>
<tr>
<td></td>
<td>• Reflections</td>
<td>• Memos</td>
</tr>
<tr>
<td>RQ3: What influences students' utilization of digital writing tools in an Honors-level English class?</td>
<td>• Surveys</td>
<td>• Descriptive statistics</td>
</tr>
<tr>
<td></td>
<td>• Interviews</td>
<td>• Inductive analysis</td>
</tr>
<tr>
<td></td>
<td>• Reflections</td>
<td>• Memos</td>
</tr>
</tbody>
</table>

Rigor and Trustworthiness

This study employed methods of triangulation, member checking, peer debriefings, and an audit trail to ensure the rigor and trustworthiness of the research. Each of these methods is defined and described in the following paragraphs.

Triangulation

Triangulation “attempts to map out, or explain more fully, the richness and complexity of human behavior by studying it from more than one standpoint and, in so doing, by making use of both quantitative and qualitative data” (Cohen, Manion, & Morrison, 2011, p. 129). Through the use of triangulation of data sources, including student interviews, student artifacts, and memos, the researcher verified the evidence collected and established credibility (Bloomberg & Volpe, 2016). Emergent themes
derived from the student interviews supported similar themes in the student artifacts and researcher memos. The reliance on multiple sources of data to corroborate findings ensured the veracity of the findings.

**Member Checking**

Member checking involves allowing participants to examine the findings to ascertain the accuracy of their input (Creswell, 2014; Mertler, 2017). After the interview process, participants had an opportunity to make sure the transcription was accurate, and there was an opportunity for any clarification. This method of quality control aided in establishing the validity of transcription data (Harper & Cole, 2012; Saldaña, 2016).

**PeerDebriefing**

Peer debriefing utilizes colleagues who “push researchers to another level of understanding because they ask researchers to make explicit what they may understand on a more tacit level” (Herr & Anderson, 2005, p. 78). For this research study, I frequently elicited feedback from colleagues and peers to strengthen my argument (Shenton, 2004). Throughout my entire research study, the dissertation chair and committee challenged my assertions. They provided feedback that assisted me in clarifying my argument, thereby ensuring further validity of my findings.

**Audit Trail**

An audit trail allows a person “to trace the course of the research step-by-step via the decisions made and procedures described (Shenton, 2004, p. 72). The audit trail also provides the researcher with a systematic way to track findings, reflections, epiphanies, and questions throughout the research process. In this research study, I created an audit trail of memos using the comment tool in documents. Using the Delve tool during the
coding of qualitative data, I created memos by defining codes, categories, and descriptive information about students. These memos helped me clarify my thought process and make connections among the data sources. I used Google Docs to keep notes from meetings with my writing group and my dissertation chair. Also, I kept a notebook where I could jot memos to myself and document questions that I had during the analysis of data.

**Plan for Sharing and Communicating Findings**

As an educator, sharing the findings of action research is essential. Teachers often reflect in isolation and neglect to share their conclusions from classroom experiences (Mcateer, 2013) The findings from this study will not only inform my future practices, but it will also provide insights for other teachers. Additionally, sharing any challenges encountered during my research study made the research process transparent and could potentially influence other educators to share their own experiences. By sharing findings in department meetings, district-level professional development sessions, and conferences, I will further my professional development and influence other research efforts regarding the use of digital writing tools during the writing process.

After my research, findings will be shared at the school level with the English department during departmental meetings and further assist the vertical alignment process for English classes. The presentation will give an overview of how students chose digital writing tools to use during the writing process, descriptions of the tools the students chose, and students’ attitudes about the use of tools during the writing process. Since I am also a member of the English Language Arts professional development community at the district level, I will share this presentation with other English teachers in the district
during the district’s curriculum alignment and collaboration summer session. Findings from my study will impact future curriculum development concerning writing and the use of digital writing tools during the process.

As a member of the district-level Educational Technology Task Force, this presentation, as well as the information about digital writing tools and the writing process, will be shared during district professional development to inform educators about the types of digital writing tools students are using during the writing process. During professional development sessions, teachers will learn about digital writing tools that students chose to use during the writing process.

These findings will be shared in a session with other English teachers at the state level during the annual state conference for English teachers. In addition to sharing the findings, I will also share my experiences concerning the action research process to encourage more teachers to share the insights gained from their classroom experiences. During all presentations, I will state that names of the participants involved in the study were replaced with pseudonyms in order to protect the anonymity of the study’s participants.
CHAPTER 4

ANALYSIS AND FINDINGS

The purpose of this action research study was to describe students’ experiences using digital writing tools to support the different stages of the writing process in Honors-level English classes at a large suburban public high school in the southeastern United States. Specifically, this convergent parallel mixed methods study examined students’ attitudes toward using digital writing tools during different stages of the writing process, how students utilized these tools to support different stages of their writing process, and the factors that influenced students’ utilization of these tools.

During the first phase of the study, students completed a survey gauging their writing and technology skills and frequency of digital writing tool use. In the survey, students also identified the types of digital writing tools they used as well as tool preferences and attitudes toward using digital writing tools. Questions on the survey also collected demographic information. During the next phase, the researcher used information from the initial survey to identify potential interview candidates with differing levels of writing and technical ability. During the third phase of the study, a purposive sample of participants was interviewed, and information from these interviews helped focus the creation of questions for the student reflection surveys used during the fourth phase of the study. Lastly, during the fourth phase of the study, students completed reflections about their use of digital writing tools after a major writing assignment.

Results from the study are presented in two sections: quantitative findings and qualitative
findings. Quantitative data included results from the initial survey. Qualitative data included open-ended survey responses from the initial survey, interview transcripts, and student reflections.

**Quantitative Findings**

This section will discuss the quantitative data collected during the study, as well as the instrument and findings. I will present and discuss the findings based on the order of the subsections of the survey.

**Survey**

Quantitative data were collected with an online Google Forms survey distributed to 58 high school students through my Google Classroom. Questions on the first part of the survey addressed technology and writing skills of the participants. The second part of the survey addressed frequency and type of digital writing tool use, influences on digital writing tool use, stages of the writing process when students used digital writing tools, and student attitudes toward using digital writing tools. The last part of the survey collected demographic information about each student.

**Students’ writing and technology skills.** In the first part of the initial survey, students \( n = 58 \) rated their overall writing skills, technology skills, and skills with digital writing tools. Approximately 66% of the students \( n = 38 \) rated their writing skills as either very good or good, whereas 29 % of students \( n = 17 \) rated their writing skills as either fair or poor. Only 5% of the students \( n = 3 \) rated themselves with excellent writing skills. In terms of skills with technology, 72% of students \( n = 42 \) rated themselves either good or very good, whereas 14% \( n = 8 \) of the students rated their technology skills as fair. None of the students rated their technology skills as poor.
Further, 14% of the students \((n = 8)\) described themselves as having excellent skills with technology. Lastly, approximately 69% of students \((n = 40)\) described their skills with digital writing tools as very good or good, whereas 17% \((n = 10)\) of the students rated their skills with digital writing tools as fair, and only 14% of the students \((n = 8)\) considered their skills with digital writing tools as excellent. None of the students rated their skills with digital writing tools as poor. Table 4.1 provides details of student \((n = 58)\) responses for each question.

### Table 4.1 Student Perceptions of Writing and Technology Skill Levels

<table>
<thead>
<tr>
<th>Question</th>
<th>Excellent</th>
<th>Very Good</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>How would you describe your writing skills?</td>
<td>3</td>
<td>15</td>
<td>23</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>How would you describe your technology skills with computers?</td>
<td>8</td>
<td>19</td>
<td>23</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>How would you describe your skills with digital writing tools?</td>
<td>8</td>
<td>14</td>
<td>20</td>
<td>17</td>
<td>0</td>
</tr>
</tbody>
</table>

**Frequency and types of digital writing tools used.** The second part of the initial survey focused on the frequency and types of digital writing tools students use during different stages of their writing process. The first question in this section asked students how often they used digital writing tools. A majority (79%) of students \((n = 46)\) reported that they used digital writing tools frequently or sometimes when they write, whereas 12% of students \((n = 7)\) indicated that they rarely or never used digital writing tools during their writing process, and only 9% of students \((n = 5)\) indicated that they always use digital writing tools when they write. Among the digital writing tools, the
spellchecking tool was used the most often, with 62% of students (n = 36) indicating that they always or frequently use this tool when they edit and revise their work. The next tool was the grammar checking tool with 38% of students (n = 22) indicating that they always or frequently use the grammar checking tool during editing and revising, whereas 34% of students (n = 20) indicated that they always or frequently use a thesaurus or dictionary tool during editing and revising. Also, the plagiarism detection tool was not utilized as frequently as other tools, with 67% of students (n = 39) indicating that they use plagiarism detection tools rarely or not at all. Table 4.2 presents the percentages of students (n = 58) for each digital writing tool option of the scale.

Table 4.2 Frequency of Digital Writing Tool Used During Writing Process

<table>
<thead>
<tr>
<th>Tool/Stage of Process</th>
<th>Always</th>
<th>Frequently</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spellchecking/ editing and revising</td>
<td>21 36%</td>
<td>15 26%</td>
<td>11 19%</td>
<td>8 14%</td>
<td>3 5%</td>
</tr>
<tr>
<td>Grammar/ editing and revising</td>
<td>8 14%</td>
<td>14 24%</td>
<td>14 24%</td>
<td>13 22%</td>
<td>9 16%</td>
</tr>
<tr>
<td>Thesaurus or dictionary/ editing and revising</td>
<td>6 10%</td>
<td>14 24%</td>
<td>17 29%</td>
<td>14 24%</td>
<td>7 12%</td>
</tr>
<tr>
<td>Plagiarism/ Publishing</td>
<td>3 5%</td>
<td>4 7%</td>
<td>12 21%</td>
<td>18 31%</td>
<td>21 36%</td>
</tr>
<tr>
<td>Graphic organizer/ Planning</td>
<td>5 9%</td>
<td>7 12%</td>
<td>16 28%</td>
<td>17 29%</td>
<td>13 22%</td>
</tr>
</tbody>
</table>
Influences on type of digital tool use. Students responded to a question asking which aspect of a writing assignment influences the type of digital tool they use. The purpose of the assignment was the largest influence on determining the type of digital writing tool students would use with 61% of students \((n = 35)\) indicating that assignment’s purpose always or frequently influences their choice of digital writing tools. The next influential aspect was the amount of writing with 54% \((n = 31)\) and, finally, the intended audience with 38% of students \((n = 22)\) indicating that their decision to use a digital writing tool was always or frequently influenced by these factors.

Stage of the writing process for digital tool use. The next part of the survey asked participants to identify during which stage of the writing process they are most likely to use digital writing tools. Approximately 55% of students \((n = 32)\) indicated that they were most likely use digital writing tools during the editing stage; 29% of students \((n = 17)\) indicated that they use digital writing tools during the revision stage; 8% of students \((n = 4)\) indicated that they use digital writing tools during the drafting stage, and 5% of participants \((n = 3)\) indicated that they use digital writing tools during the publishing stage. There was only one student who indicated that they used digital writing tools during the prewriting process.

Types of feedback preferred. The type of feedback students preferred to receive during the revision and editing stages of the writing process varied with 36% of students \((n = 21)\) preferring digital feedback, 31% of students \((n = 18)\) preferring handwritten feedback, 26% of students \((n = 15)\) preferring feedback during face-to-face student-teacher conferences, and 7% of students \((n = 4)\) preferring a combination of digital audio and written feedback.
**Student attitudes about using digital writing tools.** Students’ attitudes about using digital writing tools during different stages of the writing process were measured using a 14-item scale. Students responded to statements on a 5-point Likert scale from (1) Strongly Disagree to (5) Strongly Agree. Because this scale was developed for the purpose of this study, there were no previous reports of reliability. The content validity of the items was established through expert reviews. Reliability of the scale was found to be acceptable (Cronbach’s $\alpha = .77$).

Overall, student attitudes about using digital writing tools were positive with students responding that digital writing tools made it easier to revise essays, receive peer feedback ($M = 3.98$, $SD = 0.78$), and complete writing tasks more quickly and effectively ($M = 3.97$, $SD = 0.86$). Students ($n = 58$) ranked the benefit of digital writing tools for the avoidance of plagiarism last ($M = 3.66$, $SD = 1.00$). Table 4.3 presents the mean and standard deviation for items 28, 29, 30, 31, and 32.

<table>
<thead>
<tr>
<th></th>
<th>$M$</th>
<th>$SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>I believe that digital writing tools make it easier for me to revise essays after receiving feedback.</td>
<td>3.98</td>
<td>0.78</td>
</tr>
<tr>
<td>I believe that digital writing tools help me complete writing tasks more quickly and effectively.</td>
<td>3.97</td>
<td>0.86</td>
</tr>
<tr>
<td>I believe that digital writing tools help me be a more effective writer.</td>
<td>3.91</td>
<td>0.73</td>
</tr>
<tr>
<td>I believe that digital writing tools help enhance my writing skills.</td>
<td>3.84</td>
<td>0.77</td>
</tr>
<tr>
<td>I believe that digital writing tools help me avoid plagiarism.</td>
<td>3.66</td>
<td>1.00</td>
</tr>
</tbody>
</table>
Stages of writing and digital writing tools. This section will describe students’ attitudes about using specific tools for prewriting and planning (questions 22 and 25), writing (questions 21, 22, 24, 26), and revision and editing (questions 19, 23, 27) stages of the writing process.

