2018

Exploring The Role Of Schema Development And Its Impact Within The Digital Vocabulary Application Quizlet

Jana M. Tolleson
University of South Carolina

EXPLORING THE ROLE OF SCHEMA DEVELOPMENT AND ITS IMPACT WITHIN THE DIGITAL VOCABULARY APPLICATION QUIZLET

by

Jana M. Tolleson

Bachelor of Science,
University of South Carolina, 1993

Master of Education
University of South Carolina, 2011

Submitted in Partial Fulfillment of the Requirements

For the Degree of Doctor of Education in

Curriculum and Instruction

College of Education

University of South Carolina

2018

Accepted by:

Christopher Bogiages, Major Professor

Rhonda Jeffries, Committee Member

Suha Tamim, Committee Member

Toni Williams, Committee Member

Cheryl L. Addy, Vice Provost and Dean of the Graduate School

Dedication

Completing my doctoral degree has been the most challenging educational learning experience of my life. I would like to dedicate this to my husband Keith, who supported me not only financially but also emotionally by encouraging my academic perseverance. Thank you for being by my side and sacrificing so that I could purse my goal. It has been your examples of hard work, loyalty, and integrity as well as your constant encouragement that has guided me. To my son Tyler, who inspired me to attain this degree, at any age, and for always giving of his time and his insight to a concept with which I was struggling. To my daughter Britt, for constantly telling me how proud she is of me and to her and her husband Tommy for giving me Baby Harvey to totally refocus my life. There are not words to express my gratitude and love. You all have seen me through moments of joy and sorrow, and are responsible for allowing me to emerge stronger and with a firm hold on Christ's love and direction in my life. This work is as much your success as it is mine.

And most importantly, to my Lord and Savior, you have brought me out of the miry clay and called me to this life. Each step has been divinely orchestrated and only through you was all of this possible.

Acknowledgments

I would like to acknowledge those without whose guidance and support this work would not be possible. I would like to thank Dr. Rhonda Jeffries for her valuable guidance and advice as my dissertation and program chair. Thank you for your continued support throughout my graduate school journey and dissertation preparation. I appreciate your positive outlook and caring and compassionate nature. You have been a continuous example of enthusiasm for my work and have demonstrated your compassion for students through me. I would also like to thank Dr. David Virtue for his pivotal role and collaboration. Thank you for your listening ear, guidance, and your professional support. I could not have gotten to this point without Dr. Jeffries' and Dr. Virtue's passion for fairness and what is ethically right. To Dr. Edward Cox, a special thank you for letting me participate in the Educational Leadership Superintendency core to fulfill my cognate requirements. I would like to thank Dr. Erin Besser for helping me with my IRB submission, for encouraging me in my writing abilities, and for teaching me where true learning starts.

Thank you to my principal Dr. Thomas Rivers and assistant principal and friend Jessica Robbins for providing a teaching position and schedule that complimented and supported the three years it took to complete my doctoral program and dissertation, and for giving me the time away from school to accomplish my goals. I would like to extend

a special thanks to Dr. Shane Phillips and the district research committee for helping me plan and for approving my action research study.

I would like to thank Wilma Sims and Dr. Brian Habing in the Statistical Data Lab for her time and patience while providing me with invaluable information that eluded others. A final thank you to Jennie Noakes who not only copy-edited and formatted my work but coached me in the preparation of my dissertation.

Abstract

The purpose of this action research study was to ascertain the possible impact of using schema development strategies and the digital application Quizlet on student learning perspectives and achievement in a mid-level social studies classroom. U.S. schools are highly influenced by state standardized testing based on standards-driven curriculum that reinforces basic recall and recognition. School curriculum should be focused on higher-level thinking skills such as critical thinking, social negotiation, and self-directed learning. The identified problem of practice of this study explored and described the use of technology at a basic level. Students are exploiting technology by copying and pasting information instead of constructing their own knowledge. Students are relying on rote memorization instead of using strategies that promote the construction of new schemata. The study was conducted in my seventh-grade iCivics classes in a large southeastern middle school through collaborative groups that fostered social negotiation. In the study, students constructed their own learning by using schema development strategies that would then be used when required to think critically on summative assessments. Specifically, students constructed their own learning using the teacher-modeled schema-developing strategies and used the flashcard-making application Quizlet as a note taking device to provide evidence of their newly acquired higher-level thinking. Students also used Quizlet as a formative tool to become self-directed learners. Students' perspectives on the use of Quizlet and its impact on their academic success were also explored.

Quantitative and Qualitative data were collected in the forms of a pilot study, informal interviews, pre- and posttest, pre- and post surveys, and summative test.

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction

At first, I thought there must have been a full moon! The students were extra energetic, the way they get when there is a full moon. But it wasn't a full moon—the students were beside themselves with excitement because today was the day of the one-to-one roll out of the district's iPad initiative. This initiative supplied personal iPads to every student, enabling them to be creative, collaborative, critical thinking, communicators of the 21st century. For example, they would be able to create videos and electronic presentations, take notes and photographs, and, perhaps most importantly, do their homework, regardless of whether they had access to computers or the Internet at home. Students who did not have access to a computer at home would now be able to complete assignments digitally. Most exciting for me as a teacher, however, was that future lessons could integrate technology easily accessed via the iPad. The hope was that the Apple iPads would enable more students to become 21st-century learners and become technology literate in their graduating workforce.

But, the students had a different reason for excitement: They were excited about the games. I remember one eager student saying, "OMG, look at all the games we can download!" My heart sank as I realized that the iPad would be used for entertainment instead of for educational purposes. At the first collaborative planning meeting after the

roll-out, I learned this was also a concern for other teachers. I began to wonder: How can I use this interest in digital gaming to my advantage?

In the weeks after the roll-out, my colleagues and I began to see an important pattern: Students were doing well on formative assessments but not as well on summative assessments pertaining to the same content. In the context of my own classroom, I experienced this disconnect with regard to vocabulary. Students in the district are encouraged to create electronic flashcards for studying state-mandated curricular information in social studies. For example, throughout the academic year, middle-level social studies students are taught prescribed social studies vocabulary concepts related to the state-mandated social studies curriculum, which they record on flashcards for easy memorization. After the introduction of iPads in the classroom, all teachers were asked to switch from having students hand-write vocabulary flashcards to using a downloadable application called Quizlet. Quizlet is an online application that allows students to study vocabulary concepts using flashcards and games. There are seven study modes: Learn, Spell, Write, and Test, Match, Gravity, and Quizlet Live. Match, Gravity, and Quizlet Live are games designed especially to appeal to students. Teachers and students can track their progress and adjust their learning. There is also audio available, which will speak the term and its associated meaning in 18 different languages. Students can study their vocabulary concepts anywhere with downloadable applications on an Apple iPad or iPhone.

Although most students were successfully using Quizlet to generate their vocabulary flashcards and were doing well on formative quizzes, they were unable to apply this learning to higher-order questions on summative assessments. After

recognizing this pattern, I began to monitor how students in my class were using Quizlet. I discovered the students were copying and pasting basic definitions to the programs' electronic flashcard generator. They were relying on rote memorization of the basic definition of the vocabulary to do well on formative assessments. My challenge became finding a way to refocus their learning from rote memorization to a higher order of learning so they would perform better on summative assessments. Schema development strategies seemed to be the obvious choice.

The purpose of this action research study was to examine how students construct their knowledge of essential vocabulary concepts by using schema development strategies and integrating technology to assist in the transfer of knowledge without memorization. Specifically, this study examined the way mid-level social studies students use the study modes and games of the flashcard-making application Quizlet to record and self-study the new schemata built through strategies modeled by the teacher-researcher. It also attempted to discover how the full use these strategies and of Quizlet (a) impacted student achievement and (b) affected student perceptions of achievement.

Problem of Practice

The problem of practice addressed in this action research study involved the use of technology in the social studies classroom. Students are using technology at a basic level, one that does not promote schema development of vocabulary. This study examined the way students constructed their own knowledge using schema development strategies and their use the flashcard-making application, Quizlet, to acquire higher-order thinking skills and aid in the transfer of information, respectively. The purpose of this

research study was to examine how students used schema developing strategies to construct their knowledge of essential vocabulary concepts necessary to do well on summative assessments using Quizlet as a formative tool. This research was an attempt to find out if and how the full use of Quizlet would impact student achievement. What emerged from this study was a new understanding of how students chose to use Quizlet and how they constructed their own schema of vocabulary concepts.

Theoretical Framework

Vocabulary building—the process of learning vocabulary—is the basis of all learning. If a student does not understand the technical language involved in a disciplinary curricular unit, they cannot do well when being assessed formatively, much less summatively. Anderson and Nagy (1993), in their technical work "The Vocabulary Conundrum," stated that experienced teachers are aware that students with a small vocabulary are unlikely to be good readers or understand what they read: "having a small vocabulary portends poor school performance and, conversely, that having a large vocabulary is associated with school success" (Anderson & Nagy, 1993, p. 2). In their technical report, Anderson and Nagy further claimed that a high level of vocabulary knowledge is highly correlated with high scores on standardized tests and intelligence testing, so much so that a wide-range vocabulary test could be used in place of a full IQ test (Anderson & Nagy, 1993, p. 2).

Anderson and Nagy (1993) described one weakness of the conventional approaches to learning vocabulary as one of definitions:

> Although definitions play an important role in most vocabulary instruction, educators tend seriously to underestimate (a) the difference between knowing a definition and knowing a word, (b) the shortcomings of many of the definitions found in glossaries and school dictionaries, and (c) the difficulty that students have interpreting definitions. Vocabulary instruction that promotes *word consciousness*, a sense of curiosity about word meanings, appreciation of *nuances of meaning*, *independence in word analysis*, and wide, regular reading appears to be superior to conventional instruction. (Anderson & Nagy, 1993, p. 1, emphasis mine)

Word consciousness, appreciation for nuances of meaning, and independence in word analysis provide the difference between rote memorization and schema development. Anderson and Nagy used as an example the words "look," "see," "glimpse" and "glance"—all of these words are used when a person is looking at something. But "to look," "to see," or "to glimpse" might mean only a momentary look, whereas "to glance" suggests a hurried look and "to see" might imply to understand. Students who develop word consciousness sensitivity learn from examining these differences and are able to develop independent word analysis by reconstructing new schemas. In this action research study, I am advocating for vocabulary instruction that promotes word consciousness—understanding how the parts of words contribute to their meaning—by challenging students to formulate a new schema about the meaning of words from an existing schema and what they can infer from pertinent informational text. Students who can appreciate the nuances of words or the subtle differences in vocabulary words learn

from examining and attempting to express the differences in meaning among related words.

Cognitive development theory, which includes schema development, is one explanation for how students learn vocabulary. According to Rumelhart and Norman (1976), "schemata are the building blocks of cognition" (p. 32). The schema development strategies of accretion, tuning, and reconstruction guide vocabulary instruction and are constructivist in nature because they are student centered and similar to constructivist teaching steps. In constructivist teaching, the steps of orientation, elicitation, and restructuring align with these schema strategies. During orientation, aligned with accretion, the existing schema is activated as the purpose and motivation for learning as new vocabulary concepts are introduced. The elicitation step, aligned with accretion and tuning, clarifies ideas or criteria for the new vocabulary concepts and adds new information to the existing schema. The third step, restructuring ideas, is at the heart of constructivist learning and is aligned with restructuring in schema theory, carrying the same name. The vocabulary meaning is clarified and expanded as each student independently interprets, explores, and evaluates a variety of ideas to reconstruct new schema.

This study was informed by cognitive development theory, schema theory, and constructivist theory, specifically constructivist e-learning. Through these theories, I used the schema developing strategies and best practices for constructivist e-learning concurrently to guide instruction. These gave me a framework for creating my lesson plan introducing seven types of propaganda. The constructivist teaching steps helped me in developing and implementing the lesson. I used the schema theory strategies to analyze

student documents as evidence for use of tuning and reconstruction to judge whether students had developed a new schema.

Cognitive Development Theory

Jean Piaget first developed the idea of cognitive development theory when working with students at the Binet Institute. Cognitivism is a theory that views learning as the acquisition or reorganization of cognitive structures through which students process and store information. Cognitive theorists describe learning as a mental activity that involves internal coding and structuring by the student; therefore the learner is an active participant in the learning process. The foundation of cognitive theories focuses on how information is received, organized, stored, and retrieved (Ertmer & Newby, 1993). Learning is a complex process of attention and memory, and it is important to understand the foundations and assumptions of cognitivism to determine how to design instruction so that information can be readily assimilated (Ertmer & Newby, 1993). The cognitive approach focuses on mental activities of learners, such as mental planning, goal setting, and organizational strategies as factors influencing learning. It also suggests there is a disconnection between educational pedagogies and the use of appropriate instructional design to facilitate learning in the most efficient and effective manner possible (Ertmer & Newby, 1993).

These cognitive structures—key concepts of cognitive theory—are called schemas. A schema is an internal knowledge structure or unit of information. When new information is presented to a student, the student combines, extends, or alters an existing schema to accommodate new information. To develop this new schema, the new

information goes through the three stages of information processing: sensory register, short-term memory, and long-term memory (Mergel, 1998).

New information enters the sensory register from the five senses, which lasts only a few seconds. If not acted upon, it decays or is replaced with newer information. If information is important or interesting enough, this sensory input transfers from the sensory register to short-term memory, and if it is rehearsed repeatedly or chunked into meaningful parts, it is transferred to long-term memory. The information is stored by rote memorization, over learning, or by deeper levels of processing such as linking old schemata to new schemata for successful retention in long-term memory's unlimited capacity (Mergel, 1998). This process of information acquisition is known as the cognitive information-processing model (CIP), and it is compared to how a computer processes information (Saettler, 1990, cited in Mergel, 1998).