Prewriting and planning stage. During the prewriting stage, students indicated similar preferences about using digital writing tools for research or graphic organizers. Specifically, students preferred using a graphic organizer tool ($M = 3.26, SD = 1.03$) during the prewriting stage when compared to the research tools ($M = 2.90, SD = 1.10$).

Writing stage. Table 4.4 below presents students’ attitudes toward using specific tools during the writing stage. Students ($n = 58$) indicated that they prefer using the word count tool during their writing process ($M = 4.26, SD = 0.81$). Among the digital writing tools, the voice typing tool was the least preferred tool utilized during the writing stage ($M = 2.43, SD = 1.27$).

<table>
<thead>
<tr>
<th>Table 4.4 Student Preferences for Digital Writing Tools During Writing Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>I prefer using the word count tool, such as the one in Google documents during the writing process.</td>
</tr>
<tr>
<td>$M$</td>
</tr>
<tr>
<td>4.26</td>
</tr>
<tr>
<td>I prefer to use citation tools such as EasyBib during the writing process.</td>
</tr>
<tr>
<td>4.12</td>
</tr>
<tr>
<td>I prefer using thesaurus tools provided by Google documents or slides during the writing process.</td>
</tr>
<tr>
<td>3.17</td>
</tr>
<tr>
<td>I like using the voice typing tool during the writing process.</td>
</tr>
<tr>
<td>2.43</td>
</tr>
</tbody>
</table>

Revision and editing stage. During the revision and editing stages, students indicated a preference for using digital writing tools such as Grammarly to improve
writing ($M = 3.88, SD = 0.92$). Next, students ranked the comment tool in Google Docs as a preferred way to provide feedback to peers during the revision process ($M = 3.50, SD = 0.94$). Dictionary tools were the least preferred digital writing tools utilized by students during the revision and editing stage of the writing process ($M = 3.34, SD = 1.00$).

**Qualitative Findings and Interpretations**

Analysis of data collected during the qualitative phase of the study began with an inductive approach involving multiple overlapping steps that occurred concurrently throughout the research project (Corbin & Strauss, 1990; Creswell, 2017; Glaser & Strauss, 1967). The data analysis process evolved from initial coding to more focused coding for specific details, and these details were lumped into categories (Charmaz, 2006; Saldaña, 2016; Saldaña & Omasta, 2017). Through coding and categorization of the details, persistent themes throughout the data were evaluated and linked to the research questions (Creswell, 2017; Mertler, 2017; Saldaña, 2016). Multiple qualitative data sources ensured a richness of data, and the sources included one open-ended response from the initial survey about using digital writing tools during the writing process, eight individual student interview responses, and two open-ended responses from reflections students completed after writing an essay. Table 4.5 outlines the types and quantity of qualitative data obtained during the study.

**Table 4.5 Summary of Qualitative Data Sources**

<table>
<thead>
<tr>
<th>Types of qualitative data sources</th>
<th>Number</th>
<th>Total number of codes applied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survey open response</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Individual interview transcripts</td>
<td>8</td>
<td>82</td>
</tr>
<tr>
<td>Reflection open responses</td>
<td>6</td>
<td>32</td>
</tr>
</tbody>
</table>
Analysis of Qualitative Data

In the first step of the coding process, video files of the interviews were uploaded to Temi, an automated audio to text transcription service. I reviewed each of the transcripts, corrected any transcription errors that occurred during the automation process, noted gestures such as head nodding, and requested that interviewees review the transcripts for accuracy to establish the validity of transcription data (Harper & Cole, 2012; Saldaña, 2016). Once interview participants verified their transcript, I made corrections in Temi, the transcription was exported as a plain text document, and imported into the Delve qualitative analysis tool. In the Delve tool, I created participant profiles by adding demographic information obtained from survey responses for each participant's transcript. Since interview participants were chosen based on their self-identified writing and technology skill levels, these additional descriptors obtained from survey responses served as a type of memo for identifying descriptive elements of the participant profiles (Charmaz, 2006; Saldaña, 2016).

After choosing potential interview candidates, I requested input from the chairperson of my department to ensure that the final interview participants represented different writing and technology skill levels. Writing is a part of a student’s identity, and writing efficacy is often tied to a student’s perception of their writing ability (Gorlewski, 2016; Graves, 1985; Ito et al., 2008; Sanders-Reio et al., 2014). Therefore, interview participants were selected to ensure that different skill levels were represented during the interview process to maximize insight into the research questions (Creswell & Clark, 2011; Devers & Frankl, 2000; Tongco, 2007). The coding process continued with initial coding (Charmaz, 2006), which is an open-ended process that collects "first impression"
words and phrases (Saldaña, 2016, p. 4). Saldaña (2016) notes that initial coding is a "starting point to provide the researcher analytic leads" for exploration of the research questions (p. 115). For example, during initial coding, I marked each time a student mentioned negative interactions with a digital writing tool. These codes later became a part of the categorical process and evolved into the categories, *lacking consistency* and *lacking familiarity with digital writing tools*. These categories reflect challenges of using digital writing tools, which became the theme, *challenges of digital tool use*, as shown in Figure 4.1.

**challenges of digital tool use (31)**

The challenges of digital tool use addressed any negative aspects of digital tools and in some cases, technology in general. Smaller chunks of this overarching category evolved from participants' comments.

- *easier to commit plagiarism* (3)
  - Making it easy to copy/paste and plagiarize

- *lacking familiarity with tool* (13)
  - Category addresses lack of knowledge about technology or the tool.

- *lacking reliability* (2)
  - This category deals with participant comments about the reliability of technology or

  - *highlight things that don’t need fixing* (9)
    - Tool makes errors

- *internet connection* (3)
  - Need for/Loss of internet access

- *losing work* (2)
  - Loss of work if not autosaved

- *peer changes during feedback* (1)
  - Peers can change work

**Figure 4.1.** Example of code becoming a category and category becoming a theme.
A combination of process coding and in vivo coding identified 82 codes during interview coding. Process coding used gerunds to note participant actions that influenced decision-making processes (Charmaz, 2006; Glaser, 1978; Saldaña, 2016). In vivo coding was used to capture participants' language primarily when phrases were used rather than complete sentences (Charmaz, 2006; Saldana, 2016; Strauss, 1987). For example, interview participant three said the use of digital writing tools "enhanced [his] thinking" and "enhanced thinking by bringing more ideas to [him]." Repetition of this phrase led me to mark it as a code, and in a memo, I commented that the positive connotation of the word, enhances, offered insight into the student’s attitude about digital writing tools. This code evolved into a dimension of the category, improving writing, which was later associated with the theme, benefits of digital writing tool use (Saldaña, 2016).

The participants’ responses were examined line-by-line as part of one phase of the coding process (Charmaz, 2006) since the conversational aspect of the interview made isolating complete sentences more difficult. After a discussion with my dissertation chairperson, we determined that, in some cases, multiple phrases needed to be coded in the line in order to capture the participant’s complete thought. Figure 4.2 illustrates an example of the coding process.

Figure 4.2. Example of coding using multiple phrases.

I employed the same process to code the open-ended responses on the digital writing tools survey and the student essay reflections. After downloading the survey and
reflection responses in an Excel spreadsheet, I assigned a font color each time a different
digital tool was mentioned and added notes on the spreadsheet. Figure 4.3 provides an
example of coding open-ended reflection responses in Excel.

| Why did you choose these tools? | Sharon Sellers: conducting research for essay comments tool to improve syntax
|                               | Sharon Sellers: thesaurus word resolution
|                               | Sharon Sellers: spelling correction
|                               | Sharon Sellers: tool installed
|                               | Sharon Sellers: Grammarly finds mistakes but gives tips to correct them as well.
|                               | Sharon Sellers: already on computer uses it for revision
|                               | Sharon Sellers: past ones to help with writing revision editing
|                               | Sharon Sellers: help write better essay
|                               | Sharon Sellers: tells me what to fix
|                               | Sharon Sellers: word count
|                               | Sharon Sellers: help with writing and revision
|                               | Sharon Sellers: SAS writing reviewer
|                               | Sharon Sellers: Grammarly
|                               | Sharon Sellers: Grammar

I used the research tool to help find what each color symbolized, and I used the comments tool to take advice from my instructor to correct any mistakes I may have not noticed.

helps keep my wording smooth for the reader.

I used the thesaurus for examples of other words I could use to avoid repetition. I used the word count tool as an outline for how my essay would be structured, and I used Grammarly to correct any mistakes I made along the way.

I chose Grammarly because it makes revision really easy when looking for words I spelled incorrectly, and I used the word count to make sure that I don't go over the one page limit.

For spelling and commas,

I already had the tool installed and it works automatically.

I used Grammarly to check for errors in my essay. I like that it will register my mistakes and give me tips to correct my sentences. I use the word count tool to check the number of words I used in my essay. The dictionary and thesaurus tool allows me to correct my word choices.

**Figure 4.3.** Coding of open-ended survey and student reflection responses using an Excel spreadsheet and comment tool.

After analyzing each open-ended response in an Excel format, I copied the responses to a Word document and used different colors to highlight each code identified in the responses. An example of this process can be seen below in Figure 4.4.
In the next cycle of coding, I printed the codes, grouped them by hand, and used focused coding to categorize the codes and evaluate links between the categories (Saldana, 2016). This same process was digitally reiterated using the Delve qualitative analysis tool (see Figure 4.5).
Figure 4.5. Grouping codes by hand and digitally using Delve tool.

Focused coding required “decisions about which initial codes [made] the most analytical sense to categorize [my] data” (Charmaz, 2006, p. 58). Using Lucidchart, a graphic organizer tool, I created a visual diagram of categories and potential themes. Appendix D contains the entire diagram. Figure 4.6 shows a section of this diagram.

Figure 4.6. Example of codes, categories, and themes graphic organizer.
Presentation of Findings

The following section describes qualitative data findings collected throughout the study. Interview participants were assigned pseudonyms, and all transcribed data was presented verbatim to ensure authenticity. When referring to information gained from interview participants’ open-ended survey responses and essay reflections, pseudonyms of the interview participants were used. Numbers (e.g., Student 10) were used to identify sources of additional information obtained from open-ended survey responses and essay reflections from students who were not interviewed. The source of information was also identified as an interview, survey response, or essay reflection. Table 4.6 provides an overview of themes, categories, and assertions.

Table 4.6 Themes, Categories, and Assertions

<table>
<thead>
<tr>
<th>Themes</th>
<th>Categories</th>
<th>Assertions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose for using digital writing tools</td>
<td>• Improving sophistication of writing&lt;br&gt;• Conducting and citing research&lt;br&gt;• Using a tool for convenience</td>
<td>The types of digital writing tools used are influenced by the student’s purpose for digital tool use.</td>
</tr>
<tr>
<td>Influences on the writing process</td>
<td>• Stage of the writing process&lt;br&gt;• Assignment requirements</td>
<td>A student uses different tools during each stage of the writing process or to meet the requirements of the assignment.</td>
</tr>
<tr>
<td>Benefits of using digital writing tools</td>
<td>• Improving writing&lt;br&gt;• Being more efficient</td>
<td>Students utilize digital writing tools because the tools help improve their writing while aiding efficiency.</td>
</tr>
</tbody>
</table>
Challenges of using digital writing tools

- Lacking consistency
- Lacking familiarity with the tool

Students do not use digital writing tools because the tool lacks consistency, or they may not know how to use the tool.

Discovery of digital writing tools

- Finding a tool on your own
- Being influenced to use a tool

Students may search for a digital tool to use on their own, but more often, students are influenced to use a digital tool.

In this section, I will present and define each theme and the subsequent categories that comprise the theme as previewed in Table 4.6.

**Purpose for Using Digital Writing Tools**

While students had many different types of digital writing tools available to them, a student’s choice to use a specific digital writing tool was dependent on the student’s purpose for using the digital tool. Figure 4.7 illustrates the specific types of digital writing tools students used. These tools are highlighted throughout the discussion of theme one: purpose for digital tool use.

*Figure 4.7. Categories and specific types of digital writing tools used.*
Lamtara (2016) reported that "new technology strengthens the implementation of the process writing activity through appropriate contextual tools and appealing illustrative devices" (p.164). When responding to the open-ended question on the survey about how he decided what type of digital tool to use, Buddy echoed the response of other students when he said, “It really depends on the situation. Like if I notice that an essay has a word limit, I use the word count tool.” Another student commented that she chose digital writing tools based on “whatever seem[ed] to fit for that problem or situation in my writing” (Student 44, 5/28/19, Essay Reflection). Therefore, in this study, the purpose of digital writing tool use is dependent on the writer’s need. Overall, participants described three reasons for using a digital writing tool: improving the sophistication of writing, conducting and citing research, and using a tool for convenience.

**Improving sophistication of writing.** The use of digital writing tools can aid students in improving vocabulary and sentence structure throughout the writing process (Nobles & Paganucci, 2015). In this study, students defined this type of improvement as making their writing sound better. After writing an essay, one student commented that digital writing tools “made [her] writing sound more professional and helped [her] write a cohesive piece” (Student 52, 3/18/19, Essay Reflection). From the student perspective, the sophistication of writing equated to making an essay sound more professional by improving word choice and correcting sentence-level errors.