Schema Theory

This action research study is primarily framed by an understanding of schema development. Schema theory attempts to address how we actively make meaning of information. A schema is a mental structure representing concepts stored in long-term memory. Schemata, the plural of schema, are composed of generic or abstract knowledge, used to guide encoding, organizing, and retrieving of information. It is a reflection of experiences encountered by an individual, integrated over many instances of interaction with a specific concept. A schema can be formed and used without an individual's conscious awareness, but once it is formed, it is thought to be relatively stable over time.

Schemata are shared across individuals who share the same culture, but they are reflections of an individual's experience (Driscoll, 2005).

Schemata are created through experiences with people, objects, and events in the world. As we experience something repeatedly, we develop an expectation about a concept, more than the definition, which includes details that will invoke the schema the next time we encounter the same concept or something similar (Driscoll, 2005). There are three proposed processes to account for the modification of schemata that leads to learning: accretion, tuning, and restructuring. *Accretion* is the process of learning facts like lists, names, telephone numbers, and vocabulary definitions. Accretion can also be when information is retrieved from memory without altering an existing schema. The process of *tuning* is more significant to learning and involves making changes to the existing schema gained through accretion to interpret new information. When an individual encounters new information or experiences, she may not be able to fully understand it until she uses the process of tuning to modify the information under an existing schema. Learning through *restructuring* is the most important and most difficult process. In this process, new structures are created to interpret the information or experience. If the new information cannot be accommodated by tuning an existing schema, then an individual is forced to create a new schema. The restructuring process takes considerable time and effort, requiring elaborate interconnections to be developed within the memory system of the learner (Rumelhart & Norman, 1976). I used schema theory as the basis for my study because knowledge is represented in long-term memory as packets of information called schemata, and students using existing schemata to interpret a vocabulary concept are developing a more complex schema through personal

experiences and constructing their own learning. In this action research study, students created new vocabulary schemata pertaining to types of propaganda to educate them in the types they will encounter in their everyday lives. These more sophisticated vocabulary schemata should increase comprehension and reasoning to help improve summative scores and develop their civic voice.

Constructivist Theory

Constructivism is derived from multiple ideologies, especially the developmental perspectives of Piaget (Piaget & Cook, 1952) and the interactional and cultural emphasis of Bruner (1956) and Vygotsky (1978) with the contextual nature of learning they emphasized. The philosophies of Dewey (1933) and Goodman (1984) greatly influenced constructivist researchers. There is no single constructivist theory of instruction, but it is based on the assumption that knowledge is constructed by learners as they attempt to make sense of their experiences (Driscol, 2005).

Constructivist theory supports the goals of my district that incorporate 21st-century learning skills creativity, collaboration, communication, and critical thinking. A constructivist learning environment is student centered, and the teacher facilitates a process of learning in which he encourages students to be responsible for their own learning. The teacher accomplishes this by modeling, coaching, and scaffolding throughout the lesson. These are also the goals of 21st-century learning skills (National Education Association, n.d.).

Students integrated technology in collaborative groups, building on what they already know, their existing schemata through questioning current issues such as “fake

news," and the role it plays in developing one's own civic voice. Assessment consisted of pretesting and technology integration to determine what knowledge students currently know about a unit of study and encourage students to integrate technology as a formative assessment tool. There are six core values of constructivism:

1. Learning outcomes depend not only on the learning environment but also on the knowledge of the learner.
2. Learning involves the construction of meanings. Meanings constructed by students from what they see or hear may not be those intended.
3. The construction of meaning is a continuous and active process.
4. Meanings, once constructed, are evaluated and can be accepted or rejected.
5. Learners have the final responsibility for their learning.
6. There are patterns in the types of meanings students construct due to shared experiences with the physical world and though natural language. (Matthews, 1994)

Schema theory is at the center of these values.

The steps of constructivist teaching align with schema theory's three strategies of learning new concepts: accretion, tuning, and restructuring. The first step is orientation, which aligns with accretion, where the purpose of learning is explained. This should also provide the motivation for learning. The next step is elicitation, which aligns with tuning, where ideas are clarified or criteria for the topic are established. The third step, restructuring ideas, aligns with restructuring of schema and is at the heart of constructivist learning and teaching. During this step, meaning and vocabulary are clarified and expanded and a variety of interpretations are explored and evaluated before

constructing new ideas. In the next step, these ideas are applied through discussion, formative assessment, and summative assessment. In the final step, student learners reflect on how their ideas of the original concepts have changed or developed (Matthews, 1994).

Purpose of Study

One-to-one computing is an expensive endeavor. The goal of the district's one-to-one initiative was twofold: first to provide each student with their own computing device so that socioeconomically disadvantaged students would have access to a personal portable computing device and could download free or district-purchased applications to their Apple iPads for use at home that do not require the Internet. Second, as part of their 21st-century skills initiative, the district wanted to integrate technology in learning to develop digital literacy and to increase student achievement that they hoped would be evident through summative assessments and eventually increase achievement on state-mandated tests. Although it is impossible to research all of the possible advantages of one-to-one computing, the present action research study sought to discover the impact of the effective use of Quizlet on student achievement, specifically how it avails itself to record evidence of schema development strategies used to construct knowledge and student perceptions of achievement.

Research Questions

The purpose of this action research study was to examine how students construct their knowledge of essential vocabulary concepts. Specifically, this study examined the way mid-level social studies students constructed their knowledge of propaganda

concepts using the schema development strategies of accretion, tuning, and restructuring evidenced by what they recorded on the flashcards. Also it examined the effective use of the seven study modes and games of the flashcard-making application Quizlet to assist in the transfer of knowledge. It also attempted to discover how they (a) impacted student achievement and (b) affected student perceptions of achievement. The following research questions were explored during the study:

1. How does using schema development strategies impact student achievement?
2. How does the effective use of Quizlet as a formative assessment tool impact student achievement?
3. How do students perceive the use of Quizlet on their academic success?

As the teacher-researcher, I followed Mertler's (2014) action research process and used convergent mixed-methods to approach these research questions both quantitatively and qualitatively.

Methodology

Action Research

This action research study uses a convergent mixed-method design exploring qualitative and quantitative educational research. Specifically, I used Mertler's (2014) action research process: "Action research is defined as any systematic inquiry conducted by teachers with a vested interest in teaching and learning process or environment for the purpose of gathering information about how their particular schools operate, how they teach, and how their students learn" (Mertler, 2014, p. 4). Action research is a process

that improves education by incorporating change after improving one's own practice. It is done by teachers, for teachers, and in collaboration with other teachers. Action research is a cyclical process of planning, acting, developing, reflecting, and justifying one's own teaching practices (Mertler, 2014). Action research is not the same as empirical research. I chose to use action research for this study because it is open-minded: It explores, discovers, and works to find creative solutions to educational problems while examining the instructional process and its effects on student learning (Mertler, 2014). Action research is different from traditional research, particularly empirical research, which has the goal of generalizing the findings to the larger population. This is not the goal of action research, which cannot be generalized to a population.

As teacher-researcher, I used Mertler's (2014) four stages of action research to guide the design of the study. Stage 1 revolves around identifying the problem of practice, conducting research on and reviewing related literature, and planning the action research. Stage 2 requires implementation of the plan and collection and analysis of the data. Then in the next stage, the teacher-researcher makes changes to the teaching environment based on the findings, which may extend to other core subjects and eventually school and district wide but is not generalizable to the larger population. The final stage is one of sharing and reflecting by communicating the results of the action research to the stakeholders and hopefully sharing the results at a professional conference or in an academic journal (Mertler, 2014).

Planning. In implementing Mertler's (2014) Stage 1, I (as teacher-researcher) identified and limited the topic, gathered information by gleaning the perspective of

teachers and administrators, and reviewed and will continue to review related literature to help me "make informed decisions about the research focus and plan" (p. 40).

Evolution of the research focus. As a 23-year veteran teacher, I have implemented various initiatives aimed at increasing student achievement. One-to-one computing is the latest and greatest and probably the most expensive initiative being implemented in my district. The one-to-one initiative has not been the savior it was thought to be. Yes, students will be prepared to compete in the future technological career world, but is student achievement increasing because of this implementation? Students are more motivated to learn with this technology but seem to be exploiting the technology with the ability to copy and paste information to complete assignments instead of constructing their own meaning of informational text. Student achievement on summative and mandatory state tests has not increased, according to preliminary data provided by the district for current students. This identified problem of practice lead to a review of the literature (see Chapter 2) that points to the irony of the initiatives' use of a traditional method of drill and practice, using flashcards to study, via a technology application called Quizlet. This, in turn, allowed me, as teacher-researcher, to narrow the focus of the action research questions for this study.

Development of the research plan. Step 2 of the Mertler's planning stage is to develop a research plan. To explore and discover possible answers to the research questions—How does using schema development strategies impact student achievement? How can the effective use of Quizlet as a formative assessment tool impact student achievement? And how do students perceive the use of Quizlet on their academic success?—I identified the variables as schema development strategies, efficient Quizlet

use, and student achievement as measured on a summative test. The explanatory variables are schema development strategies and the efficient use of Quizlet, and the response variables are a posttest and summative assessment created and used by the iCivics teachers in my district and iCivics.org. There was one treatment group of 48 seventh-grade students. Student achievement was measured by comparing data gathered from a pre- and posttest and a summative assessment through one unit of study, which lasts approximately two weeks. The test was the same for the pre- and posttests (Appendix A) and was a matching question format, and the post summative was an application of the vocabulary concepts learned through answering questions pertaining directly to pictorial examples (Appendix B).

Ethical considerations. Dana and Yendol-Hoppey (2014) stated, "keeping caring, fairness, openness, and truth at the forefront of your work as a teacher-inquirer is critical to ethical work" (p. 150). This statement put my mind at ease, as possessing these four characteristics in the classroom will easily translate into the core of this action research. Mertler (2014) emphasized, "that action research adheres to ethical standards is a primary responsibility of the educator-researcher" (p. 106). Bearing the primary responsibility of adhering to ethical standards starts with the ethical treatment of students, parents, and colleagues.

My district has a rigorous application process for action research, which stresses obtaining written parent and student permission when using student data and/or work samples in academic papers and publications as in the current course requirement. Mertler (2014) referred to these as *informed consent*, which describes what the study is about and what will be asked of the participants. This is also known as the "principle of

accurate disclosure" because the word "accurate" implies that intentionally deceiving participants should be avoided (Mertler, 2014, p. 108). Parents were asked to sign a parent consent form (Appendix M) and the students signed an assent form (Appendix L) that complied with Family Educational Rights and Privacy Act (FERPA) and Protection of Pupil Rights Amendment (PPRA) guidelines. They were guaranteed confidentiality and anonymity and assured that participation in the study was voluntary and that it could be terminated at any time without penalty. Students and parents were also assured that participation would not affect the students' grade and that the data will be kept secure and confidential. My district requires that the researcher respect the privacy, informed consent, and due process rights of students and its employees. They also require the researcher to provide the district with a copy of the completed research.

Dana and Yendol-Hoppey (2014) described inquiry as a natural and normal part of ethical teaching. They stated that teachers normally look at student work for progress or the lack thereof, and adjust their instruction, intermittently analyzing student scores to help students master goals and objectives to reach their highest potential. They also explained that ethical teachers naturally observe students' behaviors and ask questions to check for understanding that guides the teacher in instructional decisions of adjusting teaching pedagogy. These natural and normal activities that good and ethical teachers engage in easily translate into the stages of action research. According to Dana and Yendol-Hoppey (2014), "choosing not to engage in the inquiry process as described can almost be viewed as unethical" (p. 149). They did caution teachers about letting action research negatively affect teaching when conducting research.

Acting. The second stage of Mertler's (2014) action research process is the acting stage. During this stage, data is collected and is analyzed. In this quantitative part of the study, one group's pretest-posttest research study data was collected and analyzed to determine the impact of the explanatory variable on the response variable, schema development strategies, and effective use of Quizlet on student achievement. Statistical analysis was used to ascertain the impact.

Sample. Sampling is the process of selecting people from a population of interest. The study sample of the current action research study is one of convenience because it was carried out with students who are in my seventh-grade iCivics exploratory course.

Sources of data collection. Students took a pre- and posttest in the format of matching questions and a post summative test was an application of the vocabulary concepts learned through answering questions pertaining directly to pictorial examples of propaganda. The pretest accessed their current knowledge about propaganda vocabulary before the unit of study. After the unit of study, students were given the same test as a posttest to measure achievement based on the scores received. Comparing the pretest score to the posttest score of students determined the level of achievement. The pretest and post summative summative assessment were also compared and analyzed.

Statistical analysis. "Descriptive statistics are simple mathematical procedures that serve to simplify, summarize, and organize relative large amounts of data" (Mertler 2014, p. 169). Descriptive statistics were used to analyze the quantitative data gathered to ascertain the impact of the exploratory variables on the response variable and used to substantiate change in future pedagogy. The surveys were analyzed to look for themes that may exist that would suggest future changes.

Developing. The developing stage is the third stage of Mertler's (2014) action research process, and this is when, as teacher-researcher, I acted on the findings of the study. If the exploratory variables have a positive impact on achievement, I will continue to encourage students to use the interventions. Any difference in outcome from the data warrants a suggestion for change or new action plan for future pedagogy.