**Improving word choice.** One aspect of improving writing centered around using digital writing tools such as a thesaurus or dictionary to replace basic words with more complex words. During the interview, Daisy said that she would use a digital tool like a thesaurus because “sometimes [she] want[ed] to bump it up to a more like sophisticated
word.” Likewise, Callie commented during her interview that she used a thesaurus “for
words that [she] kn[ew] [were] kind of basic” because she wanted to “up the ante a little
bit.” Also, digital writing tools like a dictionary and thesaurus helped students avoid the
use of repetitive words. Another student said he “used the thesaurus tool to find
synonyms and alternative phrases to correct [any] repetition” (Student 9, 5/24/19, Essay
Reflection). Effective word choice was an issue addressed during the revision or editing
phases of the writing process.

In his interview, Buddy explained that part of his writing process involved
“wait[ing] until the very end to go through and revise” an essay. He also described how
he used the find and replace tool to avoid the repetitive use of a word. When he “felt like
[he] was using too much of [one] word,” he could “search [the word] and try to like come
up with the synonyms for it and stuff.” Choosing a tool such as a dictionary or a
thesaurus was a way students used digital writing tools to improve word choice in their
writing.

**Correcting sentence-level errors.** Another component of sophisticated writing
entailed the correction of sentence-level errors. Students identified sentence-level errors
as those involving sentence length and grammatical issues, including spelling, verb tense,
and punctuation. Overall, student concerns with punctuation focused primarily on
commas and semicolons. Sentence-level errors could make writing difficult to understand
for the intended audience. Students corrected these errors with different digital writing
tools.

One tool available to students was the SAS Writing Reviser. This tool analyzed
student essays and offered statistics dealing with issues such as sentence length, types of
sentences, word choice, and verb tense. Callie noted during her interview that the tool could “definitely help you just keep your sentences like short and like sweet and to the point.” Figure 4.8 depicts an example of sentence length analysis of Callie’s essay.

![Sentence Length Bar Chart](image)

*Figure 4.8. Screenshot of SAS sentence length analysis of Callie’s essay.*

A student also stated that the SAS Writing Reviser tool helped her “with wordiness and extra words” (Student 51, 5/30/19, Essay Reflection). Another student commented that he “used SAS writing reviser to review [his] wordiness and sentence structure” (Student 16, 5/24/19, Essay Reflection). When using the SAS Writing Reviser tool, students ran statistics on their essays to reveal potential problem areas. One student liked that the statistics feature of the SAS Writing Reviser “allowed a quick overlook of [his] entire essay because the [Reviser] highlighted anything out of the ordinary and allowed [him] to quickly and efficiently change it” (Student 50, 5/28/19, Essay Reflection). As depicted in
Figure 4.9, essay statistics provided this student with information about various sentence-level errors.

![Writing Reviser has detected the following information.]

<table>
<thead>
<tr>
<th>Simple sentences</th>
<th>10</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possible sentence fragments</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Possible run-on sentences</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Subject-verb sentence openings</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Prepositional phrase sentence openings</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Dependent clause sentence openings</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Word Recurrence</td>
<td>41</td>
<td>41</td>
</tr>
<tr>
<td>Repeated subject</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Weak verbs</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Present tense verbs</td>
<td>47</td>
<td>47</td>
</tr>
<tr>
<td>Past tense verbs</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Cliches and jargon</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Possible vague words</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Possible vague references</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

*Figure 4.9 Screenshot of SAS Writing Reviser Statistics from Student 50 essay.*

Another component of sentence-level errors included grammar related issues. In both student interview responses and open-ended survey responses, students mentioned the following topics: spelling, verb tense, and punctuation, specifically commas and semicolons. One student said that “tools like spellcheck help [her] correct spelling errors which allows the reader to understand what [she] is trying to say as well as give [her] writing a more professional look” (Student 19, 5/24/19, Essay Reflection). Another student noted that he used digital writing tools because “correct grammar and spelling will make the entire essay sound more fluid and cohesive rather than chunky and awkward” (Student 4, 3/19/19, Essay Reflection). During her interview, Daisy explained that she also found Grammarly useful because she "always goes crazy with commas," and the tool helped her "calm down with the commas." Another student said she used the digital writing assistant, Grammarly, “to help with punctuation and also tenses” (Student 40, 5/30/2019, Essay Reflection). Miley revealed in her interview that she had “been
using Grammarly for two years mostly as a spell check but also to catch [her] silly grammar mistakes” and said the final stage of her writing process involved “scan[ing] [her] paper with Grammarly for punctuation errors.” Sentence-level errors were easier to find and fix with digital writing tools.

Also, students used digital writing tools to make sure their writing made sense to the intended audience. Using digital writing tools makes it easier for the learner to share and publish written products, which motivates the learner to write better and with a stronger sense of audience (Moore et al., 2016; Pearman & Camp, 2014; Turner et al., 2014). Students noted that digital writing tools helped catch errors and make their writing easier to understand. One student explained that she used Grammarly because “writing, it has to make sense, and Grammarly helps with proper grammar” (Student 30, 3/18/2019, Essay Reflection). Another student explained that Grammarly “helped [him] understand where to make sense of [his] sentences and to use the right punctuation in the right place” (Student 40, 5/30/19, Essay Reflection). Digital writing tools offered a perspective that the writer may have missed.

In interviews, two students described the need for digital writing tools during the writing process:

Darla: I read it, I reread it, make sure like I wasn't just in my head saying sentences that don't even make sense, and then I edit it after using digital tools.

Daisy: I know on the actual Grammarly website, if you copy and paste your sentence into the website, it will tell you how to fix your run-on sentences and when to put a comma or if you should just change it to a semicolon or something. So I mean it gives specific details of how to fix sentences, which helps me learn how to like prevent it in the future.
These student experiences reflect findings advocating that digital writing tools enhance a student's perception of the audience (Ghahri, 2015; Macarthur, 1988; Nobles & Paganucci, 2015; Pearman & Camp, 2014; Turner et al., 2014). Students were aware of mistakes, and with the feedback provided by digital writing tools, students could determine if their writing was ready to be published and viewed by the intended audience.

**Conducting and citing research.** Writing is a tool that allows students to understand the text and make connections between the text and the outside world, even on a digital platform (Gorlewski, 2016; Graham & Herbert, 2010; Santelises & Dabrowski, 2015; Sweeny, 2010). When writing research, students used digital for two primary purposes: gathering information as part of the research process and creating citations.

**Gathering information.** Since reading and writing are skills that share a symbiotic relationship, students who write while reading show more evidence or critical thinking about what they have read (Biancarosa & Snow, 2006). In his interview, Oscar explained that digital tools “can give you [access] to more sources” during the research process. Another student said that he “used the research tool in Google Docs to help find what each color symbolize[d]” (Student 1, 5/29/19, Essay Reflection). These students used research tools to clarify their understanding of information further or seek out information to begin the research process.

**Creating citations.** Students also took advantage of digital tools to help correctly cite information in their essays. One student shared that he “researched how to complete MLA format” using tools found in Google Docs (Student 31, 3/18/19, Essay Reflection).
Also, students used citation tools to accurately format source information, as indicated in the interview responses below.

Donald: I use the citation website where you just put everything in, and it cites it for you. I am bad at citations. With the tool, you just have to put in information it tells you to get, and it makes it for you.

Daisy: I had to use [EasyBib] when I was in US history. We had to write essays and um, I used it to help me for citations.

Miley: I think I found out about [EasyBib] last year because Mr. ----- showed me because we had to write a bunch of papers and we had to have like evidence and learn how to cite research.

As evidenced in two of the above quotes, students utilized digital writing tools to help them write essays in other content area classes when research is part of the assignment. 21st-century literacy requires students to use technology as a tool not only for reading and writing but also as a tool for creating information through research (Trilling & Fadel, 2009).

**Using a tool for convenience.** When choosing which digital writing tool to use, the convenience a tool provided during the writing process influenced student decisions. Students considered a tool convenient if it made providing feedback or writing more efficient or easier.

**Providing feedback.** Students found the comment tool in Google Docs useful for feedback from both peers and instructors. One student said the comment tool in Google Docs “help[ed] organize [her] thoughts and also receive feedback on any needed revisions” (Student 40, 3/16/19, Essay Reflection). During her interview, Callie explained how she found the comment tool useful for feedback from instructors and peers:

Callie: The comment tool is very helpful for when [the teacher] goes through it because I can know exactly where I need to fix or what needs to be more put together or what needs just to be redone in
general. I find that really helpful when we do have times that we can make corrections or something. And then say if you want to share the doc with somebody else, they can also do that without actually having to be there.

Even though Miley said that she prefers to write her drafts by hand, she explained why the digital process was much faster and easier to share for the purpose of feedback:

Miley: I like to handwrite stuff, but it's also nice to be able to use technology and it helps the process and makes it faster and more convenient cause I can open up all my different devices so it helps me share it and then I can share it to my mom, and she can edit.

While comment tools typically provide a method for the instructor or peer to provide feedback on writing, Buddy and Miley explained how they used the comment tool in Google Docs as a personal memo tool:

Buddy: Writing the first go-round like I'll put a comment on [the essay] like on that special marking and so then when I go back I can click my comments and it shows them all and then I can see where I've edited and where I need to fix something.

Miley: I use the comment tool as a form of brainstorming during the prewriting process to leave myself notes about the essay.

The ease of collaboration provided learners more opportunities for feedback from the instructor, peers, and a place for self-editing reminders which helped students during the writing process (Ito et al., 2008; Lamtara, 2016; Macarthur, 1988; Martin & Lambert, 2015; Nobles & Paganucci, 2015; Sweeny, 2010).

**Making writing more efficient or easier.** Students defined efficient as anything that makes the writing process faster or more straightforward. One student acknowledged that the “tools help [make] the overall writing process faster, especially during the editing and revision process” (Student 55, 3/19/19, Essay Reflection). Another student admitted she used Grammarly because it was “already installed on [her] computer and it work[ed]
automatically” (Student 6, 5/29/19, Essay Reflection). For one student, the convenience of the tool rested in the fact that “it was already on the computer” and “it finds the mistakes itself” (Student 10, 5/21/19, Essay Reflection). Overall, students indicated they were more likely to use digital writing tools that were more intuitive.

Tools such as the word count tool made it quick and easy for students if an essay had a word count requirement. One student explained that the "word count tool was especially useful at the end of the writing process because it shows how far you [have] gone and how much more you need to do” (Student 4, 5/24/19, Essay Reflection).

Another student commented that she used the SAS Writing Reviser because it is “fast and gets every mistake” (Student 45, 5/24/2019, Essay Reflection). Speed and efficiency were noted multiple times as reasons students used digital writing tools as illustrated by the following quotes from student essay reflections:

Student 58: [Grammarly] allowed for an easier and faster alternative instead of going through and manually adding adjustments. I chose to use Grammarly because it’s very accurate and much faster than Google’s word tool. (5/28/19)

Student 2: Before I started using [Grammarly}, I wasn't doing the right punctuation or spelling correctly. Grammarly helps a lot and helps me write quicker and more efficiently. (3/19/19)

Student 31: Digital writing tools made the essay easier to complete and allowed me to fix my mistakes quickly and efficiently. (5/29/19)

These comments support previous findings that digital writing tools could provide students more time to focus on significant problems related to content during the revision process rather than minor mistakes such as spelling or grammatical errors that were quickly identified by add-on extensions (Al-Jabri & Al-Kalbani, 2018; Lamtara, 2016; Nobles & Paganucci, 2015).
Digital writing tools also helped make the physical process of writing easier.

Students discussed experiences with translation tools and voice typing tools. During his interview, Louie described how he used the translate tool and the Spanish dictionary to help him complete an essay for Spanish class:

Louie: We had had to write an essay in Spanish, and I didn't really know Spanish. So, I used a mixture of Google translate and the Spanish dictionary on...they have a website. It's pretty swell. They say it doesn't work, but it works. It translates directly. And then I would go back to my notes, and I had to figure it out. Like, because you know when you translate directly, it doesn't put it in the correct tense of the end. It's all sorts of complicated to me. So I had to go back on my notes and try to figure out what was wrong and what was right.

Using a combination of two tools to complete his essay, Louie illustrated how digital writing tools provided an opportunity for more resources to make writing an essay more efficient. Buddy explained in his interview that the voice typing tool made it easier for him to write because he “sometimes suffers from like really bad headaches.” The voice typing tool allowed him to keep working even with a headache. Callie also found the voice typing tool useful and explained how she used it as part of her writing process:

Callie: Yes, [the voice typing] tool really helps me because I can see what I'm thinking and not have to just like word it into a way that makes sense. I can just say it and then like split up the pieces from there to make it into one and not just have to think about it so much. So, I just recently figured it. And it just, it makes it easier because for one, you don't have to type it but two, like it just, it brings out all of your ideas onto the paper. So I think that's really helpful.