Reflecting. The fourth stage in the action research process is reflecting. Mertler (2014) stated that for a teacher to "critically examine her or his practice, that person must engage in systematic reflection on the practice" (p. 44). This is when the teacher-researcher communicates the results of the action research study. I summarized the findings of the study, decided how to share the findings, and reflected on the process by "introspectively examining" (p. 258) the practices studied. "There is a tendency for teacher-researchers to feel intimidated at the thought of presenting or publishing their research … as human beings, none of us likes to feel the wrath of our critics" (p. 245). Dana and Yendol-Hoppey (2014) used an analogy of stones beside a pond, with the stone representing action research and the pond representing professional conversation:

> Unshared teacher inquiry is like a stone lying beside the pond. However, once tossed in, the inquiry disturbs the status quo of educational practices, creating a ripple effect, beginning with the teacher … emanating out to a school, a district, a state, eventually reaching and contributing to … the profession of teaching itself. (Dana & Yendol-Hoppey, 2014, p. 236)

Research Design and Data Collection Methods

In this action research study, I used a convergent mixed-method research design consisting of both quantitative and qualitative approaches. I chose a mixed-methods

design because, according to Mertler (2014), "the combination of both types of data tends to provide a better understanding of the research problem than one type of data in isolation" (p. 12). These methods are appropriate for the research question because "the main goal of action research is to address local-level problems with the anticipation of finding immediate solutions" (p. 12).

Research design—Research Question 1. The first question was quantitative in nature: How does using schema development strategies impact student achievement? I am studying my own students within my particular classes who are struggling with constructing their own schemata and performing poorly on summative assessments. During the lesson, I, as teacher-researcher, modeled schema-developing strategies that aligned with Rumelhart and Norman's (1976) modes of learning accretion, tuning, and restructuring. Students were encouraged to emulate the modeled strategies to construct their own knowledge and tune their individual schema. The students' newly constructed schema information was typed onto the flashcards in Quizlet.

Data collection methods—Research Question 1. Quizlet allows students and teachers to print out sets of flashcards. I was able to print out each student's flashcard sets and analyze them to identify which strategies the student used. An example of a student's flashcards can be seen in Appendix B. A frequency distribution chart was designed based on the modeled strategies of schema development (Appendix K). Students whose cards provided evidence of using all five strategies were chosen as a subset to compare their summative assessment score to the pretest score and schema development frequency distribution (Appendix K).

Research design—Research Question 2. The second question is: How does the effective use of Quizlet as a formative assessment tool impact student achievement? I had to ask what formative assessments would be motivating, engaging and based on 21st-century characteristics and be constructivist in nature. Today's students are digital natives (Prensky, 2001): They learn from a very early age how to use technology, and integrating it into instruction is the natural experience for today's learner. This is why Quizlet was chosen as a formative tool for this action research study. I chose the online application of Quizlet to be used by the students as a formative tool to see if its study modes and games could impact my students' achievement on summative assessments. By answering my research questions, I can see if my students' scores on their pretest change on the posttest after having using Quizlet.

Data collection methods—Research Question 2. A number of data-collection methods were used to examine how the effective use of Quizlet assisted in the transfer of knowledge beyond memorization to impact achievement. These data collection methods were a pre- and posttest (Appendix A), student pen-and-paper summative assessment (Appendix I), and Quizlet use frequency data (Appendix J).

Research design—Research Question 3. Research Question 3 addressed the student perceptions of technology integration on student achievement: How do students perceive the use of Quizlet on their academic success? In this action research study, my students used the iPad application, Quizlet, to record and study their individual schema for vocabulary concepts pertaining to a classroom unit on propaganda. Quizlet's major function is to provide a technology application to create digital flashcards. Flashcards give students an opportunity to use self-practice, enabling them to later answer a question

requiring higher-order thinking skills by recalling information from the schema they have constructed. Quizlet is a free website that allows users to study flashcards with provided study and game modes. The application is downloaded on the iPad from the district's app catalog and does not require access to the Internet to be used. Quizlet was an appropriate choice for this study because it is easy to use, the teacher can use back-end features to record student activity and see how students are using the application, and it gives teachers the ability to track student progress over time (Quizlet, 2014). The study modes and games also reinforced the schema learning strategies of accretion, tuning, and restructuring and assist in transferring of knowledge instead of relying on rote memorization.

Data collection methods—Research Question 3. Two student perceptions surveys were designed on Survey Monkey consisting of 10 questions each. Both surveys are closed-response rating scales where students select one or more responses from a set of options provided to them. These data collection methods were a student perception survey (Appendix C) and student perception post survey (Appendix D). A quantitative pilot study informed the construction of the questions on each survey. As with Research Questions 1and 2, I used a convergent mixed-methods approach to answer Research Question 3. A pilot study was conducted prior to creating the survey and then pilot tested on 10 students in one of my classes not involved in the study. From this pilot, I can draw conclusions about a potential impact of the final surveys. The pilot study consisted of asking open-ended questions to a smaller group of similar students and using their responses to write the pool items for the pre and post survey. I constructed 20 preliminary questions and prepared the instrument for the pilot test. I administered the pilot test and

debriefed with the students to make changes based on their feedback. I then revised existing items and develop new items. A pilot test is a procedure in which a researcher makes changes in an instrument based on feedback from a small number of individuals who complete and evaluate the instrument (Creswell, 2005). Surveys provide a quantitative or numeric description of student perceptions of that population (Creswell, 2013). Student perceptions and input through these surveys will be part of the foundation to future change in lesson planning.

Throughout the data collection process, I found myself asking grouped students many spontaneous questions as a part of my daily interactions with them. Hubbard and Power (2003, cited in Mertler, 2014, p. 134) reminded teacher-researchers not to forget the value of informal interviews. These informal interviews informed the postsurvey, as I was able to ask the entire sample the questions in a formal process yielding data.

Validity, Reliability, and Trustworthiness

In order to ensure reliability, validity, and trustworthiness, I used an established design suggested for action research. I used a convergent mixed-methods design, collecting both quantitative and qualitative data at about the same time and giving them both equal emphasis (Mertler, 2014). Combining the strengths of each form of data in order to understand the research problem "leads to greater credibility and overall findings to the extent that the two sets of data have converged and indicated the same or similar results" (Creswell, 2005). The pretest and posttest, pen-and-paper summative assessment, the pilot study, the student perception surveys, and the student flashcards created on Quizlet are sources of validity and trustworthiness. The students were given a pretest and

the same test as the posttest and a summative assessment that was developed by the iCivics teachers in the district or iCivics.org. Students throughout the district in iCivics classes have been given this test in the past, and it has been proven reliable by past scores reflecting a bell shaped curve, representing stability and consistency. Reliability and validity are interconnected, so tests have to be reliable in order for the interpretation of the scores to be used as sound evidence to demonstrate that the test matches its proposed use, or is valid. The pretest and the posttest were administered at two different times to the same participants after a two-week unit of study. The data provided by the student perspective surveys also increases the validity and trustworthiness of the study by providing me with student views that do not reflect teacher-researcher bias. Student-created flashcards were analyzed to see which students used all five schema development strategies based on the use of accretion, tuning, and reconstruction of existing schema. The pen-and-paper summative assessment scores were then analyzed for the students who used the schema development strategies to provide validity to the findings of the study. The pilot study provided a qualitative component to the study as well as providing validity by being able to construct the survey based on the responses of a similar group of students at least 20% of the sample size. I provided validity to this study by using multiple data sources and multiple data collection methods, and then converging the data into an analysis of findings.

Positionality

Dana and Yendol-Hoppey (2014) described action research as the "third research tradition," one that "focuses on the concerns of the teacher (not outside researchers) and engages teachers in the design, data collection, and interpretation of data around a

question" (p. 8). My role in the current action research study is one of teacher and researcher, where the teacher-researcher generates her own theory from the "research grounded in the realities of educational practice … which makes it more likely to facilitate change based on the knowledge that they create" (p. 8).

I am a veteran teacher with 23 years of experience and have been at the middle school where I undertook this study for the last nine years. I am certified as highly qualified to teach middle school and high school social studies and have taught Psychology 101 at one of the districts local high school for dual college credit. I am also gifted and talented endorsed. I received a bachelor's of science degree from the University of South Carolina (USC) with a double major in history and experimental psychology. I also attained a master's degree in elementary administration from USC. I currently teach iCivics, an Internet-based government class, and ProTeam, the middle school teacher cadet program sponsored by CERRA. I teach three classes of iCivics that are 52-minutes long. I also have a split planning period of two 52-minute periods. iCivics is a semester-long course that prepares students to become self-directed, engaged, 21st-century citizens, understanding and respecting our system of governance. Lessons are planned using the iCivics.org website founded by Justice Sandra Day O'Connor in 2009. The curriculum is standards based and is focused on civic knowledge and the legacy of democracy to help students develop their own civic voice.

Participants

The site where the action research took place is located in the Southeast United States in the midlands of South Carolina. My school district is one of the fastest-growing

districts in the state, ranking eighth in total enrollment. It has 23,953 students and has built 15 new schools since 1997; even with the new schools, there are an estimated 173 portables. My school district's on-time graduation rate is 87.7%, with 71% of graduates attending college. Seventy-one percent of the more than 1,900 teachers have master's degrees or above. The student-to-teacher ratio in core subjects for Grades 6 thru 8 is 22.5 to 1. In 2014, the district received *EXCELLENT* for its absolute rating and for its growth rating. The poverty index for my school district is 52.19% with 16.89% enrolled in the free and reduced lunch program.

The action research study will be completed at one of my school district's seven middle schools, which houses Grades 6–8. This middle school had 1,107 students enrolled for the 2015–2016 school year, and 21.60% of these students receive free or reduced-price meals. The student population is 86% White and 14% diverse ethnicity, supported by 75 teachers, 4 administrators, 1 media specialist, 4 school counselors, 1 interventionist, 1 technology integration specialist, and 35 support staff (Welcome, 2014). The middle school is celebrating its 10th anniversary, and its student population has grown since the school was built, so several exploratory classes are in portables, as is iCivics, one of the courses I am currently teaching. The participants selected for this study consist of seventh-grade students who chose iCivics as one of their exploratory classes. There are two seventh-grade classes of iCivics at the middle school, with approximately 50 students. There were 48 participants in this study, with the majority being boys: 38 boys and 10 girls. Two students receive ESOL accommodations, and two students are supported with resource classes.

Significance and Limitations of the Study

Significance

This research study is significant because it explored how students develop new schemata and use Quizlet as a formative tool to facilitate the acquisition and transfer of knowledge into long term memory with out rote memorization. One-to-one computing and the integration of technological applications are the connective tissue to the larger field of education. This study is only a snapshot of what goes on in one particular classroom, but it can be the beginning of a larger study of technological applications used as formative assessments to impact summative assessments. Teachers of iCivics in our district are the intended audience for this study since the study revolves around a lesson taught in those classes. This study used the SAMR model developed by Dr. Ruben Puentedura (2014) to help educators analyze how effective technology is on teaching and learning. The results of this study point to three problems. The first is that even when coached, most students do not know how to construct their own knowledge. The second is that not only do the students rely on the original copy-and-pasted definition; they reported relying on their teachers to create the original flashcards and the Quizlet Live Game. The third is that students reported that the Quizlet Live Game created by the teachers in other classes emulates the summative tests. Therefore, teachers are teaching to the test, which was not done in this study.

Limitations

Throughout the research process, I strived to minimize limitations, but because of the nature of action research, inevitably they exist. Because I do not have extensive

experience with data collection, the implementation of collection could be considered flawed and biased, which affects its validity. Data was collected by a pretest and posttest, a post summative test, and a pre and post survey. Survey research is one of the most important areas of measurement in applied social research (Trochim, 2006), but there are also limitations to using surveys in action research projects (Mertler, 2014). Analyzing responses can be time consuming, so instead of using open-ended items, I chose to use closed-response items. One limitation of this study is what individual students chose to do with the Quizlet tools and schema development strategies. Some students were engaged and very motivated and used all of the available online tools Quizlet had to offer, and others chose to only use the electronic flashcard option. Some students used all of the schema development strategies and others did not. In a future study, I would monitor this more closely. There were no budgetary limitations; the only thing that was purchased for this study was the Quizlet teachers' edition.

My study was most affected by timing, mortality rate, and student course expectations. The approval process took so long, it pushed my study to the end of the school year, after standardized testing. The iCivics course is an exploratory class, i.e., an elective, and therefore, students reported in informal interviews that they were not worried about their grade in this class because it was not a core class. Lastly, this action research study is not generalizable. However, in the future, it could be replicated and improved upon within a more appropriate time frame and through out my district in all six iCivics class, which would produce a larger sample size.

Organization of the Dissertation

This study utilizes action research to study the impact schema development strategies and the effective use of Quizlet on student summative assessment as a response to the observed pattern of increased achievement on formative assessments but not on summative assessments after the implementation of one-to-one computing. Chapter 2, the literature review, includes a review of one-to-one computing, learning and memory, flashcards and memory, cognitive learning theory, schema theory, constructivism and constructivist e-learning, vocabulary and learning, and the SAMR model. Chapter 2 therefore synthesizes the relevant literature in the main areas of research that inform the study. This chapter describes in more detail the theoretical framework, a summary of the methodological approach used, and the specific methods used in the study.