By adapting digital writing tools to fit their own needs, students were more aware of their purpose and needs when incorporating digital writing tools throughout the writing process. (Mueller, 2009; Yancey, 2009).
Summary of Theme One

Theme one conveyed the students’ purpose for using digital writing tools. The three categories in this theme revealed that students chose digital writing tools for the following reasons: 1) improving the sophistication of their writing, 2) conducting and citing research, and 3) utilizing the convenience offered by the tool. Students made their writing sound more sophisticated by using tools such as the thesaurus tool, Grammarly, and SAS Writing Reviser to improve their diction, correct sentence-level grammar, and spelling errors, and assure that their sentences made sense to their audience. When conducting research, students used citation tools such as EasyBib to help them format citations correctly and prevent plagiarism. Students suggested a preference for using digital writing tools that were convenient and easier to use. This theme addressed student attitudes about using digital writing tools as well as how and why students chose digital writing tools.

Influences on the Writing Process

Theme two focused on factors that influenced students’ choice of digital writing tools during the writing process. Writing is not a linear but rather a reiterative process where different stages of writing can happen at any time during the writing experience (Flower & Hayes, 1981; DeSmet et al., 2014). Therefore, prewriting or revision could occur at any point or reoccur as the writer works through the process of writing. Miley explains this chaotic and reiterative process during her interview:

Miley: Sometimes, I draw out like a graphic organizer, and I write down important concepts that I want to write about, so I know I can plan and just start writing. Sometimes I just feel like just typing [it] out, and I'll sometimes start with the second paragraph because that sometimes helps me, and then I'll go back to the introduction because sometimes I'm not really good at starting off introductions.
So once I can get into the main information, I can organize it in a way. This is all over the place sometimes.

The nebulous and unique nature of the writing process made it more difficult for students to describe how digital writing tools influenced each stage of the writing process. Instead, students discussed two main factors that contributed to their choice of digital writing tools during the writing process: assignment requirements and the stage of the writing process.

**Assignment requirements.** Writing in secondary schools focuses mainly on students writing in order to fulfill an assignment or assessment purpose rather than for a real audience (Whitney et al., 2011), students used the assignment requirements as a filter for choosing which digital tool to utilize. In her interview, Darla said that “the prompt and the expectations of it” helped her determine which digital writing tools she would use for an essay. Callie explained how the length requirements of an essay influenced her selection of word count tool:

Callie: I use it to meet the requirements of the essay, but definitely to see if I need to expand on like what I’m talking about. So like if it’s too short and if there’s no actual word count requirement, but if it’s only like 300 words, I might feel like I need to do more. So, [the word count tool] also helps with figuring out how many words you use and if it’s just more blab and stuff.

The word count tool not only helped with essay length in relation to the assignment requirements, but it also worked for Callie as a way to monitor her writing.

In addition to the required length of an assignment, students also used digital writing tools to help improve an essay grade. The tools can provide an opportunity to potentially improve writing performance (Applebee & Langer, 2013; Gorlewski, 2016; Graham & Herbert, 2010; Nobles & Paganucci, 2015; Santelises & Dabrowski, 2015;
Sweeny, 2010). Donald noted that “without Grammarly, since [he’s] a very bad writer, [he] would have probably failed” (5/29/19, Essay Reflection). Daisy explained that she “used the digital writing tools because they made [her] feel more confident with [her] essay” and using “Grammarly made [her] feel like [she] would get a better grade” (5/22/19, Essay Reflection). Other students also expressed that using digital writing tools could improve their overall score on a writing assignment, as explained in the following quotes:

**Student 52:** The comments tool in Google Docs provided a place for feedback from peers and the teacher. It pointed out what needed to be changed so I could improve my grade. (3/18/19, Essay Reflection)

**Student 36:** I wanted to use Grammarly to make sure my one-pager was correct, and the best it could be to get a good grade. I used the dictionary tool to understand and make sure my words were spelled correctly. (5/24/19, Essay Reflection)

These students used digital writing tools to improve scores on their essays. Even though they shared common goals, they utilized the digital writing tools, comment tool, Grammarly, and dictionary tool, for individual issues specific for their essays.

For students who possess basic technology skills, the use of digital platforms during the writing process could motivate those who exhibit apprehension about the evaluative aspects of the writing process (Camahalan & Ruley, 2014; Macarthur, 1988; Pearman & Camp, 2014; Sweeny, 2010). During his interview, Buddy recalled when his elementary school first received personalized devices that had spellchecking capabilities “if you spell [ed] the [words] wrong [teachers] would take points off.” Now, he uses Grammarly and “noticed that the grade on English papers went from just okay to where [he] wanted them to be, so [Grammarly] gave [him] 10 or 15 points back on papers.” In
interviews with high school students about writing, Gorlewski (2016) found that students typically linked writing with an assessment.

**Stage of the writing process.** Since “writers learn to move back and forth through different stages of writing, adapting those stages to the situation” (Council of Writing Program Administrators, National Council of Teachers of English, & National Writing Project, 2011, p. 8), utilization of tools was dependent on the stage of the writing process the student was experiencing.

Students found the use of digital writing tools helpful during the drafting stage. One student used tools “during the drafting stage because [he] wanted to create a strong foundation for [his] essay” (Student 58, 5/28/19, Essay Reflection). Another student employed tools during the drafting process to “see if [he] [was] following the required word count and [for] general grammar and spelling checks” (Student 4, 3/19/19, Essay Reflection). However, a more confident student “used the tools at the beginning of the writing process because [she] only needed assistance while writing the initial draft of [her] paper” (Student 42, 5/30/19, Essay Reflection).

However, the editing and revision stages of the writing process were where most students expressed a need for using a digital writing tool. Students explained their reasons for using digital writing tools during the editing and revision stages in the following quotes:

**Student 31:** I usually don’t use tools during the actual writing because editing and revision seem to be the more appropriate time to use the tools to edit any mistakes I made. (3/18/19, Essay Reflection)

**Student 2:** I used the tools during the revision process because I wanted to write the essay in my own words first, then after I received feedback, it would be easier to write and revise. (3/19/19, Essay Reflection)
Student 35:  I mainly use my tools in the editing stage to correct my sentence structures. (5/21/19, Essay Reflection)

Student 44:  You are trying to make your writing better in these stages, and you get more ideas about how to change your writing to make it better. That's why I need them while I’m editing and in the revision stage. (5/22/19, Essay Reflection)

These students found digital writing tools to be most helpful during the revision or editing stages of the writing process and the most logical time to use the tools as a mechanical proofreader for their essays.

Still, some students still preferred having digital writing tools available to them throughout the entire writing process. Miley expressed that she “chose to use digital tools at each stage of the writing process to make sure that [she] would write an efficient paper with fewer grammatical mistakes” (3/18/19, Essay Reflection). Other students explained how digital writing tools helped them throughout the entire writing process:

Student 40: Using the tools throughout the writing process allows me to get what I need done correctly without having to take extra time to figure out what needs to be done. (3/25/19, Essay Reflection)

Student 24: I am bad with grammar, so I had [the tools] on the whole time, and if I messed up, they would catch it. (3/28/19, Essay Reflection)

Student 51: I used them throughout the entire process, so when I read it over, it wasn't completely wrong. (5/30/19, Essay Reflection)

In any scenario, students found tools that worked best for their situation and adapted the tool to fit their individual needs.

**Summary of Theme Two**

Theme two described the influences that contributed to a student’s choice of tools during the different stages of the writing process. The two categories of this theme indicated that assignment requirements and the stage of the writing process were primary
motives for which digital tool students chose to use. Assignment requirements such as whether or not the essay had a prompt, a length requirement, or a required an evaluative score influenced which tools a student used. Tools such as the word count tool, Grammarly, and the comment tool in Google Docs helped students during various stages of the writing process. Based on the stage of the writing process that they were in, students chose the tool that worked best for their needs. This theme addressed the study's questions about how students use digital writing tools during the writing process and why students chose specific digital writing tools.

**Benefits of Using Digital Writing Tools**

Theme three centered around the benefits of using digital writing tools during the writing process. Employers and post-secondary institutions contend that once students leave secondary school, they are not prepared to write for industry professionals because graduates lack even basic writing skills (Foster & Russell, 2002). Several studies have indicated that using digital writing tools resulted in written products that contained fewer minor errors (Al-Jabri & Al-Kalbani, 2018; Ghahri, 2015; Kimmons et al., 2017; Macarthur, 1988; Martin & Lambert, 2015; Nobles & Paganucci, 2015; Zheng et al., 2016). In this study, the theme, benefits of using digital writing tools, indicated any mention by students of the positive aspects of using digital writing tools during the writing process. Interviews and essay reflections revealed two key reasons students considered a digital tool beneficial: improving writing and being more efficient.

**Improving writing.** Students indicated that tools were more beneficial when they gave specific types of feedback about errors. Even students who classified themselves as
good writers appreciated tools that helped them correct mistakes before the writing was submitted as Darla explained during her interview:

Darla: I think I'm a good writer, but sometimes it's not for the [state] standards. It doesn't qualify for how I'm supposed to write. So the tools helped me figure out if I'm reading my sentences correctly or if I'm answering the question correctly in terms of grammar or the words I use.

Although Darla felt confident about the content of her writing, she did not feel confident about writing for academic situations when it came to grammar and word choice.

However, students who may be less confident about their writing skills discovered that digital writing tools helped them learn how to improve their mistakes. In their interviews, Daisy and Louie explained how Grammarly’s explanation of their errors helped improve their writing:

Daisy: [Grammarly] tells me if I’m too wordy cause that’s usually my problem. I’m like, wordy with it, and I make really long sentences when I could just easily cut out some words that I don’t need. So yeah, I’ve learned that with Grammarly. We had to correct [our essays], so I probably wouldn’t have been able to finish if I didn’t have help from the online tools.

Louie: I just like how [Grammarly] will tell you. It tells me more than just like you used the wrong, or you misspelled it or used the wrong context or whatever. It’ll tell you as you’re doing it like there’s a little circle on the bottom, and it’ll make a big X.

Another student acknowledged that digital writing tools “made her feel more confident” because the tool “helped her know where and why her commas should really be placed” (Student 3, 3/18/19, Essay Reflection). The digital writing tools gave students a sense of autonomy while providing feedback that could help them prevent future errors.

**Being more efficient.** Digital writing tools offer students an easier and quicker way to edit and revise texts (Al-Jabri & Al-Kalbani, 2018; Martin & Lambert, 2015; Nobles & Paganucci, 2015). Students associated the use of digital writing tools during the
writing process with efficacy and ease. In her interview, Callie explained, "If you write on the computer, it's just easier, just click over to the next tab or something to access resources." Louie shared a similar experience in his interview and observed that more resources were another benefit:

Louie: Like if, if I'm looking up [a word] in a dictionary, you know, that can take, depending on how fast I can look, it can take a minute or two. But on the internet, you just type in the word, and it'll give you more resources like the definition, the part of speech, how to use it in simple sentences. So it's just like really quick.

Digital writing tools made correcting errors and improving word choice quick and simple for students.

Students also noted that digital writing tools make it easier to share information and get feedback on essays. One student explained that the comment tool in Google Docs made it easy to “share [her] essay to get feedback from [her] peers and the teacher” (Student 2, 3/19/2019, Essay Reflection). Callie revealed during her interview that the comment tool in Google Docs “is really helpful when we do peer-editing because if you want to share the [document] with somebody else, you can do that without actually having to be there.” Digital writing tools allowed students to collaborate more effectively because of the transparency offered by the ease of sharing drafts on a digital platform (Woo et al., 2011). Having multiple opportunities for feedback offered students more chances to improve their writing.

**Summary of Theme Three**

Theme three outlined what students considered beneficial about the use of digital writing tools. The two categories of this theme revealed that students found digital writing tools beneficial when the tools helped improve their writing and were efficient to use. Students preferred tools that gave specific feedback about errors because students
wanted to correct as many mistakes as possible before they submitted the essay for grading. When digital writing tools could improve their grade, they found the tools to be beneficial for the writing process. Tools such as Grammarly made it easier for students to submit essays that had fewer errors. Students also preferred digital writing tools that were quick and easy to use. Digital writing tools such as the comment tool in Google Docs made it easy for students to collaborate and share feedback in order to improve their writing. This theme provided information that addressed the study’s questions about students’ attitudes about digital writing tools and factors that influence students’ choice of digital writing tools.

**Challenges of Using Digital Writing Tools**

Theme four, challenges of using digital writing tools, addressed any negative aspects of digital tools and, in some cases, technology in general. Student responses reflected two areas, consistency and familiarity, that impeded or hampered their use of digital writing tools.

**Lacking consistency.** One challenging aspect of using digital writing tools was the lack of consistency. Consistency encompassed poor internet connections, inaccuracy with corrections, and potential for losing work. During his interview when asked what prevented him from using digital writing tools, Louie responded, “Bad internet connections.” If students must struggle with a slow internet connection, they could find digital writing tools less appealing because efficiency was one of the reasons students chose to use digital writing tools.

Other students observed that digital writing tools are not always correct. In her interview, Miley expressed that “sometimes Grammarly doesn't tell [her] all the things that need to be changed. And, it doesn't recognize if [she] use[d] a quotation.” Daisy
echoed this concern in her interview and explained that “sometimes [she’ll] type a sentence in and it sounds right to [her], but it wants [her] to fix something that doesn’t really need to be fixed.” If students doubt the accuracy of the corrections made by the digital writing tool, improving writing would no longer be a reason to use a digital writing tool.