My district purchased the Apple iPads with an underlying expectation that with integration of technology, achievement would increase. Chapters 3–5 include a detailed description of the action research study, the methodology, research findings, a summary of the study, and a reflection for future action, followed by an appendix with pertinent charts that represent statistical data. Chapter 3 provides details about the study and how it was conducted in order for it to be replicated. It discusses the overall design and rationale for my selected method, which is a convergent mixed-method action research study consisting of qualitative and quantitative data being collected at the same time and being given equal emphasis. This chapter gives a thorough description of the context in which the study takes place and fully describes the participants involved in the study, along with the description of my role as researcher. Most importantly, it talks about the data collection tools used and rationale for each one, the data analysis and how I will reflect

on the data with my students and school district, and ethical considerations, along with the validity, reliability, and trustworthiness of the study. Lastly, I provide a brief explanation of how I developed an action plan to perpetuate the cycle of this action research study. Chapter 4 is an in-depth discussion of the findings and the interpretation of the explored problem of practice for the use of future action. Chapter 5 initially discusses confirming and disconfirming evidence of the qualitative and quantitative data. It then discusses how the findings are connected to the supporting literature and the theoretical perspectives. There is a discussion of the limitations of this study, and I reflect on the weaknesses and shortcomings of my research efforts. Finally, I share my reflections about personal lessons learned and the implications for future practice research.

Definition of Terms

Action research: any systematic inquiry that is conducted by teachers, administrators, counselors, or others with a vested interest in the teaching and learning process or environment for the purpose of gathering information about how their particular schools operate, how they teach, and how their students learn (Mills, 2011, in Mertler, 2014, p. 4).

Schoology: an online communication tool much like a social media site that provides students and parents with information about the students' agenda for each day. It is also equipped to allow teachers to upload tests and quizzes so students may take them on their iPads and then the grade is recorded in a grade book. From this grade book, statistical

data can be gathered with tools that make graphs of overall classroom performance Schoology, 2016).

SurveyMonkey: an online survey builder accessible to people invited to answer the survey via e-mail contact.

Quizlet: an online flashcard application that emulates a paper flashcard and has games available to practice the information typed on the card (Quizlet, 2014).

Chapter 2: Literature Review

Introduction

A literature review critically analyzes whether previous authors have accurately reported their findings, and whether present conclusions in the field of study are supported by data (APA, 2013). A rigorous literature review provides a solid foundation for conducting meaningful, relevant action research. A comprehensive literature review summarizes the current studies with similar themes to the inherent action research study. Conducting a thorough literature review also allows the researcher to look for themes that contradict the assumptions purported in the study. Subsequent studies can then further expand and develop the new knowledge pertaining to the problem of practice and its suggested solutions. This review is important to understanding the breadth of the problem of practice discussed in this action research study but also to raise questions beyond what has been discussed in the literature in order to further current studies and findings (Herr, 2006).

Purpose of the Review

The focus of this action research study is to examine how students use create their own knowledge using schema development strategies and the effective use of Quizlet to impact student achievement specifically with essential vocabulary concepts. To fully grasp the focus of this study, the review of literature begins with an examination of the

historical context of learning, always implying the learning of essential vocabulary. Following the examination of the historical context of the relevant literature, a synthesis of the theoretical framework will be provided. That theoretical framework is grounded in the philosophy of schematic theory and constructivist learning principles (Beers, 2003; Rumelhart & Norman, 1976). Lastly I include the SAMR framework that I discuss in Chapter 5 as part of my action plan (Puenterdura, 2012, 2014)

Historical Background

The historical context and theoretical framework literature provide ways to examine mid-level social studies students' use of schema development integrated into the flashcard-making application Quizlet. The review of this literature narrowed my focus, which led to the implementation of the current action research study.

Learning and Memory

To explore the nature of the relationship between students' academic performance on formative and summative tests and the development of vocabulary schemata, we first have to consider theoretical information about learning and memory. I interpret "learning" as the acquisition of knowledge, and "memory" as the process of recalling what has been learned. Alan Baddeley (2002), in his book *Human Memory*, described human memory as a system for storing and retrieving information acquired through our senses, for example, our eyes. Visual memory is used in the making of flashcards, whether written or typed, and is utilized for the storage of information in long-term memory that is needed to be able to learn. Visual memory and learning are further linked in a study by University of Stavanger assistant professor, Anne Mangen, and

neurophysiologist Jean-Luc Velay (Mangen & Velay, 2010). Mangen posed a question, asking if something is lost when switching from pencil and paper to keyboard and computer. The answer included information from Velay's research, which substantiated her view that the process of writing involves the senses visually and tactically, and our brain receives feedback that affects memory storage. Mangen stated that writing by hand strengthens the learning process, which is influenced by the hand taking longer to write than to type on a keyboard, and the switch may impair the learning process (The University of Stavanger, 2011).

Flashcards and Memory

In my experience of teaching over the last 23 years, the flashcard has evolved. Today, I have observed that teachers at my school use flashcards as a type of note taking. A flashcard is not just a word on one side of a card and a definition on the other, as it was in the 19th century; my cohorts require more. In my district, a flashcard is an identification of important concepts with the meaning, pertinence, and an example. At my school and in my classroom, students are encouraged to put this information into their own words and relate it to real life experiences so it does not just become a regurgitation of facts. I specifically use flashcards in this way to incorporate the 21st-century skills of a self-directed learner. Flashcards give students an opportunity to use self practice to later be able to answer an application-type question, so when asked a higher-order thinking question about the information, they can answer correctly by recalling it from long-term memory. According to Mangen and Velay (2010), hand writing flashcards and other types of notes is better for long-term retention of information and for harder-to-understand concepts.

According to a poll of 175 language teachers and students (Harmer, 2002; Thornbury, 2002), there are many benefits to studying using flashcards. One benefit is that making flashcards engages long-term memory to actively recall information stored. Also, as students become proficient with the information on the flashcard, they are able to gauge their progress by continuing to study only the information they cannot recall. Gauging progress is a metacognitive process that ingrains memories through the act of self-reflection. Flashcards also allow for a self-directed personalized study experience. The most beneficial use of flashcards is they allow students to space learning over time, which is called distributive practice, instead of attempting to learn all of the information in one study session. These benefits can be realized with typed flashcards using a smartphone application (Thornbury, 2002; Harmer, 2007).

Recent studies involving flashcard applications like Quizlet mainly focus on the acquisition of vocabulary for second-language learners, vocabulary to increase self-efficacy in required writing prompts, and vocabulary of advanced subject content, for example, applied biology. In a study by Daniel Jackson (2015), Quizlet was used to learn English in an Arabic-speaking classroom. Quizlet was said to be an "extrinsically motivating" factor in vocabulary learning and claims that "paper notecards cannot compete with Quizlet's digital ones that offer immediate feedback and audio reinforcement" (Jackson, 2105, p. 10). A qualitative study by Chin-Wen Chien (2015) agreed with those findings, stating, " participants held positive attitudes toward learning and improving their vocabulary abilities via online flashcards and their related activities" (p. 120). A quasi-experimental design study by Kelly Grillo (2011) examined the effects of a digital flashcard intervention versus a paper flashcard intervention in biology for

students with learning disabilities and found a statistically significant increase on both vocabulary assessments as well as the final course grade. This study focused on the impact of a vocabulary flashcard application similar to Quizlet called Study Stack™. In Hoang Dang's article, "Web-based Vocabulary Learning with Quizlet," (2015) he provided and overview of Quizlet and its benefits. The article compares Quizlet's web-based flashcard program to Nakata's (2011) criteria for evaluating a web-based flashcard. He cited studies that purported the benefits of web-based flashcard programs may even outweigh those of paper-based ones because they increase student vocabulary size, track student learning over time, motivate student learning, and allow the student to study anytime, anywhere.

According to cognitivist theory, the engagement in the aforementioned studies is the rehearsal needed to store information in long-term memory. A schema is formed when the student uses the flashcard repeatedly or chunks related cards together to extend or replace existing schemata with newer information. When students continue to only study the information they do not know, the existing schema is altered to accommodate new information. While studying the flashcards, students store the information in long-term memory by these deeper levels of reflective processing (Driscol, 2005; Driscoll & Van Barneveld, 2015).

Cognitive Learning Theory

As students learn, they actively create cognitive structures, integrations of the events into the memory storage system that is then turned into organized structures called schemata. Schemata organize and process all information students receive from their

environment. Schemata regulate attention, organize searches of the students' environment, and fill in missing information during information processing to make sense of the world. New information is encoded, or prepared, for storage in memory through existing frameworks of schemata. This new information activates current schemata, changing them to fit students' existing schemata. If a students' schematic framework is insufficient because she is not able to make learning meaningful and store the information into long-term memory, learning problems arise (Grider, 1993).

John Piaget's emphasis was on cognitive growth and development. He believed that students interact with their environment and are constantly collecting and organizing information as they develop. As students develop, they grow cognitively. They form new mental structures, or schemata. Piaget believed this happens through the processes of assimilation and accommodation. Through assimilation, students integrate new information into existing components or schema, and they accommodate for change or reorganize an existing structure. Jerome S. Bruner (1966) supported Piaget's findings and further described the levels of process involved in cognitive growth. He referred to the levels of cognitive growth as a symbolic representation, which became a key component of cognitive psychology. He later formulated and instructional theory for effective teaching based on symbolic representation (Bruner, 1966; Grider, 1993).

Schema Theory

Schema theory is a theory about how knowledge is represented and how that representation is used to create new knowledge. According to schema theory, knowledge is packaged into units called schemata and, in addition to the knowledge itself or original schema, this packet of schemata is accompanied by information about how this

knowledge is to be used. According to Rumelhart and Norman (1976), schemata are structures for representing concepts stored in memory. He compared this structure to a series of informal, private, unarticulated theories constructed to interpret events, objects, and situations. Rumelhart and Norman (1976) stated that schemata are activated by subschemata that are either conceptually driven or data driven. Conceptually driven processing is when a schema is activated and then activates a subschema to process the new information. Rumelhart and Norman explained conceptually driven activation as going from whole to part, and data-driven activation goes from part to whole. Whenever an existing schema is activated, it is interpreted and then later processed to confirm or disconfirm information in reconstructing a schema. There are three different methods of learning that are possible in a schema-based system: *accretion,* which consists of comprehension of facts; *tuning*, which takes please fax for existing schemata and makes changes by elaboration or refinement; and *restructuring*, which is the creation of new schemata and the development of new concepts.

Constructivism

The constructivist theory assumes the learner constructs knowledge into meaning. Counter theories utilize patterns of the activations linking part to parcel, or divided parts, to understanding stored information, identify learners' goals, and arrange present effective contingencies, where knowledge is transferred to learn about inputs and stored. According to Driscoll (2005), the construction of knowledge does not correspond to external reality but is more of a social negotiation that tests the learner to understand. Constructivist models of memory report that memory is constantly changing shape and has unlimited potential of knowledge construction, relies on stored terms of concepts, and

makes connections by association. Also, that memory is a meaningful relationship that reveals how any two things can be linked. Additionally, memory is a compilation of knowledge that allows for new rules to be established when problems are presented that need to be addressed (Driscoll, 2005). Constructivist learning goals identify learning as relevant context in meaningful activities with continuous critical thinking and collaboration skills amongst learners. The constructivist teacher would guide students to a zone of proximal development, which provides enough guidance to facilitate task expectations by scaffolding to maximize learners' abilities and capabilities.

In this student-centered model, the learner is responsible for problem solving and achieving desired improvements (Driscoll, 2005). Conditions for learning in constructivism include relevant environments for problem solving: Collaboration and social negotiations are an integral part allowing for sharing multiple points of views. These learning environments should include multiple sensory modes such as visual, auditory, and tactile representations. It should be one that nurtures self-awareness of new knowledge that is constructed, where metacognition is the center of reasoning and others' perspectives and positions are understood. Constructivist learning environments support active, successful learners who acquire knowledge from examples and by doing, enabling them to achieve deep levels of understanding rather than rote learning regurgitation of information.

Constructivist e-Learning

Maggie Beers (2003) stated that many individuals have contributed to the evolution of constructivism: Socratic method (Socrates), Piaget's equilibration theory,

Vygotsky's zone of proximal development, Dewey's learn by doing ideology, Bruner's constructivist theory, and Papert's constructionist theory. From these, she developed seven constructivist guiding principles to use to plan and implement e-learning modules. The guiding principles are construction of knowledge, process not product, multiple perspectives, situated cognition, reflective cognition, cognitive apprenticeship, and process-based evaluation. During the first step, construction of knowledge, instruction focuses on developing the skills of the learner by providing the context and assistance for learning in the form of mentoring, collaboration, or personal reflection to make sense of the environment as it is encountered. The next step, process not product, is where the instructor asks the student to become the expert and construct knowledge based on that expert's prescribed tasks. The third step, multiple perspectives, involves a collaborative learning environment in which students socially negotiate and construct multiple perspectives on an issue and then evaluate those perspectives. Students identify the strengths and weaknesses of multiple perspectives and adopt the one most useful, meaningful, or relevant to them in that particular context. The next step, situated cognition, refers to the experience in which an idea is embedded and is critical to the students' understanding of and inability to use that idea. This experience or situation should be in authentic, real life activities. The fifth step is reflexive cognition, which focuses on metacognitive skills are when students are thinking about their own thinking. This should involve problem solving of real world problems. The next step is cognitive apprenticeship, where the teacher models the process and coaches the students toward expert performance. Scaffolding, in the form of visual support materials, enables the learner to perform authentic tasks performed by the experts they have been asked to

become. The last step, process based evaluation, examines the thinking process "instrumentality" and "metacognitively." Instrumentality refers to students' development of their own unique perspective. Metacognitively refers to the student thinking about their judgments in the process through which they constructed their perspectives (Beers, 2003).

In constructivist e-learning, learning is the active process of constructing knowledge during technology integration. The lesson plan phases consists of pre-assessment, introducing new concepts, making connections, reflection, and post assessment. Technology integration ranges are described as a range from low-tech delivery to mid-tech delivery to high-tech delivery (Beers, 2003).

Vocabulary and Learning

Vocabulary is the foundation of reading comprehension. Reading comprehension depends on the meaning that readers can give to vocabulary words. The more vocabulary words students know, the better they are able to comprehend what they read. A student's vocabulary opens a wider range of reading materials and improves the student's ability to communicate. Baumann (1991), Stanovich, Nathan, and Vala-Rossi (1986), and Becker (1997) stated that vocabulary deficiencies are a primary cause of academic failure. They also believe that an explicit instruction of vocabulary words improved academic success and enabled students to better discern the meanings of novel words (Marzano & Pickering, 2005). Anderson and Nagy (1989) reported on how students' knowledge of word meanings is acquired and used in reading comprehension. They distinguished between the definition of a word and the meaning of the word. Anderson and Nagy

(1989) stated that words have certain nuances contained within the context in which they are written, giving people a *sense* of the word, or a *reference* point—a *connotation* or a *denotation*. They discuss the different theories of vocabulary development, including parsimonious, general account of semantics, and standard theory. Anderson and Nagy (1989) did not endorse the widespread practice of pre-teaching unfamiliar vocabulary but felt that learning novel words is part of comprehending the gist of a story.

SAMR

The SAMR model was created by Dr. Ruben Puentedura (2012) to help teachers acquire technology proficiency with the hope of promoting 21st-century skills. It was designed to help teachers move beyond lower levels of technological literacy so they are able to integrate technology into their lesson plans in creative and innovative ways. The acronym SAMR stands for "substitution, augmentation, modification and redefinition." *Substitution* is when the technology is used to substitute traditional ways of learning and grabs the students' attention so student engagement is increased. *Augmentation* is when the technology uses applications that engage students with different learning styles, for example being able to explore videos. *Modification* is the phase in which the student takes the lead in their learning and creates a product with technology, for example creating their own video instead of watching someone else's. *Redefinition* is the highest level of technology, according to Puentedura (2012), where technology allows for students to create new activities or assignments, virtual fieldtrips, websites, or Internet products to share beyond the classroom. With the prevalence of one-to-one computing,

the SAMR model is a guideline for not only teachers but also for students to effectively integrate technology and help them become creators of their own knowledge.

Conclusion

The literature review examined the historical framework of learning vocabulary concepts scaffolded by schema development strategies with the effective use of the digital application Quizlet, a flashcard-making formative tool. A review of sources guided the framework that influenced my action research study. The literature revealed the interconnectedness of cognitivism and schema theory, and constructivism and the integration of the technology, and how these ideologies align with each other. The literature review provided a solid foundation for conducting meaningful, relevant action research. Relevant action research creates a bridge between theory and practice: Learning vocabulary is the foundation of reading comprehension and schema development, and its learning strategies are effective methods of instruction. A constructivist learning environment integrating technology was supported by the historical and philosophical information in the literature review. The research provided in the literature review suggests that cognitive schema theory development strategies would likely have a positive impact on student formative and summative assessments. The studies reviewed integrating Quizlet study modes and games as a formative tool for vocabulary development also infer a positive influence on student achievement. These studies grounded the action research study, and because the schemata strategies, the Quizlet study modes and surveys were used concurrently, a mixed-methods action research plan was used. The following chapter, Methodology, provides information about exploring the roll of schema development strategies and the effective use of Quizlet and describes

student perception concerning the impact of technology integration of Quizlet on their academic achievement. Chapter 3 also explains the rational for the convergent mixed-methods approach, describes the context and participants in the study, discusses validity, reliability, and transferability, and ends with implications for the action plan which includes SAMR researched in the literature review.

Chapter 3: Methodology

Introduction

The purpose of this action research study was to examine how students construct their knowledge using schema development strategies for learning essential vocabulary pertaining to a unit on propaganda. Also, this study examined the way mid-level social studies students use the study modes and games of the flashcard-making application Quizlet to assist in the transfer of knowledge into long-term memory with rote memorization. It also attempted to discover how students effectively used the schema development strategies and how the full use of Quizlet impacted student achievement and affected student perceptions of their academic achievement. The following research questions were explored during the study:

1. How does using schema development strategies impact student achievement?
2. How does the effective use of Quizlet as a formative assessment tool impact student achievement?
3. How do students perceive the use of Quizlet on their academic success?

This chapter will describe (a) the rationale for the selected methodology, summarizing the key tenets of action research; (b) context and participants, including the context within which the study took place and a full description of the participants, their role, and my role as a teacher-researcher; (c) methods of data collection and analysis and how

these methods ensure validity and transferability; and (d) pertinent ethical considerations. The chapter ends with a brief summary of how this action research study meets the key tenets of action research and how I develop an action plan following the analysis of my data.

This study used a convergent mixed-methods design, which took 10 class periods to complete. In this chapter, I explain the research procedures along with a detailed explanation of the intervention of schema development using Quizlet as the formative tool.

Rationale for the Selected Method

Action research is a systematic inquiry done by teachers for teachers that is cyclical and iterative. An integral part of action research is teacher reflection, which serves to improve educational practice and to provide professional growth (Mertler, 2014, p. 32). In action research, "there are three basic mixed-methods designs—explanatory, exploratory, and triangulation designs"(Mertler, 2014, p. 104). All three methods collect both types of data, quantitative and qualitative. The difference in each is when the data is collected. In the explanatory mixed-methods design, quantitative data is collected first, followed by the collection of qualitative data, to help support, explain, and/or elaborate on the quantitative results. The opposite is true for exploratory mixed-methods design. Qualitative data is first collected in order to explore the topic of interest, and then quantitative data is collected to explain relationships that were discovered in the qualitative data. Triangulation mixed-methods design is when both quantitative and qualitative data are collected at about the same time and are given equal emphasis

(Creswell, 2005; Mertler, 2014). This design is also called concurrent or convergent mixed-method design. Mixed-methods design incorporates elements of both qualitative and quantitative approaches, integrating the two forms of data. A mixed-methods research approach is being used in this study because the combination of the qualitative and quantitative approaches provides a more complete understanding of the research problem than either approach does independently. A convergent mixed-method design was chosen so that both forms of data, quantitative and qualitative, could be collected roughly at the same time. These two forms of data will be merged in order to provide a comprehensive analysis of the research problem. When interpreting the overall results, contradictions or incongruent findings could then be explained and further probed (Creswell, 2016).

Quantitative data were collected from the pretest and posttest, and these data have been compared to identify if the mean or average has change after the implementation of the intervention. Two other student documents—a pen-and-paper formative assessment and a pen-and-paper summative assessment—also produced quantitative data for analysis. The pretest scores will also be compared to the pen-and-paper summative assessment. Students' flashcards created in the digital vocabulary application Quizlet, which provided evidence of whether or not students used the schema development strategies, produced quantitative data. A pre and post student perception survey about their perspectives pertaining to the use of Quizlet produced qualitative data to inform the teacher-researcher's future lesson planning. A synthesis of the data provided a comprehensive analysis of the research problem by integrating information into the interpretation of the overall results. The pretest, and posttest, were created, taken by

students, and analyzed using the digital learning management system, Schoology. Schoology allows teachers to create testing and quizzes to assess students' baseline knowledge via pretest and their grasp of materials via posttest. Schoology has the ability to propagate students' scores on these tests and aggregate the data using a normal distribution graph that includes the number of grades, maximum points, highest great, lowest grade, average grade, standard deviation, median, and mode. Schoology also provide statistics that shows how students perform on each question.

Context and Participants

This action research study took place at a rural middle school in the southeastern United States that serves approximately 1,200 students per year. The participants were 48 seventh-grade students—38 boys and 10 girls—in a semester-long middle school government course. This was a convenience sample because the participants were students in an elective civics exploratory class of their choosing. The class consisted of culturally diverse students who ranged in age from 12 to 13, including one ESOL student and three special education students—one of whom was emotionally disabled. Six participants were receiving RTI (Response to Intervention) support in ELA (English language arts). The student-participants' abilities ranged from a basic level of proficiency to an above average proficiency, with the majority of students above a basic level of proficiency in social studies based on previous SCPASS scores. However, there were 12 students with scores between 340 and 509 who did not meet expectations in ELA on SCREADY. There were three students new to the school that did not have test scores.

Participation in the study was voluntary, with no consequences for non-participation and no privileges or rewards for participation. All 48 students enrolled in the course chose to participate. There are two seventh-grade classes involved in the study. The students' role in the study was to construct their own schema pertaining to propaganda vocabulary concepts, engage in and complete formative learning strategies, complete a summative assessment, participate by taking a pretest and posttest assessing their knowledge of the propaganda vocabulary concepts, participate in a pre and post survey about their perceptions of using Quizlet, and provide their perspectives on their use of Quizlet.

My role as the teacher-researcher was to facilitate all parts of the action research. I identified the area of focus with the help of my collaborative team at school and the team of iCivics teachers in the district. I decided to use the instructional design and assessment lesson plan I created about the theme of "yellow journalism"—or propaganda—most recently coined "fake news." To model schema development strategies, I showed the students several movie examples, provided political cartoons and informational texts, so they could use these examples to extend their existing knowledge of propaganda and tune and restructure their current schema. The most challenging part of my role as the teacher-researcher was analyzing and interpreting the data. The most essential part of action research is the role of a reflective teacher when developing the plan of action. As a reflective teacher, I will develop new lessons "with thoughtful consideration of educational theory, existing research, and practical experience, along with the analysis of the lesson's effect on student learning" (Mertler, 2014, p. 13).

Research Methods

Implementation of Schema Development Strategies

In this action research study, I used Maggie Beers' (2003) best practices in constructivist e-learning. These best practices are based on the seven principles of constructivism:

1. Construction of knowledge
2. Process not product
3. Multiple perspectives
4. Situated cognition
5. Reflexive cognition
6. Cognitive apprenticeship
7. Process-based evaluation

The first guiding principle is the construction and reconstruction of knowledge using learning activities that activate prior knowledge and relate them to new knowledge. Activating prior knowledge aligns with Schema theory's accretion mode of learning. Students had access to resources for problem solving such as the Internet on their personal iPads. They were able to affect the environment in some way by manipulating something, for example, the Quizlet application on their iPad or personal cell phone. They created a product using hypermedia and multimedia to provide evidence of using the schema development strategies to construct their knowledge, for example creating electronic flashcards and a live game for the class to play.

The second guiding principle establishes that *process* is more important than *product.* Students accessed and translated information into new knowledge through

developing new interpretations and perspectives pertaining to the seven major types of propaganda. Students then evaluated the quality and quantity of their assembled content, and peer feedback and revisions provide opportunity to reorganize and restructure information into more meaningful content. Step 2 aligns with schema development strategies associated with tuning.

The third principle provides for multiple perspectives and is also aligned with tuning. Students were provided opportunities for collaboration where they exchanged perspectives and then reconstructed their own perspectives and reconcile dissonance views. This principle aligns with restructuring schema after exposure to multiple perspectives and social negotiation.

The next principle is called situated cognition, which aligns with accretion and tuning. This principle supports the ideology of constructivist learning environments, which support question/issue-based, case-based, project based, or problem-based learning that is interesting, relevant, and engaging. In the lesson, students are always striving to develop their civic voice. In this specific lesson pertaining to propaganda, students took on the role of "future voter" and became an expert in identifying the types of propaganda so that they could discern true informational facts from persuasive propaganda and make educated informed decisions on how to cast their vote.

The fifth principle is called reflexive cognition because students were encouraged to become self-regulatory—for example, choosing which Quizlet games or functions to use and how often they use them. The students became self-regulated learners by

assuming responsibility for resetting their own goals, determining their own strategies, and monitoring their own learning.

The next principle, cognitive apprenticeship, stresses that the students and teacher receive appropriate training. I had a small group of students who need a tutorial to teach them how to use Quizlet's study modes and games. In this step, I modeled the schema development strategies and coached the same small group to help them improve their personal performance with summarizing information in their own words, searching safe sites for pictorial examples, and explain to a peer what they had learned. This coaching consisted of scaffolding their temporary frameworks or existing schema to support learning or tuning their schema so the students could restructure their schemata and performance beyond their current capability.

The seventh and final principle is process-based evaluation, where assessment of skills was using the skill. In this case, it was the skill of being persuasive. This assessment of skills involves using the skills for applying what the students have learned to a real life complexity of problems (Beers, 2003). After working in their groups, the students judged who had the best examples and chose an expert from their group for each type of propaganda. They had to share their new examples of the vocabulary concepts and be prepared to defend their choice and explain its relevance. The goal of this constructivist lesson was to apply what they learned to real life, for example, to be able to find reliable sources to support or not support what was being said in the news.

I chose these guiding principles because they aligned with the three processes of schema development and my district's initiatives of obtaining 21st-century skills, as well

as because this action research study is only a small component of the actual lesson taught. It was not about front-loading vocabulary or the intentional teaching of vocabulary that teachers have to do, by law, for special education and ESOL students according to their IEPs.

I chose the specific strategies based on my twenty-three years of teaching experience and the following information surrounding learning vocabulary concepts by activating existing schema through tuning, tuning that schemata by summarizing information in the students' own words, pictorial examples, using the vocabulary concepts in written words to explain what they have learned and then practicing the use of the words via Quizlet.

A lack of vocabulary knowledge can be an important reason for failure to solve many problems. Students were asked to read informational test in the lesson (Appendix X) and Segal (2014) states that "exercises such selecting vocabulary words, and making inferences from texts" (p. 307) improved reading. Segal reported that students working in collaborative groups during and working in pairs is valued in promoting vocabulary acquisition. Strategies devised for helping students to distinguish between definitions and meanings of words starts with teachers drawing on the general vocabulary background to then construct a visual display to develop and express vocabulary concepts. Some students low achieving SPED, and ESOL students are unable to consider word meanings in abstract terms. (Segal, 2014).