Another challenge was the risk of losing work. In interviews, Miley acknowledged that “if you lose your password, you lose [all] your papers and stuff,” and Oscar stated that "certain technology isn't always reliable." He recalled past issues he had with saving work before "Google save[d] it automatically." Students were hesitant to use a digital writing tool if they had previous bad experiences when using technology.

**Lacking familiarity with the tool.** The second challenging aspect of digital writing tools was the students' lack of familiarity with different tools. Lack of familiarity included not having any knowledge of the tool and not using a tool because the tool was complicated to use. Even though students may use digital devices outside the classroom regularly, students may still need support when using technology in an academic or workplace setting (Johnson, 2016; Sharp, 2014). Students’ use of digital writing tools often interfered with the writing process because the technology was difficult to use (DePalma & Alexander, 2015; Howell et al., 2017; Johnson, 2016; Martin & Lambert, 2015).

Lack of familiarity was a reason that Donald did not use the digital writing tool, Grammarly, until he was a junior in high school. In his interview, when asked why he did not use Grammarly to correct writing errors, Donald responded that he “didn’t know about it until this year.” Another student echoed Donald’s unfamiliarity with digital
writing tools when she expressed that she “[didn’t] use digital writing tools until the revision process because [she] didn't really know how to use them” until we discussed during a writing workshop (Student 3, 3/18/19, Essay Reflection). In her interview, Callie explained that digital writing tools were not a resource she could utilize because “[she] [hadn’t] used very many because [she] [didn’t] know very many.” Students were not confident about using digital writing tools because they were unsure of how to use them.

Another potential problem with students’ lack of familiarity with digital writing tools was losing work if the sharing settings were not correct. During his interview, Louie cautioned that “if [he] [wrote an essay] in Google Docs, it is easy to share it with [peers] for feedback, but [he] had to make sure they [could not] edit it because [he] had some jerk friends.” While many students may see more access to resources as a positive aspect of using digital writing tools, Oscar cautioned during his interview that easier access to resources could “probably [be] the easier route to plagiarism.” This finding indicates that there is a need to better educate students about plagiarism since digital tools make it easier for students to copy and paste information (Purcell et al., 2013; Sharp, 2014). Lack of familiarity included not knowing that a tool existed as well as a lack of knowledge about how to use a tool correctly.

The next challenge that impeded students’ use of digital writing tools was struggling with a tool that was too complicated or difficult to use. Even though Google Docs has an embedded proofreading tool, Miley explained that she preferred to use Grammarly because ”[she] [had not] really experimented with the Google Doc one and since [she] already [knew] how to use [Grammarly] it's just easier and [she] can search it up super-fast and it [had] more resources.” However, Darla found that digital writing
tools like Grammarly had limited capabilities for determining errors, especially "with quotes for the past tense or present tense." Grammarly did not distinguish between literary present tense and past tense, so it flagged the tense of the quote as an error even though it was correct.

If students could not figure out how to use the digital tool correctly, they would move on to other options and find another way to correct the issue. During his interview, Louie described his struggles with using a translation tool:

Louie: If you're not tech-savvy and you don't know how to do things faster; it might be faster for you to just look it up in the book. [The translation tool] was all sorts of complicated to me. So I had to go back on my notes and try to figure out what was wrong and what was right.

Louie's comments reflect a preference for using digital writing tools that are intuitive and make the writing process quicker. When he struggled with using the digital writing tool, he resorted to his written notes to figure out the translation. These responses indicate that even though students use technology to compose social media posts daily, some students sometimes fail to adapt those technical skills to navigate unfamiliar tools and connect the relevancy between non-academic and academic writing (Moore et al., 2016; Vue et al., 2016).

**Summary of Theme Four**

Theme four addressed challenges that students faced when using digital writing tools. Issues with reliability and familiarity of digital writing tools served as potential obstacles preventing the use of digital writing tools. Issues with consistency stemmed from poor internet connections, lack of accuracy with corrections suggested by digital writing tools, potential danger of losing information, and the risk of unintentional plagiarism. This theme provided information that addressed the study’s questions dealing
with students’ attitudes about digital writing tools and factors that influence students’ choice of digital writing tools.

**Discovery of Digital Writing Tools**

Theme five concentrated on how students discovered digital writing tools. In interviews and open-ended response questions, students shared the different ways they were exposed to digital writing tools. Throughout the discussion, students revealed two methods of learning about digital writing tools: finding a tool on their own or being influenced by a peer or teacher to use a tool.

**Finding a tool on their own.** When students discovered a tool on their own, it was typically unintentional. Pop-up ads on websites or YouTube led these students to explore the digital tool advertised. During interviews, students described how they found out about new digital writing tools.

Oscar: Usually, I stumble across them from the features thing. Google, like gives you certain resources like that are, um, uh, what's the word? I guess like sponsors.

Buddy: I got a new computer, and all those ads started playing on my computer. And so I was like, I should try this.

Miley: I think I actually saw a video on YouTube for Grammarly. I was watching, I think it was like a makeup tutorial, and it came up, and I was like, I got to check this out. So I looked it up on Google, and that's how I found it.

Student responses indicated that educational technology companies are aware of the potential digital ads have to get students to try a digital tool. Even though students discovered the tool unintentionally, these students went on to explore and use the digital tool in their writing.

**Being influenced to use a tool.** Teachers and peers influenced students to use digital writing tools. Darla explained that [she] usually [did not] discover [digital writing
tools] on [her] own [because] in classes they're given to [her] as a choice.” Callie stated in her interview that “usually the teachers tell us which [tool] to use.” One student noted that “both tools were chosen by [her] teacher” (Student 52, 3/19/19, Essay Reflection). These students expressed that the teacher controlled which digital writing tools students used.

Another student discovered the benefit of the comment tool in Google Docs when “her teacher used the Google Comments section to tell [her] a sentence sounded repetitive, so [she] used the thesaurus tool to replace the word with something else” (Student 2, Essay Reflection, 5/24/19). In Louie’s case, his teachers and a class introduced him to different types of digital writing tools, as he explained during his interview.

Louie: “Yeah, it's usually it's a teacher that tells me [and] at my old school we had, I don't know if you guys have it here, a Google Applications class, so that's where I usually learned most of my stuff from.”

As these responses indicate, the teacher played a significant role in exposing students to different types of digital writing tools. Students could even implement a resource learned about in one class to help them in another class.

Peers also influenced students to use digital writing tools. In their interviews, two students explained how peers told them about digital writing tools.

Daisy: A classmate first told me about Grammarly. I usually have someone tell me, and then I search for them. I didn't even know Grammarly existed until someone told me. I'll see someone and ask how [they] make sure [their] grammar is on point.

Callie: There's some type of English website where they help you [that] I found from like a couple of people through this class. They told me this website could really help you annotate and like think about your text or what you're trying to try to convey through all your annotations.
Students learned about digital writing tools from more than one source, and these resources provided students access to tools that improved their writing (Applebee & Langer, 2013; Ghahri, 2015; Nobles & Pagannucci, 2015; Pearman & Camp, 2014).

**Chapter Summary**

This convergent parallel mixed methods study examined students’ attitudes toward the use of digital writing tools during different stages of the writing process, how students utilized digital writing tools to support different stages of the writing process and factors that influenced students’ utilization of digital writing tools.

Quantitative data were collected from a teacher-created Google Forms survey containing demographic information and questions asking participants to describe their writing and technology skills, their frequency of digital writing tool use, types of digital writing tools they use, their digital writing tool preferences, and their attitudes about using digital writing tools. Qualitative data were collected from an open-ended survey response where students described their choices about the use of digital writing tools during the writing process, responses from interviews with eight participants, and six open-ended responses from student essay reflections completed after a writing assignment.

Coding of interviews and open-ended responses utilized a combination of process coding and in vivo coding. Through focused coding and categorization of the details, themes throughout the data were evaluated and linked to the three research questions. At the end of the coding process, the data revealed five persistent themes: 1) purpose for using digital writing tools, 2) influences on the writing process, 3) benefits of using
digital writing tools, 4) challenges of using digital writing tools, and 5) discovery of digital writing tools.
CHAPTER 5

DISCUSSION, IMPLICATIONS, AND LIMITATIONS

This chapter positions the findings within the existing literature on students’ experiences with using digital writing tools to support the different stages of the writing process. The purpose of this action research study was to describe students’ experiences using digital writing tools to support the different stages of the writing process in Honors-level English classes at a large suburban public high school in the southeastern United States. This study examined students’ attitudes toward using digital writing tools during different stages of the writing process, how students utilized these tools to support different stages of their writing process, and the factors that influenced students’ utilization of these tools. Five persistent themes evolved from analysis of data 1) purpose for using digital tools 2) influences on the writing process, 3) benefits of using digital writing tools, 4) challenges of using digital writing tools, and 5) discovery of digital writing tools. This chapter will present the discussion, implications, and limitations of the research.

Discussion

It is essential to situate the findings of this research within the broader context of research about students’ use of digital writing tools during the stages of the writing process. Literature defining literacy in the 21st century and the need for strong fundamental writing skills in post-secondary education and the workplace situate discussion of this study in a broader context. The quantitative and qualitative data were
combined and analyzed through the lens of students’ attitudes about using digital writing tools, utilization of digital writing tools during the writing process, and influences on the students’ use of digital writing tools. The three primary research questions that guided this study serve as a basis for the organization of this section.

**Research Question 1: What are Honors-level English students’ attitudes toward the use of digital writing tools during the different stages of the writing process?**

Digital writing tools are defined as web-based resources designed to “engage, motivate, and enhance the classroom writing environment” (McKee-Waddell, 2015, p. 27) while providing opportunities for students to engage in all facets of the writing process (Nobles & Paganucci, 2015). During the study, students had access through the personalized learning devices provided by the district to numerous digital writing tools which had been proven to enhance writing (Jones, 2016; Olthouse & Miller, 2012). In the survey, 88% of students (n=51) confirmed they used digital writing tools frequently, always, or sometimes. Both quantitative and qualitative data denoted student attitudes about using digital writing tools were positive. Students indicated that digital writing tools helped make their writing more effective (M = 3.91, SD = 0.73) and enhance their overall writing skills (M = 3.84, SD = 0.77). In qualitative data, students expressed that digital writing tools made it easier to revise essays, receive feedback, and complete writing tasks more quickly and effectively. Student comments from essay reflections and interviews supported the quantitative findings.

**Revising essays.** Previous studies indicated that technology can provide students access to tools that make the writing process more fluid (Applebee & Langer, 2013; Ghahri, 2015; Nobles & Paganucci, 2015; Pearman & Camp, 2014). Effective word
choice was one of the issues addressed by students during the revision or editing phases of the writing process. Students perceived digital writing tools as a quick and easy way to improve sophistication of their writing by refining word choice and correcting sentence level errors. In essay reflections and during interviews, students communicated that they used dictionary or thesaurus tools to incorporate more complex words in their essays and replace repetitive words. For example, Callie commented that features offered by digital writing tools such as the capability to “edit [words] to make [the essay] look more professional” helped her decide which tool to use (Interview, 9/4/19). These reports echo similar findings that digital writing tools help students use more complex vocabulary and sentence structure when constructing essays (Nobles & Paganucci, 2015).

Students used other digital writing tools such as the SAS Writing Reviser and Grammarly to help find and correct sentence level errors during the revision process. Students noted that digital writing tools helped catch errors which made their writing easier to understand. Student four said, “Correct grammar and spelling [makes] the entire essay sound more fluid and cohesive rather than chunky and awkward.” These statements support previous studies that students found sentence-level errors easier to find and fix when using digital writing tools (Al-Jabri & Al-Kalbani, 2018; Ghahri, 2015; Kimmons et al., 2017; Macarthur, 1988; Martin & Lambert, 2015; Nobles & Paganucci, 2015; Zheng et al., 2016).

Some studies (Kimmons et al., 2017; Moore et al., 2016; Purcell et al., 2013) argued that the use of digital writing tools in social media made it more difficult for learners to distinguish when to write formally for an audience; however, other studies argued that digital writing tools enhanced a student’s perception of the audience (Ghahri,
While other studies posit conflicting findings, student responses in this study indicate a definite awareness of a need to heighten diction and syntax for a more formal academic audience. For example, student eight said in her essay reflection that she “mainly used writing tools in the editing stage to correct [her] sentence structure. Both quantitative and qualitative data suggested students agree that digital writing tools assist them in crafting more sophisticated writing for academic audiences.

**Receive feedback.** Students preferred digital writing tools that gave them a sense of autonomy while providing feedback that could help prevent future errors. For example, Louie noted, as did other students, that he liked using digital writing tools like Grammarly. He said, “It tells me more than just like you used the wrong word, or you misspelled it or used the wrong context or whatever” (Interview, 9/4/19). Digital writing tools also provided students a level of anonymity that more traditional types of feedback do not offer. For less confident writer, it is not as intimidating to revise an essay when feedback is provided by a digital writing tool rather than a peer.