Flashcards can associate objects providing a visual context to the card and add context by writing words in complete sentences (reference) explaining what they have

learned. This type of elaboration involves making associations between the new vocabulary concept and the concepts already in the learner's memory creates context for students. Students constructing a meaningful association will strengthen the existing schemata. When a teacher asks students to make new word and concept associations this can be used for diagnosing what students already know and what they need to learn. Most learners are capable of associating new information to meaningful visual memory images, which makes learning more efficient. Production practice or using the word in sentences while explaining what a student has learned is extremely important. Structured review or going back over vocabulary at different intervals, *as with Quizlet,* is "scientifically based on memory principles which highlight the importance of primacy, recency, duration, spacing, pacing, and linking" (Oxford, 1990, p. 24).

Implementation of Quizlet Study Modes and Games

Quizlet is an internationally available website used to teach vocabulary of all subjects at all levels of education. The website was created in 2005 and hosts and shares user-created virtual flashcard lists. Quizlet's teacher information toolset allows for the tracking of student work, providing information about individual student usage.

Quizlet has seven functions/games that students can use to reinforce classroom vocabulary.

1. The *Flash Card* function or study mode is similar to paper flashcards. Students are shown a "card" for each concept. They can then flip over the card or use their arrow keys and see the definition, examples, and pictures for that term. The

student has the option for the face of the card to be a picture, writing, or both if it is desired.

2. *Gravity* study mode is one of the games available, where definitions scroll vertically down the screen in the shape of asteroids. The student must type the term that goes with the definition, example, and picture before it reaches the bottom of the screen. The student can pick the level of difficulty and game type.
3. In the *Learn* study mode, students are shown a vocabulary concept word or the definition, example, and picture side on the card and must type the opposite sides' information that goes with what is shown. After entering their answer, students see if their answer was correct or not, and can choose to override the automatic grading and count their answer as right if needed.
4. The *Long-Term Learning* study mode is interactive: Students are given a recommended study set based on whether or not they answer study set questions correctly. The set consists only of the vocabulary concepts that they did not know after the initial study phase. Repeating these terms and answering them correctly increases learning progress over time because this mode uses spaced repetition concepts to focus on longer-term retention and subject mastery versus shorter-term memorization.
5. In the *Speller* mode, the term is read out loud, and students must type in the term with the correct spelling. If they spell the word wrong in other study modes, the answer is marked incorrect.
6. The *Match* study mode presents students' vocabulary concept words scattered around on a grid. Students drag the vocabulary term on top of their associated

definitions, example, or picture to remove them from the grid and try to clear the grid in the fastest time possible. Micro-match is the same matching game used on mobile devices and devices with small screens.

7. *Live* is the study mode where the teacher or student can create a game from a set of vocabulary concepts. Usually the students in the class are broken up into teams, and they choose which side of the flashcard to use. Each team will have to choose the correct vocabulary concept/definition, example, or picture to win. Whoever gets the most points for a team wins. If the teacher decides to shuffle the teams, the class is randomly put into new teams. This game works by choosing a set of flashcards created by the students and putting them into a format that works for the game.

In this study, students used Quizlet during class to create their own individual vocabulary flashcard sets pertaining to a unit on propaganda. The students eventually had to identify the meaning of the following words: bias(ed), endorse(ment), symbol(ism), testimonial(s), bandwagon, name-calling, card stacking, plain folks, and transfer. As the teacher-researcher, I was able to access and record details on the number of times each of the seven study modes or games of the Quizlet application was used or played. I was also able to see what time of day students accessed them and whether or not a student mastered a majority (80%) of the vocabulary concepts. I was also able to see if the students used their iPad or a mobile device to access the program and, most importantly, which specific vocabulary words students were struggling with.

All participants in the study had been taught how to access Quizlet on their iPads and had an active account. Students were not offered extra credit for using Quizlet and

could use any other strategy of choice to learn the vocabulary. While modeling schema development strategies, students were encouraged to elaborate on a vocabulary concept's basic definition by summarizing the researched definition in their own words, adding movie, political, and commercial examples.

Each day of the study, students were asked to use one of the seven study modes or games to interact with the vocabulary concepts' meaning and examples students associated with them. Before the summative assessment, student groups chose which group members' flashcards had the most accurate meaning, examples, and explanation of the examples to use for the Quizlet Live game. Students then access the Live tab within that student's flashcard set and then selects create game. The students are then given a code that they have to enter to access the game and have to go to www.quizlet.live to play the game. This game, along with their individual sets, can be shared with other groups in the class and other classes in the school, district, and the public.

Research Question 1: Data Collection Methods

Overview of methods. When I began this action research study, my original research question was about the impact of Quizlet on middle school social studies students' achievement. However, after analyzing the actual lesson that I would be using, I realized what I was actually asking the students to do was to build new schemata around their pre-existing knowledge of propaganda, while simultaneously using the study modes and games of the digital vocabulary application called Quizlet. I was also interested in student perceptions surrounding the use of Quizlet and how it impacted their academic success. Because I was collecting quantitative data and qualitative data at the same time, I

implemented a convergent mixed-methods design that allowed me, as the teacher-researcher, "to equally combine the strengths of each form of data" (Mertler, 2014, p. 105). Using both data-collection methods allowed me to explore how students constructed their knowledge using schema development strategies and the efficient use of Quizlet as a formative tool impacted students' summative assessments and their perceptions pertaining to this impact.

To analyze the data pertaining to schema development strategies I addressed the question: How does using schema development strategies impact student achievement? Schema development is a biological brain activity that I could not actually view to measure although there are current studies that are mapping word meanings in the brain with the assistance of MRI technology https://www.nature.com/articles/nature17637. In this action research study I used Rumelhart's (1976)modes of learning accretion, tuning, and restructuring as my guide for choosing which strategies to use. Learning through accretion is the learning of facts, for example dates, names of presidents, and word meanings. Accretion involves eliciting existing facts and information already in memory. Students were asked to record on their flashcard what they thought of when they heard the word "propaganda" to elicit their existing knowledge. Learning through tuning involves this existing information, or scheme to be modified. Students enjoyed a guest speaker who talked about the vocabulary concepts "symbol", "bias", and "endorse" and how they related to propaganda during political elections. This allowed them to modify or add to what they already knew or tune the existing schema. Students were asked to redefine these vocabulary concepts in their own words therefore modifying them and record them on their flashcards. According to Rumelhart (1976) "tuning is a substantially

more significant kind of learning" (p. 4) so, I modeled researching on the internet through a safe site a movie that depicted propaganda or one of the seven major types of propaganda and asked them to then find one of their own and record it on their flashcard. Some students struggled with this so I scaffold their learning with researching political slogans and signs during the last presidential election and then ask them to find a different one from mine and add it to their flashcards. Restructuring is the most difficult process and it occurs when new interpretations of an existing schema are imposed and this interpretation or explanation allows for the acquisition of new knowledge. Students were later in the lesson asked to explain the examples they put on their flashcards.

I ask students to do these specific strategies because they align with schema theory and because IEP's written for special education students and 504's written for ESOL students in my class required these for the introduction of new vocabulary. This vocabulary was given to the special education teachers and ESOL teacher in advance.

I used a table like Table 3.1 to code the frequency of evidence of schema development; the complete data is in Appendix K.

Table 3.1

Sample Table Evidence of Schema Development

Student	Existing Schema	Definition their words	Movie Example	Pictorial Example	Explained Examples
1.					
2.					
3.					
4.					

For my second research question— How can the effective use of Quizlet as a formative assessment tool impact student achievement? —I felt it was important to gather some baseline information. To gain this baseline information, I used a matching format vocabulary quiz created and used by all of the iCivics teachers in the district as the pretest (Appendix A). The students took this before we started the learning unit. At the end of the study, students were given the same test as the posttest to see if the mean or average score had changed. Data was also collected from a formative assessment (Appendix G) and a summative assessment (Appendix I). The summative assessment is an application critical thinking summative assessment given to see if students understood the information or just memorized the basic copied-and-pasted definitions.

Pretest/posttest. A pretest is a preliminary test administered to determine a student's baseline knowledge or preparedness for a learning unit. Pretesting the students also aligns with Beers' (2003) lesson plan phase pre-assessment. In this study, students were told that this test did not count against their grade; it was just an evaluation to see what they already knew about propaganda. The pretest was taken through Schoology, my school's management system, a program similar to Blackboard on the college level. Each student used a privacy screen. This pretest (see Appendix A) consisted of 10 matching test items addressing the prior knowledge of the seven major types of propaganda along with the associated vocabulary words "bias," "symbol," and "endorsement." The 10 words would be matched to a definition provided by the iCivics curriculum. I chose the matching format because this format relies on recognizing the information and being able to activate prior knowledge or existing schemata. The posttest was exactly the same as

the pretest. It was taken through Schoology, and each student used a privacy screen. I used the privacy screens to assure the students were not relying on a neighbor's answers so I could gather valid data.

Table 3.2

Sample Table of Quizlet Usage

Student	Learn	Flashcards	Write	Spell	Test	Match	Gravity
1							
2							
3							
4							

Quizlet participation. The digital vocabulary application, Quizlet, was chosen because students at my middle school were already using this application in all of their core classes. I also used this application because teachers and students reported increased scores after using the digital application. My school bought a teacher upgrade package of the application for me to use with my classes. This upgrade allowed me to collect data on the study modes and games students play most often, when they are playing them, and which vocabulary concepts they did not understand. I used a table like Table 3.2 to code the frequency of Quizlet study modes and game; the complete data is in Appendix J.

Formative quiz. Students completed the formative quiz after they completed their individual set of flashcards and I had modeled the schema development strategies

first four steps of constructivist e-learning. The quiz was taken by pen-and-paper method, and each student used a privacy screen. The formative quiz (Appendix G) addressed the learning objectives of identifying bias, propaganda, and symbolism in media, along with differentiating among forms of persuasive media. There were four matching questions similar to the pretest. There were three short answer questions pertaining to the students' symbols of choice, and three questions that asked them to read a message and then decide if it was biased, along with identifying which propaganda technique was used. Students were then allowed to use the corrective feedback from the formative quiz to add information to their flashcards for further understanding.

Summative assessment. A summative assessment was given to students that asked them to explain the message that was associated with a gallery of pictorial examples about propaganda. The summative assessment was taken by pen-and-paper method, and each student used a privacy screen. The learning objectives for the students were to differentiate among the forms of persuasive media and identify forms of propaganda in use in each example. There were 16 images in the gallery walk for students to examine and analyze. There were three to four questions about each pictorial example to help students think critically what was taking place in the image. There were also higher-order questions about the technique used in each image. This summative assessment lasted the entire 52-minute class for most students, with several students staying a few minutes extra after class to complete it. The summative assessment can be viewed in Appendix I.

As I monitored the assessment, many students asked me about the specific section in which they were asked to unscramble words. For all students who were struggling with

this section, I suggested that they admit their difficulty and go to the next question so they could complete the test. I omitted this section when grading the assessment. Each student used a privacy screen. Students were told that this test would count for a grade.

Research Question 2: Data Collection Methods

Pilot study. A pilot study was conducted prior to creating the survey and then pilot tested on 10 students in one of my other classes not involved in the study. The Core Questions 5–7 on the pre-survey addressed the question of efficiency of use and Questions 8 and 9 addressed the question of student perceptions pertaining to their success on summative assessments after using Quizlet. On the post survey, Core Questions 4, 6, and 7 addressed efficiency of use and 1, 9, and 10 addressed the question of student perceptions pertaining to their success on summative assessments. I administered the pre-survey prior to starting the classroom unit on propaganda using Quizlet, and analyzed it along with a post-survey to gauge students' perceptions. Student perceptions and input through these surveys will be part of the foundation to future change in lesson planning. A descriptive statistics of the pilot study is included below:

In the pilot study students were assigned pseudonyms and the list of students are as follows: Mary, Edith, Rose, Sybil, Cora, Matthew, Bates, Carson, Barrow, and Branson. The following questions were asked and responses were documented from these students during the pilot study. The questions and answers guided the construction of the surveys.

1. Do you currently have a personal Quizlet account?

   Mary: Yes, several of my friends have them as well.

2. Do you currently have the Quizlet application downloaded on your phone?

   Bates: No, I don't have enough room because of my game apps.

   Cora: Yes, because I wanted to be able to study at any time I had access to my phone.

   Barrow: No, because I don't want no educational app on my iphone.

   Matthew: Is it free?

3. Do you currently use Quizlet in another class?

   Edith: Yes, several of my teachers had us download the app in class.

4. In how many classes do you use Quizlet?

   Carson: This year I have had three teachers ask us to use it in class or home for studying.

5. How many times do you use Quizlet per week?

   Rose: I probably only use it once or twice in a week, but some weeks I may not use it at all.

6. When your teacher asks you to use Quizlet do you comply?

   Barrow: Yes, I do. I like using it but some of my friends don't like it.

   Sybil: I really don't use it unless my teacher tells us to use it in class.

   Rose: I use Quizlet instead of writing my own flashcards because it takes me too long to hand write cards.

7. Do you feel that Quizlet helps you be more successful with formative assessments?

Branson: I did do better on my last quiz after studying with Quizlet. I had not really used it before like I was told to.

8. Do you feel like Quizlet helps you be more successful on summative assessments?

   Edith: Yes, I have started using it more at home and I think it has bring my grades up.

9. Do feel that using Quizlet is easy or difficult to use?

   Carson: I think it's pretty easy.

   Mary: Some kids need help I think they need a tutor

10. Why do you think you do well on summatives after playing Quizlet Live?

    Barrow: Because it was for a grade.

    Edith: Because the teacher made the game for us.

    Bates: Because the questions were just like the questions on the test.

11. How important do you think learning vocabulary is to doing well on end of year course testing and standardized testing, like SCPASS and SCREADY?

    Sybil: It is really hard to get the answer correct if I don't understand the words.

    Branson: I skip the word I don't know and hope for the best

12. Do you feel if you could create the game that you would be successful on your tests?

    Bates: No, because I don't know what to study for.

    Mary: No because my flashcards would be wrong.

13. Is there anybody who likes to use handwritten flashcards instead of Quizlet?

    Cora: I use to before they gave us an iPad.

    Carson: My girlfriend does and she does them in all different colors

14. Which functions or games in Quizlet do you use the most?

    [All of the students were yelling out different things so I just listed them all and allowed them to choose as many as they claimed they used.]

    a. Live

    b. Learn

    c. Gravity

    d. Flashcards

    e. Match

    f. Write

    g. Spell

    h. Test

15. When learning vocabulary do you learn better if the vocabulary is presented

    [All of the students yelled out different responses but they consisted of:

    at the beginning

    at the end

    as you go along

Informal interviews. Hubbard and Power (2003) reminded teacher-researchers not to forget the value of informal interviews (Mertler, 2014). Throughout the data collection process, I found myself asking students many spontaneous questions as a part of my daily interactions with them. These informal interview questions are listed as follows and helped me to develop the student perception post-survey (Appendix D).

16. When creating your own flashcards for the propaganda lesson did you

    copy and paste your definitions

write the definitions in your own words

typed the definition from a memory

17. At what point did you download Quizlet to your iPad?

    before this unit in another class

    when instructed to do so by the teacher

    when you wanted to study at home but did not have internet availability

18. After the teacher shared with you what the summative would look like, how did you change your flashcards?

    I did not change them I just continued to study what I had.

    I added pictures and examples because that is what the summative looked like.

    I added pictures and examples but I did not understand the examples.

Student pre-survey. The student pre-survey was created and administered through an online survey generator site called Survey Monkey. The reason I chose to use this application was that it generates and provides automatic data about the user. The student pre-survey asked questions about students' current use of Quizlet, their perceptions pertaining to ease of use, and their attribution of achievement success to its use (Appendix C). The survey asked closed-ended questions, however some of the questions had answer choices that allowed students to choose more than one answer by checking a box.

Student post-survey. The student post-survey was also created and administered through the online survey generator site, Survey Monkey. This survey was a product of the informal interview questions asked spontaneously during class as data was being collected. Several questions were based on comments students made about Quizlet during

class, for example, students reported that they did well on summative tests in other core classes after playing a Quizlet Live game. Students also reported that they did not feel they did well on recent standardized tests because they did not know what some of the words meant that were used on the test.

Ethical Considerations

This action research study earned an exempt status from the Institution Review Board (IRB) because it is research conducted in an educational setting involving normal educational practices and research on the effectiveness of instructional methods and curriculum. Because of this exempt status, IRB did not require me to get consent from the parents or assent from the students; however, my school district did. So, before any data collection occurred, a letter was sent to all perspective students (Appendix L). The letter explained the details of the action research study, described the students' role, assured the parents and students of their anonymity and confidentiality of information, and stated that participation in the study was voluntary and that the student could leave the study at anytime. The letter was signed by all parties agreeing to participate in the study and returned to me to be retained for my records. I obtained this from the parents and student to be able to utilize the student documents and surveys for analysis, and upon request, a copy of the completed action research study will be provided to the parent or student (Mertler, 2014).

As the teacher-researcher, I refer to the context as "my school" and "my district" to protect the anonymity of participants. I will not be publishing individual student documents or data or reveal the identity of any students who participated in the study. All

student documents and data will be retained for a period of three years following the completion of the study and will then be destroyed. These documents are further secured with a digital password or in a locked location. Student perceptions surveys through Survey Monkey were totally anonymous, students' Quizlet accounts are password-protected and students were asked to use an identifier other than their real name, and only a student number denotes the pretest and posttest data on Schoology.

Validity, Reliability, and Trustworthiness

In order to ensure reliability, validity, and trustworthiness, I used an established design suggested for action research. I used a convergent mixed-methods design collecting both quantitative and qualitative data at about same time and giving them both equal emphasis (Mertler, 2014). Combining the strengths of each form of data in order to understand the research problem "leads to greater credibility and overall findings to the extent that the two sets of data have converged and indicated the same or similar results" (Creswell, 2005, p. 100). The pretest and posttest, the student perception surveys, and the student flashcards created on Quizlet are sources of the validity and trustworthiness. The students were given a pretest and the same test as the posttest that was developed by the iCivics teachers in the district. Students throughout the district in iCivics classes have been given this test in the past, and it has proven reliable due to past scores reflecting a bell shaped curve, representing stability and consistency. Reliability and validity are interconnected, so the tests have to be reliable in order for the interpretation of the scores to be used as sound evidence to demonstrate that the test matches its proposed use and is valid. The pretest and the posttest were administered at two different times to the same participants after a two-week unit of study. The data provided by the student perspective

surveys also increases the validity and trustworthiness of the study by providing me with student views that do not reflect teacher-researcher bias. Student-created flashcards were analyzed to see which students used the schema development strategies based on the use of accretion, tuning, and reconstruction of existing schemata. The summative assessment scores were then analyzed for the students who used the schema development strategies to provide validity to the findings of the study. Using multiple data sources and multiple data collection methods and then converging the data into an analysis of findings provides validity to the study.

Even though I am using an accepted qualitative research method for the study, the validity of the findings is affected by the limitations discussed in Chapter 1. Two major factors—sample size and students leaving the study—particularly affect the transferability of the study. The sample of students was a convenience sample because it was all of the students in my seventh-grade iCivics classes, which consisted of 48 students. Also, the mortality rate, or students who left the study, was high due to absences at the end of the school year, which did not allow students to complete all parts of data collection. The small size of the sample and the high mortality rate negatively effects transferability.

Developing an Action Plan

"Action plans are formal or informal plans that follow from the results of action research, designed to guide either future cycles of action research or strategies for implementation or both" (Mertler, 2014, p. 305). Following the analysis of the data, I interpreted the results, wrote final conclusions, and formulated a plan of action for the

future. The action plan consists of strategies for the future implementation of the intervention, revisions and improvements to my instructional methods, and my proposal for future action research cycles (Mertler, 2014). Action research is a reflective teaching process that allows the team to research and to analyze a methodology's effect on student learning. Developing an action plan is one of the most important parts of an action research project, so my reflections on the findings of the study will guide my recommendations for actions related to my specific research questions.

Conclusion

In Chapter 3: Methodology, I addressed my research questions by explaining the rationale for using the convergent mixed-methods approach and the key tenets of action research, describing the context within which the study took place and the participants involved and their role, and the research methods used. The validity and transferability of the methods are discussed as well as ethical considerations. The next chapter will consist of a complete description of the findings, organized by the data collection tools, a discussion containing my interpretation of the findings, and how this will affect my future actions. Finally I will reflect and conclude on how these results will influence my action plan.

Chapter 4: Findings and Discussion

Research Questions and Methodological Approach

This action research study examined how mid-level social studies students construct their knowledge of essential vocabulary using the games and study modes of the flashcard-making application Quizlet to develop schema while interpreting vocabulary. It also attempted to discover how the full use of Quizlet impacted student achievement and affected student perceptions of achievement. The following research questions were explored during the study:

1. How does using schema development strategies impact student achievement?
2. How does the effective use of Quizlet as a formative assessment tool impact student achievement?
3. How do students perceive the impact of Quizlet on their academic success?

To answer these research questions, I implemented a convergent mixed-methods action research design (Creswell, 2014) by collecting both quantitative and qualitative data. Quantitative data was analyzed using descriptive statistics and frequency distribution tables provided by Schoology and Quizlet. Qualitative data was analyzed using the report generated by Survey Monkey. These quantitative and qualitative data

were then analyzed together, as prescribed by the mixed-methods approach (Creswell, 2014). To explore the findings of the two research questions, each question will be discussed in the following subsections: Findings: Research Question 1and 2 and Findings: Research Question 3. The remainder of this chapter consists of a description and presentation of the findings, followed by a discussion of how this data influences future action and an interpretation of the data. The chapter concludes with a summary of the findings, a discussion of the research questions, and an introduction to the action plan discussed in the final chapter.

Findings: Research Question 1 and 2

To explore how schema development impacts students' success on summative achievement, a digital pretest, posttest, and summative posttest, along with pen-and-paper formative and summative assessments were given to students throughout a learning unit pertaining to the concepts of propaganda. The pretest, posttest, and summative posttest were created, taken by students, and analyzed using the digital learning management system, Schoology. Schoology allows teachers to create testing and quizzes to assess students' baseline knowledge via pretest and their grasp of materials via posttest. Schoology has the ability to propagate students' scores on these tests and aggregate the data using a normal distribution graph that includes the number of grades, maximum points, highest grade, lowest grade, average grade, standard deviation, median, and mode. Schoology also provide statistics that shows how students perform on each question.

The action research study was performed using two seventh-grade classes. Class A had 20 participants and Class B had 28 participants. On the pretest, Class A had a

median or average of 50.04%, with a standard deviation of 24.64% (see Figure 4.1), and Class B had an average of 55.65%, with a standard deviation of 22.2% (see Figure 4.2).

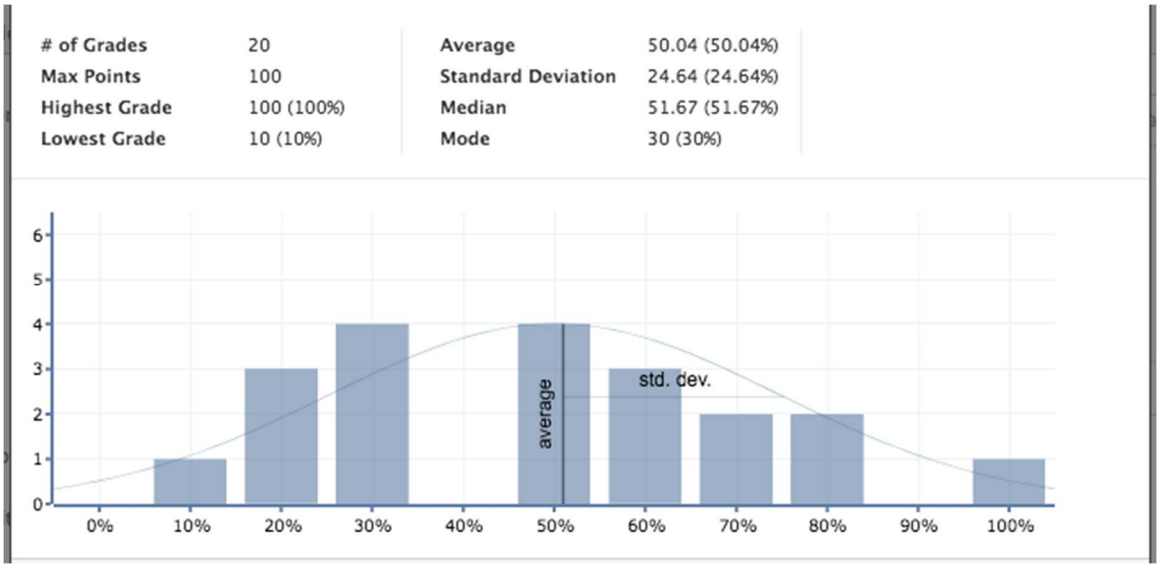


Figure 4.1 Class A pretest

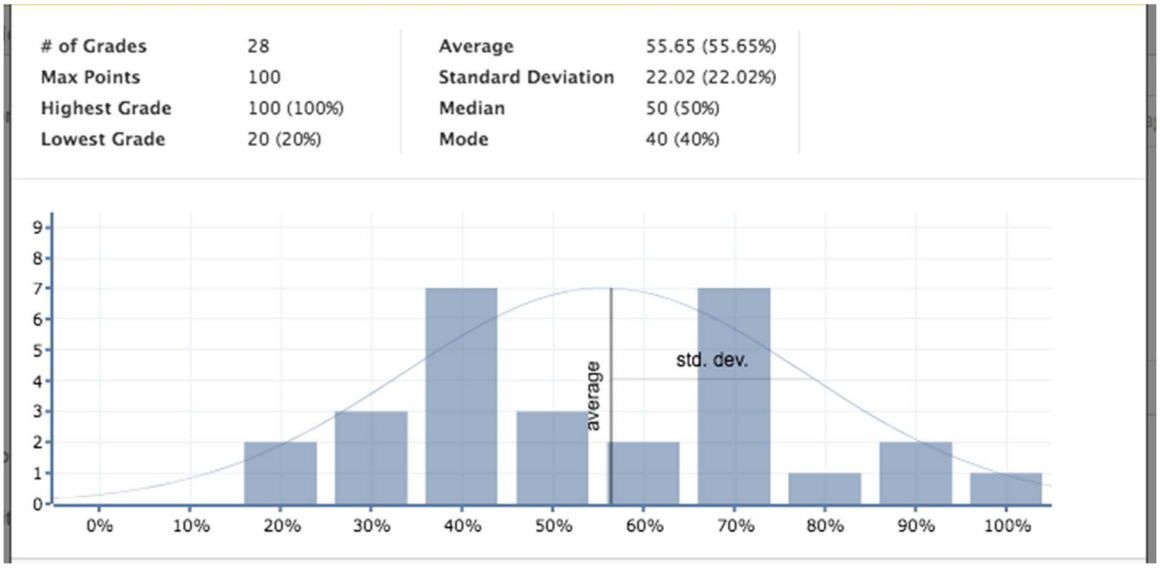


Figure 4.2 Class B pretest

On the posttest, the Class A median was 60%, with a 31.62% standard deviation (see Figure 4.3), while Class B also had a 63.21% average, with a 28.79% standard deviation (see Figure 4.4).