Also, sharing revision suggestions with peers while using the comment tool feature still offered introverted or insecure students less threatening ways to collaborate with other students since writing can be an isolating process (Galbraith & Rijlaarsdam, 1999; Graves, 1985). Survey data confirmed this possibility with 36% of students (n = 21) preferring digital feedback while 26% of students (n = 15) preferred face to face feedback with peers. After revising, students may gain confidence and feel more comfortable soliciting feedback from a peer. Transparency during the writing process creates an environment conducive for feedback because writers feel less vulnerable while
undergoing the writing process (Boas, 2011; Jesson et al., 2018; Yancey, 2009),
especially when initial feedback is provided by a digital tool.

Digital writing tools were another resource for students to gain feedback from
peers or the instructor before submitting essays. A more traditional source of feedback
was using the Google Comment tool to elicit feedback from peers as well as the
instructor. For example, Callie revealed during her interview that features like the
comment tool in Google Docs “are really helpful when [doing] peer-editing because if
you want to share the [document] with somebody else, you can do that without actually
having to be there.” This reflects findings in previous studies that digital writing tools
supported student collaboration more effectively because of the ease offered by sharing
drafts on an asynchronous digital platform (Woo et al., 2011).

Compete writing tasks more quickly and effectively. Students suggested a
preference for using digital writing tools that were convenient and easier to use. Student
55 expressed that “tools help [make] the overall writing process faster especially during
the editing and revision process” (Essay Reflection, 5/21/19). Over half the students
surveyed indicated they used some type of digital writing tool during the writing process
with 62% of students using spellchecking tools, 38% of students using grammar tools,
and 34% of students using tools like a dictionary or thesaurus.

Student 58 also said that digital writing tools like “[Grammarly] allowed for an
easier and faster alternative instead of going through and manually adding adjustments.”
Previous studies also suggest that if students possess basic technology skills, the use of
digital platforms during the writing process could motivate those who exhibit
apprehension about the writing (Camahalan & Ruley, 2014; Macarthur, 1988; Pearman &
Camp, 2014; Sweeney, 2010). Throughout the writing process, digital writing tools have the potential to provide students with a more positive writing experience if the technology is accurate and reliable. However, as Louie indicated, “If you're not tech-savvy and you don't know how to do things fast, it might be faster for you to just look it up in the book” (Interview, 9/4/19). Student interviews and essay reflections supported assertions from other studies (DePalma & Alexander, 2015; Howell et al., 2017; Johnson, 2016; Martin & Lambert, 2015) that digital writing tools often interfered with the writing process because the technology was difficult to use.

**Research Question 2: How and to what extent do students utilize digital writing tools in an Honors-level English class to support different stages of the writing process?**

The writing process is a discovery process that can be grouped into three stages: prewriting, writing, and revision (Murray, 1972). For the purpose of this study, editing was included as part of the revision stage, and publishing was added as an additional stage (SC College and Career-Ready Standards, 2018). However, writing theory suggests that writing is not a linear but rather a reiterative process where different stages of writing can happen at any time during the writing experience (Flower & Hayes, 1981; DeSmet et al., 2014). The writing process is a continual cycle that is affected by individual experiences as well as the social interaction that occurs during the writing process. Therefore, the writing process is different for every student and this was evident during student interviews and essay reflections. This section will discuss how students utilize digital writing tools during the following three stages of the writing process: prewriting, writing, editing/revision, and publishing.
**Prewriting.** In survey responses, interviews and essay reflections, students indicated that they used digital writing tools less during the prewriting stage. Only one student expressed using digital writing tools during the prewriting process. Another section of the survey asked students’ which digital writing tools they preferred for prewriting and planning. Students indicated similar preferences about using digital writing tools for research or graphic organizers. However, students preferred using a graphic organizer tool (\(M = 3.26, SD = 1.03\)). Student 23 explained that he would use “graphic organizer templates in Google Docs or in Google Draw to help organize [his] thoughts before writing [his] essay.” Some students such as Miley expressed that they incorporated more traditional methods during the prewriting stage. Miley said, “Sometimes, I draw out like a graphic organizer, and I write down important concepts that I want to write about, so I know I can plan and just start writing.” However, students did not elaborate about why the prewriting stage offered less opportunities for digital writing tool use. Since the writing process is unique to each individual (Flower and Hayes, 1981), the concept of prewriting may be different to every student.

In interviews and essay reflections, students revealed how they adapted the same tools for use in different stages of the writing process. For example, one student adapted the comment tool to the prewriting and revision stages of the writing process. Student 40 explained that she used the comment tool to “help organize [her] thoughts and also receive feedback on any needed revisions.” The same student also explained how she used the comment tool to place reminders to herself throughout the writing process. This student was adapting the tool to her needs and using the same tool recursively through multiple stages of the writing process (DeSmet et al., 2014; Flower & Hayes, 1981;
Students selected tools based on their needs for the current situation, which supports writing theory about the uniqueness of the writing process.

**Writing.** Students considered the writing stage an ongoing stage that spilled over into editing and revision since some students edited and revised throughout the process. Student 24 explained in his essay reflection that he was “bad with grammar, so [he] had [the tools] on the whole time, and if [he] messed up, they would catch it.” For students, drafting was equivocal to the writing stage. For example in his essay reflection, student 58 said he used tools “during the drafting stage because [he] wanted to create a strong foundation for [his] essay.” Students indicated that they preferred using the word count tool during their writing stage ($M = 4.26$, $SD = 0.81$). Student four explained in an essay reflection that the "word count tool was especially useful at the end of the writing stage because it shows how far you [have] gone and how much more you need to do.” For students, this aspect of the word count tool provided a form of motivation (Batsila, 2016; Kimmons et al., 2017; Lamtara, 2016; Olthouse & Miller, 2012) because they could monitor their writing when assignments had word or page length requirements.

However, Buddy revealed in his interview that he adapted the comment tool for use during the writing stage. He said, “Writing the first go-round like I'll put a comment on [the essay] like on that special marking” that indicates an error. For Buddy, the comment tool served as digital sticky notes for him as he wrote the essay. In a similar fashion, Callie explained in her interview how she adapted the voice typing tool because she struggled with introductions. She used it to “see what [she was] thinking and not have to just like word it into a way that makes sense.” She would speak the words and then
rearrange them to construct a cogent introduction to help her get an essay started. These findings support other studies suggesting that students must incorporate metacognitive strategies throughout each part of the writing cycle (Flower & Hayes, 1981; DeSmet et al., 2014). As evidenced by the many different anecdotes about how students used digital writing tools in atypical way, even though every writing cycle may incorporate similar elements, the writing process differs for every writer.

**Editing and revision.** Donald Graves (2004) said “Until children are able to reread their work critically, revision is anathema.” Still, editing and revision was the stage of the writing process where most students expressed a need for using a digital writing tool with 84% of students indicating they used digital writing tools during this stage. Student 31 explained that he did not “use tools during the actual writing because editing and revision seem[ed] to be the more appropriate time” to use digital writing tools. However, student two preferred to use “the tools during the revision process because [he] wanted to write the essay in [his] own words first.” During the revision and editing stages, students indicated a preference for using digital writing tools such as Grammarly to improve writing ($M = 3.88$, $SD = 0.92$) and Google Docs to provide feedback to peers during the revision process ($M = 3.50$, $SD = 0.94$). These findings support other studies (Moore et al., 2016; Pearman & Camp, 2014; Turner et al., 2014). suggesting that digital writing tools make it easier for the learner to share and publish written products which motivate the learner to write better and with a stronger sense of audience.

**Research Question 3: What influences students’ utilization of digital writing tools in an Honors-level English class?**
In this study, influences on students’ utilization of digital writing tools was considered from the following two perspectives 1) why the student chose the tool and 2) how the student learned about the tool. Students’ reasons for choosing the tool are addressed in the section, purpose for digital writing tool use. How students learn about digital writing tools is addressed in the section, discovery of digital writing tools.

**Purpose for digital writing tool use.** Students chose digital writing tools based their purpose for using the digital writing tool. Stages of the writing process influenced which tool students would use. Since digital writing tools offer students an easier and quicker way to edit and revise texts (Al-Jabri & Al-Kalbani, 2018; Martin & Lambert, 2015; Nobles & Paganucci, 2015), Student 50 used the statistics feature of the SAS Writing Reviser because it provided “a quick overlook of [his] entire essay” and “allowed [him] to quickly and efficiently change [errors].” Lamtara (2016) reported that "new technology strengthens the implementation of the process writing activity through appropriate contextual tools and appealing illustrative devices" (p.164). Contextual tools such as requirements of the assignment also played a role in determining which digital writing tool students selected. Darla said that “the prompt and the expectations of it” helped her determine which digital writing tools she would use for an essay (Interview, 9/4/19). Students used the assignment requirements as a filter for choosing which digital writing tools to utilize.

Students chose digital writing tools for reasons such as improving sophistication of writing and conducting research and citing research. Expectations of 21st-century literacy require students use technology as a tool not only for reading and writing, but also as a tool for creating information through research (Trilling & Fadel, 2009). In his
interview, Oscar explained that digital writing tools “can give you [access] to more sources” during the research process. When conducting research, students preferred using citation tools ($M = 3.34, SD = 1.00$), such as EasyBib to correctly format citations.

Also, students used certain tools simply because the digital writing tool was convenient at the time. In an essay reflection, Student 10 said she used Grammarly because “it was already on the computer” and “it finds the mistakes itself.” Miley preferred to write her drafts by hand, but she explained in her interview that technology “ma[de] [writing] faster and more convenient.” Students indicated that they were more likely to use digital writing tools that were more intuitive because of speed and efficiency.

**Discovery of digital writing tools.** Students discovered digital writing tools on their own through social media ads or peer suggestions. However, in interview responses and essay reflections, students indicated that the teacher plays a significant role in exposing students to different types of digital writing tools. Callie stated that “usually teachers tell [students] which tool to use” (Interview, 9/4/19). In content areas such as science and social studies, writing is a tool that allows students to understand the text and make connections between the text and the outside world even on a digital platform (Gorlewski, 2016; Graham & Herbert, 2010; Santelises & Dabrowski, 2015; Sweeny, 2010). Daisy echoed statements of other students when she revealed she learned about digital writing tools when she “had to use [EasyBib] when [she] was in US History” (Interview, 9/4/19). Therefore, teachers who are not familiar with the use of digital writing tools for the writing process hinder student use of the tools because of technical issues and limitations (Hutchinson & Woodward, 2014; Moore et al., 2016). Since
teachers are a primary way that students discover digital writing tools, it is essential that teachers are knowledgeable about how to utilize digital writing tools effectively.

**Conclusion**

For 21st-century students, being literate is not defined by just knowing how to read and write. Colleges and employers have demanded that students be able to communicate using technology combined with critical thinking and problem-solving skills (Kivunja, 2015; Partnership for 21st Century Skills, 2010; Sweeny, 2010). Consequently, students need to be able to determine which digital writing tool is most applicable to the needs of their situation. By using digital writing tools to enhance their essays, students are indicating an awareness of diction and syntax that makes essays sound more professional.

Because the writing process is a continual cycle that is affected by an individual’s experiences during the writing process, the writing process is unique for every student (DeSmet et al., 2014; Flower & Hayes, 1981; Galbraith & Rijlaarsdam, 1999; Graves, 1985). Since teachers are the main impetus for students being introduced to digital writing tools, it is essential that teachers are knowledgeable about how to utilize digital writing tools effectively because teachers who are not familiar with the use of digital writing tools for the writing process hinder student use of the tools because of technical issues and limitations (Hutchinson & Woodward, 2014; Moore et al., 2016). As a result, students’ purposes for choosing one digital writing tool over another are couched in their own experiences with the tool, their strengths and weaknesses as a writer, and teacher perceptions about digital writing tools.
Implications

This research has implications for me, classroom practitioners, and scholarly researchers. In this section, three types of implications are considered: (a) personal implications, (b) recommendations for incorporating digital writing tools in the writing process, and (c) implications for future research.

Personal Implications

As a result of this study, I have gained personal insights that will help me become a better practitioner. These include (a) changed perceptions, (b) unexpected findings, and (c), interview methodology.

**Changed perceptions.** At the inception of the study, I thought my experiences as a writer were much different from the experiences of my students. Admitting that I still begin essays by scrawling my thoughts on paper because that is how I learned to craft an essay evoked a sense of nostalgia. However, I do transition to the computer at some point during my writing process and use the same digital writing tools that my students referred to in the study. Although I initially thought that my students would have very different and often negative attitudes surrounding writing and the writing process, I realized that we shared more similarities than differences (Gorlewski, 2016; Graves, 1985; Ito et al., 2008; Sanders-Reio et al., 2014). Revisiting the seminal works of writing theorists (Elbow, 1997; Graves, 1985; Langer & Applebee, 1986) reminded me that, as humans, we have a universal need to tell a story from individual perspectives using any tool the writer deems necessary.

**Unexpected findings.** At the onset of the study, I thought students did not utilize digital writing tools because of apathy or cynicism about the writing process. However,
as the study progressed, I discovered that apathy and negativity were not part of the equation at all. As quantitative data indicated, students were positive about digital writing tools. In interviews and essay reflections, students indicated a desire to learn more about digital writing tools to enhance their writing. Since students preferred tools that gave them explanatory feedback rather than those that just corrected errors, they are aware of the potential use of digital writing tools for writing. This observation conflicts with previous studies (Johnson, 2016; Moore et al., 2016; Sharp, 2014), which suggested that even though students use social media tools daily, they fail to associate the use of similar digital writing tools with communication.

Another unexpected finding related to students’ lack of familiarity with digital writing tools. Most of the students in my class have been at the same high school for at least two years. In some cases, students have been in the district since elementary school. Since the district began the one digital device for every child initiative seven years ago, it was surprising that students were not as familiar with how beneficial digital writing tools can be throughout the writing process (Applebee & Langer, 2013; Ghahri, 2015; Nobles & Pagannucci, 2015; Pearman & Camp, 2014). In interviews and essay reflections, several students admitted that they had never heard of digital writing tools other than spellcheck until this study. For example, one student who has been in the district since middle school stated that he did not know about a very common tool, Grammarly, until he was a junior in my class. Since digital writing tools can help students improve vocabulary, sentence structure, and lessen grammatical errors, exposure and instruction about these tools would be beneficial for students.
**Interview methodology.** As a novice researcher, the most challenging part of this study was the interview process. Even though I completed several revisions of the interview protocol and questions, nothing could have prepared me for interviewing teenagers about digital writing tools and their writing process. It was necessary that I embraced a reflexive approach to the interview process (Hand, 2003; Bloomberg & Volpe, 2015) by acknowledging my limitations and bias.

Even though students had been in my class almost two months before interviews began, there was still evidence of the apprehension phase at the beginning of the interview (Whiting, 2008). I interviewed students during their regular writing conference times to help them feel comfortable. However, the normalcy of the time and location did not assuage the anxiety of the students, and it took longer to move to a more relaxed state during the interview. Interview transcripts captured this apprehension through students’ use of filler words such as *like* and *um* (Treece & Treece, 1986; Whiting, 2008). As a novice interviewer, I took for granted that students would feel comfortable, and it would not be necessary to spend time building rapport at the beginning of the interview.

Because of the awkward tension at the beginning of some of the interviews, I began asking probing questions to solicit a response before students had a chance to fully internalize the interview question. Even though I incorporated other interview techniques such as echo, silence, and verbal agreement (Whiting, 2008), students may have misinterpreted those techniques as urgency or disapproval because, as my students, they wanted my affirmation. During member checking when students validated their interview transcripts, some students expressed surprise when they saw the number of filler words they used, and one student even commented that she was nervous during her interview.
Even though I was fastidious about my interview protocol and revised it several times based on comments received during peer debriefing, my inexperience as an interviewer was evident as I reflect on the process. By not taking time to develop a rapport with students as a researcher rather than their teacher before beginning the actual interview, I diminished opportunities to obtain more detailed responses to my questions. Interview skills are developed over time through varied experiences, and I intend to hone these skills during future research opportunities.

**Recommendations for Incorporating Digital Writing Tools in the Writing Process**

In this study, students acknowledged that the teacher was a significant influence on student’s use and selection of digital writing tools. Findings from this study suggest potential recommendations for incorporating instruction about digital writing tools used in the writing process for teacher preparation programs as well as providing more differentiated professional development opportunities about digital writing tools for current teachers.

**Teacher Preparation Programs**

Instructional technology has become an essential element of 21st-century teaching skills (NCTE, 2013; ISTE, 2016; Straub, 2009). According to Straub (2009) in his discussion of technology adoption theory, the teacher is “the initial recipient of change, [and] this change also filters down to the students. The teacher is not only an adopter of the innovation but also must act as a change agent for his or her students” (p. 636). However, if teachers are not familiar with how to use and implement digital writing tools into their classrooms, students may have negative interactions with the tools or no interaction at all if the teacher is resistant. Other studies have suggested that teachers who
were not familiar with the use of digital writing tools for the writing process hindered student use of the tool because of technical issues and limitations teachers placed on the use of the tool (Hutchinson & Woodward, 2014; Moore et al., 2016). It is essential that teacher certification programs require teachers to learn how to implement technology in the classroom. Even after achieving initial content area certification, it is necessary for novice teachers to stay current with educational trends in technology (McGarr & McDonagh, 2019). Teacher education programs should stress the importance of participating in professional learning networks to stay abreast of educational technology trends.

**Current Teachers**

Although many districts implementing one to one programs have invested large sums of money and time in professional development to help teachers stay current with educational technology, there is still a gap in digital competence between teachers and students (Håkansson Lindqvist, 2015; Kiss & Mizusawa, 2018). Understanding how to use a digital writing tool is just one facet of the professional development puzzle. Teachers must have protected time to internalize how the tool works, determine implications for student use, and evaluate the reliability of the tool (Ertmer & Ottenbreit-Leftwich, 2010). If teachers are not comfortable using a digital writing tool, they will not become an agent of change for the students (Straub, 2009). It is very easy for teachers to feel overwhelmed by the ever-changing array of educational technology tools that they are required to use, and this can prevent teachers from being an agent of change.
Implications for Future Research

The findings of this study suggest implications for future research by teachers or researchers interested in the utilization of digital writing tools during the writing process. One recommendation for further research would be to conduct research on the effectiveness of the study’s most preferred digital writing tools. It would be interesting to determine if the options offered in the premium version of Grammarly are more effective at helping students internalize grammar errors in their own writing than large adaptive platforms such as No Red Ink. Grammarly can be added as Chrome extension or used as an add-on in Microsoft Word. While the free version of Grammarly offers basic editing options, the premium version allows students to filter corrections based on audience for the essay and purpose of the essay. The tool also monitors your frequent errors and sends motivational updates regarding your writing success each week. Students found Grammarly much more effective than the grammar and editing tools offered in Google Docs or Microsoft Word. In the interviews and essay reflections, students repeatedly commented that Grammarly aided them in correcting errors and helped them understand why a mistake was wrong.

Since I had an unexpected finding related to students’ lack of familiarity with digital writing tools, another recommendation for future research would be to conduct an action research study to isolate factors that contribute to students’ lack of familiarity with digital writing tools. Although I had originally suspected that apathy could be an issue, student responses and other research studies (Håkansson Lindqvist, 2015; Olofsson et al., 2017) indicated that teacher perceptions about digital writing tools may be just one factor to consider. This information could also provide further guidance for teacher education.
programs, instructional coaches at the school level, content area learning specialists at the
district level, and digital integration specialists within school districts.

Another implication for future research would be to investigate whether students
in other levels of English classes share my students’ attitudes about using digital writing
tools during the writing process. Since the students in the study were Honors-level
students and many were already taking AP courses, it would be beneficial to discover
how students in different classes perceive the use of digital writing tools.

Limitations

As with any research study, there are limitations for this study that should also be
noted. These limitations include the following: (a) self-reporting instruments, (b) sample
size, (c) positionality, and (d) students’ prior knowledge.

Self-Reporting Instruments

One limitation of the study was the use of self-reporting instruments. The sole
source of quantitative data was a survey. This survey required participants to self-report
about their skills in writing and technology, their attitudes about using digital writing
tools, and their frequency of digital writing tool use. Bias in self-reporting instruments
can include response bias and order bias (Creswell & Poth, 2018; Gehlbach & Artino,
2018). Social desirability is a type of response bias that occurs when respondents answer
questions in a way that is more socially acceptable (Robinson & Leonard, 2019). When
assessing their own skill levels, very few students rated their skills as poor because they
perceived it as an undesirable response. Another issue could be order bias, which relates
to the placement of questions and answers in the survey (Booth, Papaioannou, & Sutton,
2012). When responding to frequency and preference questions, students were vulnerable
to choosing answers that came first in the response (Creswell, 2007; Ruel, Wagner, & Gillespie, 2016). However, measures such as grouping questions by topic and leaving demographic questions until the end of the survey helped to mitigate bias.

**Sample Size**

Since study participants were students in my classes, findings of this action research are limited by the context of my classroom (Buss & Zambo, 2014; Mertler, 2017). The small number of students that participated in the study is a limitation because students in my three classes are not representative of the students in other classes or attending other high schools (Bloomberg & Volpe, 2015). Also, the students in my class were all Honors-level students. Of the 58 students enrolled in this course, ten students exceeded the average Lexile score, 40 students fell in between the accepted range, and eight students fell below the 1130 Lexile score, with one student only scoring a 979. Therefore, the group was more academically homogenous with only a few outliers.

Also, the number of interview participants was only eight, and this further limits the study even though the purpose of action research is not to generalize findings outside the context of my classroom (Efron & Ravid, 2013). A larger sample size would have provided more data and potentially more insight about students’ use of digital writing tools during the writing process.

**Positionality**

Since I was the researcher and participants were students in my classroom, my positionality as the insider means that my research has an element of self-reflection (Herr & Anderson, 2005). I attempted to mitigate any bias by maintaining an audit trail and memos, engaging in frequent peer debriefing, and utilizing member checking for accuracy of participant responses (Charmaz, 2006; Creswell, 2007. However, I am also
aware that my position of authority as the teacher had the potential to inadvertently influence student responses, especially during interviews, because students wanted to provide helpful responses to the questions.

**Students’ Prior Knowledge**

During the study, students had access through personalized learning devices provided by the district to numerous digital writing tools. Even though all students in my study had equal access to technology while they were in my classroom, I did not have extensive histories about each student’s prior experiences with technology. Some students indicated in interviews or essay reflections that they didn’t know about digital writing tools. However, other students who were more experienced with technology were not afraid to try the tool after seeing it in a YouTube advertisement. Therefore, some students were more knowledgeable about digital writing tools, while other students did not know what the red line under a misspelled word meant. Several students purchased premium versions of Grammarly and received access to more features than the free version offers. However, this access to additional features made these students resistant to trying other digital writing tools. Finally, some students felt overwhelmed by the different digital writing tool options and experienced technology fatigue.

**Closing Thoughts**

Katherine Yancey (2009), former president of the National Council of English Teachers, asserted that writing was not as historically respected because “through reading, society could control its citizens, whereas through writing, citizens might exercise their own control” (p. 2). As my students read George Orwell’s dystopian novel,
1984, the protagonist’s job of rewriting historical documents at the Ministry of Truth reminded me that language shapes history.

Although I chose to major in English in college because I believe that the written word has enormous power, as an educator, I believe our primary responsibility is to create literate citizens for the future. However, it is not just English teachers who are tasked with this responsibility. All educators bear the burden of this often-Sisyphean task. Students should not graduate high school and pay for remedial English courses at a post-secondary institution or not be able to complete a job interview because their writing skills are substandard. If that happens, education has failed them. All students need to cement a strong foundation in the skills that will make them successful and capable of advocating for their rights as citizens.

Becoming fluent with all the available digital writing tools to enhance their own writing process will allow students a stronger foothold on college and career-ready skills such as critical thinking and communication. Donald Murray (1991) said, “We become what we write. That is one of the great magics of writing” (p. 71). As educators, we must equip students with all the tools that can help them harness the power of the written word, so they can write what they wish to become.
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APPENDIX A

SURVEY QUESTIONS

Survey Instructions
This survey is for informational purposes to determine your perceptions about the use of digital tools during the writing process. The data collected from this survey will not be attributed to your name in any way. Thank you for participating in the survey.

* Required

1. Email address *

Writing and technology skills
Please choose the response that best describes your writing and technology skills.

2. How would you describe your writing skills? *
   Mark only one oval.
   - Excellent
   - Very Good
   - Good
   - Fair
   - Poor

3. How would you describe your technology skills with computers? *
   Mark only one oval.
   - Excellent
   - Very Good
   - Good
   - Fair
   - Poor

4. How would you describe your skills with digital tools like Google Apps? *
   Mark only one oval.
   - Excellent
   - Very Good
   - Good
   - Fair
   - Poor
Frequency of digital tool use
Based on your experience with digital tools, please indicate the frequency of your digital tool use during the writing process.

5. How often do you use digital tools during the writing process? *
   Mark only one oval.
   - [ ] Always
   - [ ] Frequently
   - [ ] Sometimes
   - [ ] Rarely
   - [ ] Not at all

6. I use a digital spellchecking tool when I edit and revise a writing assignment. *
   Mark only one oval.
   - [ ] Always
   - [ ] Frequently
   - [ ] Sometimes
   - [ ] Rarely
   - [ ] Not at all

7. I use a digital grammar checking tool when I edit and revise a writing assignment. *
   Mark only one oval.
   - [ ] Always
   - [ ] Frequently
   - [ ] Sometimes
   - [ ] Rarely
   - [ ] Not at all

8. I use a digital thesaurus or dictionary tool when I draft, edit, or revise a writing assignment. *
   Mark only one oval.
   - [ ] Always
   - [ ] Frequently
   - [ ] Sometimes
   - [ ] Rarely
   - [ ] Not at all
9. I use a plagiarism detection tool before I publish a writing assignment. *
   Mark only one oval.
   - Always
   - Frequently
   - Sometimes
   - Rarely
   - Not at all

10. I use a graphic organizer tool during the planning stage of a writing assignment.
    Mark only one oval.
    - Always
    - Frequently
    - Sometimes
    - Rarely
    - Not at all

Decisions about digital tools
These questions will ask information about the types of digital tools you may use and how you choose which digital tool to use.

11. Which of the following digital tools have you used during the writing process? Check all that apply. *
    Check all that apply.
    - Research tool in Google Docs
    - Translate tool in Google Docs
    - Voice typing tool in Google Docs
    - Grammarly
    - Graphic organizer tools like Google Draw
    - EasyBib citation tool
    - Comments tool in Google Docs
    - Word count tool
    - Dictionary tool
    - Thesaurus tool

12. How do you decide what type of digital tool to use during the writing process? *

   
   

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13. The purpose of a writing assignment influences which digital tool I will use. *
   Mark only one oval.
   □ Always
   □ Frequently
   □ Sometimes
   □ Rarely
   □ Not at all

14. The intended audience for a writing assignment influences which digital tool I will use. *
   Mark only one oval.
   □ Always
   □ Frequently
   □ Sometimes
   □ Rarely
   □ Not at all

15. The amount of writing required in a writing assignment influences my use of digital tools that I will use. *
   Mark only one oval.
   □ Always
   □ Frequently
   □ Sometimes
   □ Rarely
   □ Not at all

16. At which stage of the writing process are you most likely to use digital tools? *
   Mark only one oval.
   □ Prewriting
   □ Drafting
   □ Editing
   □ Revision
   □ Publishing

17. In order to improve the quality of your writing, which type of feedback do you use during the revision and editing stages of the writing process? *
   Mark only one oval.
   □ Digital typed feedback
   □ Digital audio comments
   □ Handwritten comments
   □ Face to face feedback during a writing conference
   □ A combination of digital audio and written comments
18. In order to improve your writing, are you more likely to consider and use feedback during the revision and editing stages of the writing process if it is in digital format? 

Mark only one oval.

☐ Yes
☐ No

Attitudes about using digital tools
Based on your experience with digital tools, please indicate the level of agreement about your preference concerning the use of digital tools during the writing process.

19. I like using digital writing tools such as Grammarly help me improve my writing during the drafting, editing, or revision process. *

Mark only one oval.

☐ Strongly agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly disagree

20. I like using the voice typing tool during the writing process. *

Mark only one oval.

☐ Strongly agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly disagree

21. In order to improve my citation skills, I prefer to use citation tools such as EasyBib during the writing process. *

Mark only one oval.

☐ Strongly agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly disagree
22. If I am writing an essay that requires outside sources, I prefer to use research tools such as those in Google documents or slides to find information during the planning stage of the writing process. *
Mark only one oval.
☐ Strongly agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly disagree

23. I prefer using the dictionary tools provided by Google documents or slides during the revision process. *
Mark only one oval.
☐ Strongly agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly disagree

24. I prefer using thesaurus tools provided by Google documents or slides during the writing process. *
Mark only one oval.
☐ Strongly agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly disagree

25. I prefer using graphic organizers such as those provided by Google documents or slides during the prewriting process. *
Mark only one oval.
☐ Strongly agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly disagree
26. I prefer using the word count tool such as the one in Google documents during the writing process. *
   Mark only one oval.
   ○ Strongly agree
   ○ Agree
   ○ Neutral
   ○ Disagree
   ○ Strongly disagree

27. I prefer using the comment tool in Google Docs to provide feedback to my peers as part of the revision process. *
   Mark only one oval.
   ○ Strongly agree
   ○ Agree
   ○ Neutral
   ○ Disagree
   ○ Strongly disagree

28. I believe that digital tools help enhance my writing skills. *
   Mark only one oval.
   ○ Strongly agree
   ○ Agree
   ○ Neutral
   ○ Disagree
   ○ Strongly disagree

29. I believe that digital tools make it easier for me to revise essays after receiving feedback. *
   Mark only one oval.
   ○ Strongly agree
   ○ Agree
   ○ Neutral
   ○ Disagree
   ○ Strongly disagree

30. I believe that digital tools help me complete writing tasks more quickly and effectively. *
   Mark only one oval.
   ○ Strongly agree
   ○ Agree
   ○ Neutral
   ○ Disagree
   ○ Strongly disagree
31. I believe that digital tools help me be a more effective writer. *
   Mark only one oval.
   - Strongly agree
   - Agree
   - Neutral
   - Disagree
   - Strongly disagree

32. I believe that digital tools help me avoid plagiarism. *
   Mark only one oval.
   - Strongly agree
   - Agree
   - Neutral
   - Disagree
   - Strongly disagree

Demographic information
The data collected from this survey will not be attributed to your name in any way. Thank you for participating in the survey.

33. Last Name *

34. First Name *

35. Gender *
   Mark only one oval.
   - Female
   - Male
   - Prefer not to say

36. Ethnicity *
   Mark only one oval.
   - Caucasian
   - African-American
   - Asian
   - Native American
   - Hispanic
   - Mixed
   - Prefer not to say
37. **Age** *
   *Mark only one oval.*
   - 16
   - 17
   - 18

38. **Grade level** *
   *Mark only one oval.*
   - 10th grade
   - 11th grade
   - 12th grade
APPENDIX B

ESSAY REFLECTION QUESTIONS

Student Reflection: One-Pager The Scarlet Letter
Directions: Please respond to the following questions at the submission phase of each piece of writing. This will be submitted with the final draft of the essay.

* Required

1. Email address *

Decisions about digital tools
These questions will ask information about the types of digital tools you used, how you choose which digital tool to use, and how the tool helped you.

2. Which of the following digital tools did you use during the writing process? Check all that apply. *
   Check all that apply.
   - Research tool in Google Docs
   - Translate tool in Google Docs
   - Voice typing tool in Google Docs
   - Grammarly
   - Graphic organizer tools like Google Draw
   - EasyBib citation tool
   - Comments tool in Google Docs
   - Word count tool
   - Dictionary tool
   - Thesaurus tool
   - SAS Writing Reviser

3. Why did you choose these tools? Please explain your answer for each tool separately. *
4. Describe a challenge you faced while using each tool. How did you overcome that challenge? *

______________________________________________________________
______________________________________________________________
______________________________________________________________
______________________________________________________________

5. At what stage in the writing process did you use digital tools? Check all that apply. *

Check all that apply:
- Prewriting
- Drafting
- Editing
- Revision
- Publishing

6. Explain why you choose to use digital tools at each stage of the writing process checked. *

______________________________________________________________
______________________________________________________________
______________________________________________________________
______________________________________________________________

7. Explain how the use of digital tools impacted your ability to complete this assignment. *

______________________________________________________________
______________________________________________________________
______________________________________________________________
______________________________________________________________

8. Give an example of how a digital tool helped you overcome a challenge during the completion of this writing assignment. Be sure to name the tool. *

______________________________________________________________
______________________________________________________________
______________________________________________________________
______________________________________________________________
9. Which digital tools do you believe help you improve your writing the most? *
   Mark only one oval.
   - Research tool in Google Docs
   - Translate tool in Google Docs
   - Voice typing tool in Google Docs
   - Grammarly
   - Graphic organizer tools like Google Draw
   - EasyBib citation tool
   - Comments tool in Google Docs
   - Word count tool
   - Dictionary tool
   - Thesaurus tool
   - SAS Writing Reviser

10. Explain why you found this tool the most helpful. *
Student Reflection: One-Pager The Great Gatsby

Directions: Please respond to the following questions at the submission phase of each piece of writing. This will be submitted with the final draft of the essay.

* Required

1. Email address *

Decisions about digital tools

These questions will ask information about the types of digital tools you used, how you choose which digital tool to use, and how the tool helped you.

2. Which of the following digital tools did you use during the writing process? Check all that apply. *

Check all that apply.

- [ ] Research tool in Google Docs
- [ ] Translate tool in Google Docs
- [ ] Voice typing tool in Google Docs
- [ ] Grammarly
- [ ] Graphic organizer tools like Google Draw
- [ ] EasyBib citation tool
- [ ] Comments tool in Google Docs
- [ ] Word count tool
- [ ] Dictionary tool
- [ ] Thesaurus tool
- [ ] SAS Writing Reviser

3. Why did you choose these tools? Please explain your answer for each tool separately. *
4. Describe a challenge you faced while using each tool. How did you overcome that challenge? *


5. At what stage in the writing process did you use digital tools? Check all that apply. *
   
   Check all that apply.

   - [ ] Prewriting
   - [ ] Drafting
   - [ ] Editing
   - [ ] Revision
   - [ ] Publishing

6. Explain why you choose to use digital tools at each stage of the writing process checked. *


7. Explain how the use of digital tools impacted your ability to complete this assignment. *


8. Give an example of how a digital tool helped you overcome a challenge during the completion of this writing assignment. Be sure to name the tool. *
9. Which digital tools do you believe help you improve your writing the most? *
   
   Mark only one oval.
   
   ☐ Research tool in Google Docs
   ☐ Translate tool in Google Docs
   ☐ Voice typing tool in Google Docs
   ☐ Grammarly
   ☐ Graphic organizer tools like Google Draw
   ☐ EasyBib citation tool
   ☐ Comments tool in Google Docs
   ☐ Word count tool
   ☐ Dictionary tool
   ☐ Thesaurus tool
   ☐ SAS Writing Reviser
   
10. Explain why you found this tool the most helpful. *
APPENDIX C

INTERVIEW PROTOCOL

Survey number: Date and time
Interview number:

Demographic information from the initial survey.

Script
Thank you for completing the survey. This follow-up interview will take about 20-30 minutes and will include information regarding your experiences with using digital writing tools during the writing process. All of your responses are kept confidential. Anything you tell me will not be personally attributed to you in the findings of this study. This information will only be used to develop a better understanding of student attitudes about the utilization of digital writing tools during the writing process.

I would like your permission to record this interview, so I may accurately document the information you convey. Your participation in this interview is completely voluntary. If at any time you need to stop or take a break, please let me know. You may also withdraw your participation at any time without consequence.

Do you have any questions or concerns before we begin?

1. How would you describe your writing process?
2. Is there a part of the writing process that you find more difficult than others? Why?
3. How would you describe your use of digital writing tools during the writing process?
4. What do you think are the benefits of using digital writing tools during the writing process?
5. What do you think are potential challenges of using digital writing tools during the writing process?
6. What digital writing tools do you use most often during the writing process?
7. For what purpose do you use this tool?
(repeat follow-up question for each tool the student mentions)
8. Why are you most likely to use digital writing tools during the writing process?
9. What influences your decision to use a digital tool?
10. How do discover potential digital writing tools to use for writing?
11. Describe your favorite digital tool to use when writing.
12. Why is this tool your favorite?
Are there any additional comments you would like to add?

Thank you for participating in the interview process. Remember, your responses will be kept confidential and the information you have shared with me will not be personally attributed to you in the findings of this study.
APPENDIX D

THEME ORGANIZER
APPENDIX E

IRB APPROVAL LETTER

UNIVERSITY OF SOUTH CAROLINA

OFFICE OF RESEARCH COMPLIANCE

INSTITUTIONAL REVIEW BOARD FOR HUMAN RESEARCH
APPROVAL LETTER for EXEMPT REVIEW

Key Sellers

Re: Pro00064061

Dear Ms. Kay Sellers:

This is to certify that the research study Digital Writing Tools: A Mixed-Method Analysis of High School Students' Experiences Using Google Apps for Education to Support Their Writing Processes was reviewed in accordance with 45 CFR 46.101(b)(1), the study received an exemption from Human Research Subject Regulations on 11/9/2018. No further action or Institutional Review Board (IRB) oversight is required, as long as the study remains the same. However, the Principal Investigator must inform the Office of Research Compliance of any changes in procedures involving human subjects. Changes to the current research study could result in a reclassification of the study and further review by the IRB.

Because this study was determined to be exempt from further IRB oversight, consent document(s), if applicable, are not stamped with an expiration date.

All research related records are to be retained for at least three (3) years after termination of the study.

The Office of Research Compliance is an administrative office that supports the University of South Carolina Institutional Review Board (USC IRB). If you have questions, contact Lisa Johnson at lisaj@mailbox.sc.edu or (803) 777-8670.

Sincerely,

Lisa M. Johnson
ORC Assistant Director and IRB Manager
APPENDIX F

DISTRICT AND SCHOOL APPROVAL LETTER

On behalf of [blank] High School and [blank] County School District, I am writing to grant permission for Kay Sellers, a doctoral student at the University of South Carolina, to conduct her action research study titled, "Student Perceptions about the Use of Google Apps for Education (GAFE) to Support Stages of the Writing Process" at [blank] High School.

I understand that the purpose of the research study is to describe students’ experiences with using digital tools in Google Apps for Education (GAFE) to support the different stages of the writing process in English classes at [blank] High School in [blank] South Carolina. The action research will use convergent mixed methods design. Quantitative data will come from surveys while a combination of surveys, interviews, and student reflections will yield qualitative data.

The researcher has informed me that students and parents in her English classes will be informed of the research. Students and parents in the researcher's class must sign consent letters before students may participate in the study. The students' names will not be used and individual students will not be identifiable in any written reports about the study. In addition, I understand that the school or district will not be identifiable in any written reports about the study.

The results of the research will provide critical insights that will inform the researcher’s future teaching practices, and the researcher will share those insights with her collaborative network including the district’s English curriculum team, the district’s EdTech Task force, and conferences. Also, I have been informed that a report of the findings will be made available to the school as well as the district.

Best regards,
[blank]
principal