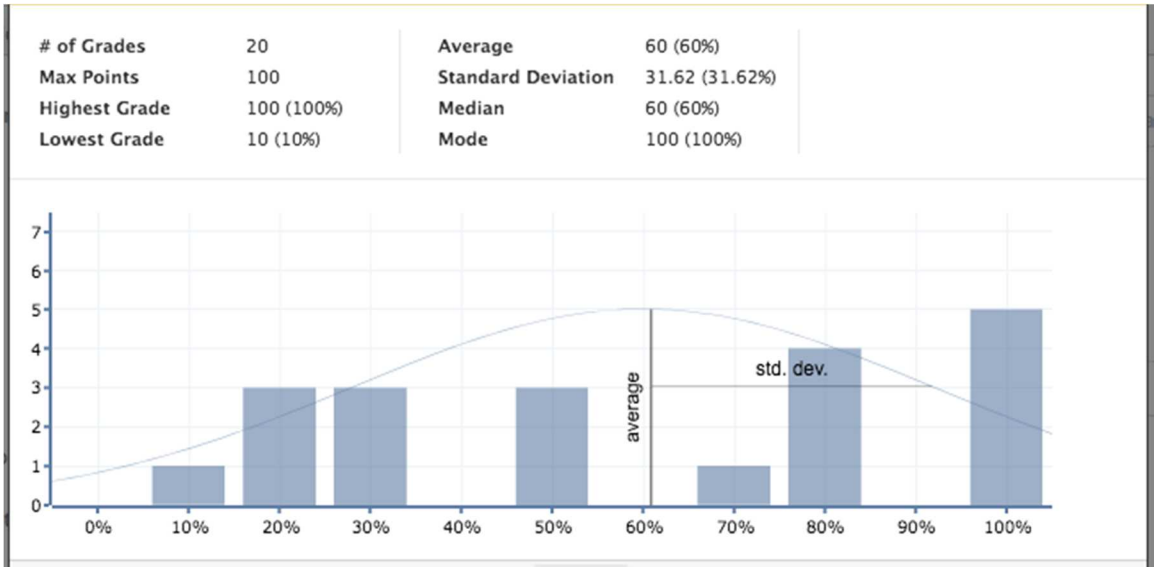


Figure 4.3 Class A posttest.

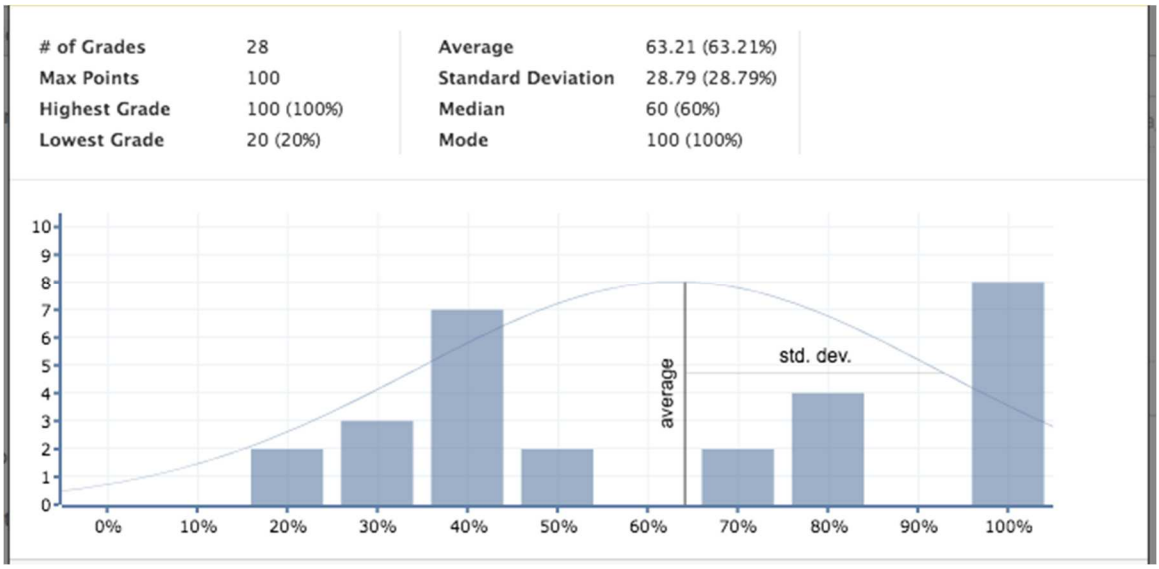


Figure 4.4 Class B posttest.

The pen-and-paper assessments yielded the following results: Class A had a mean or average of 76.5%, a median of 85%, and a mode of 92%, with the standard deviation of 23.76% (see Figure 4.5). In the final analysis, one student who was a sixth grader and a student from the ED class who was absent on the day assessment were omitted. After removing the students and their scores, the statistics reflected little change in mean, median, and mode, but the standard deviation changed to 13.39%.

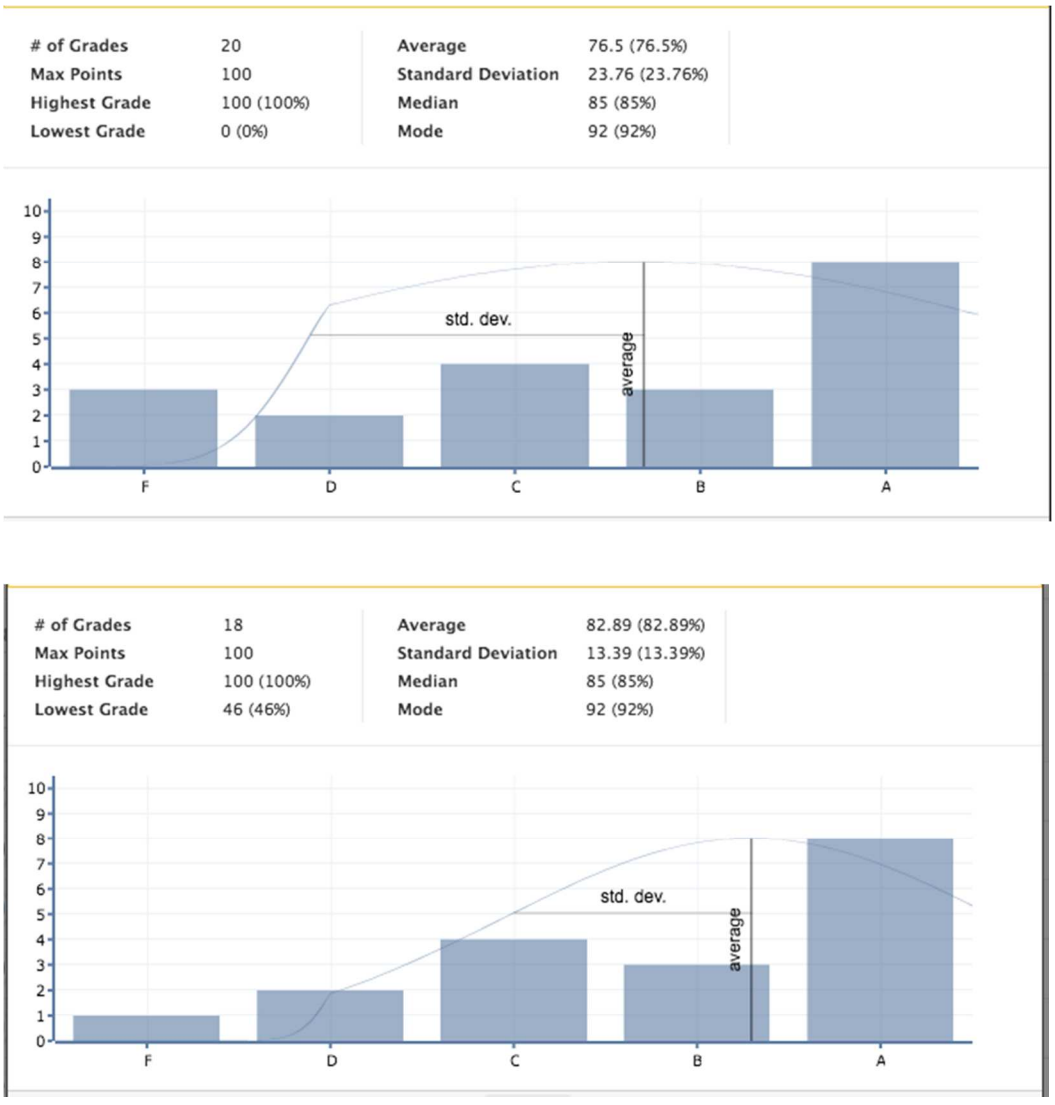


Figure 4.5 Class A pen-and-paper formative assessment on propaganda.

On the same assessment, Class B had a mean or average of 77.29%, median of 85%, and mode of 85%. One student was absent for this assessment and was omitted, which changed the statistics to an average of 80.15%; the median and mode stayed the same, but there was a change in statistical deviation to 19.44% (see Figure 4.6).

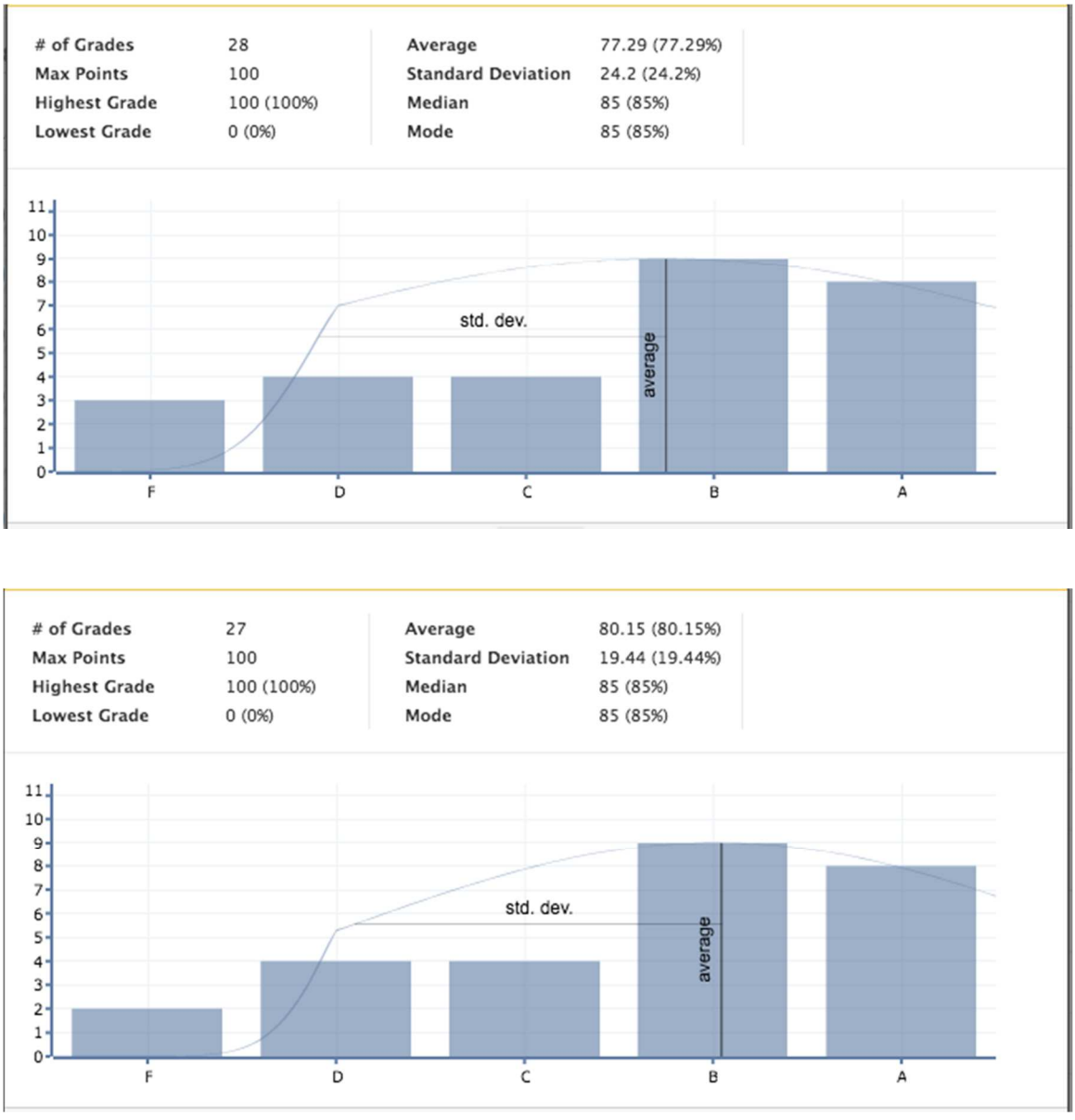


Figure 4.6 Class B pen-and-paper formative assessment on propaganda.

The pen-and-paper summative assessment statistical information is as follows: Class A consisted of 20 students and had a mean or average of 62.9% with a 23.33%

standard deviation, median of 72%, and mode ranging from 73–83% (see Figure 4.7). Class B consisted of 26 students and had an average of 74.08%, with the standard deviation of 16.53% standard deviation, median of 74.5%, and a mode of 90% (see Figure 4.8).

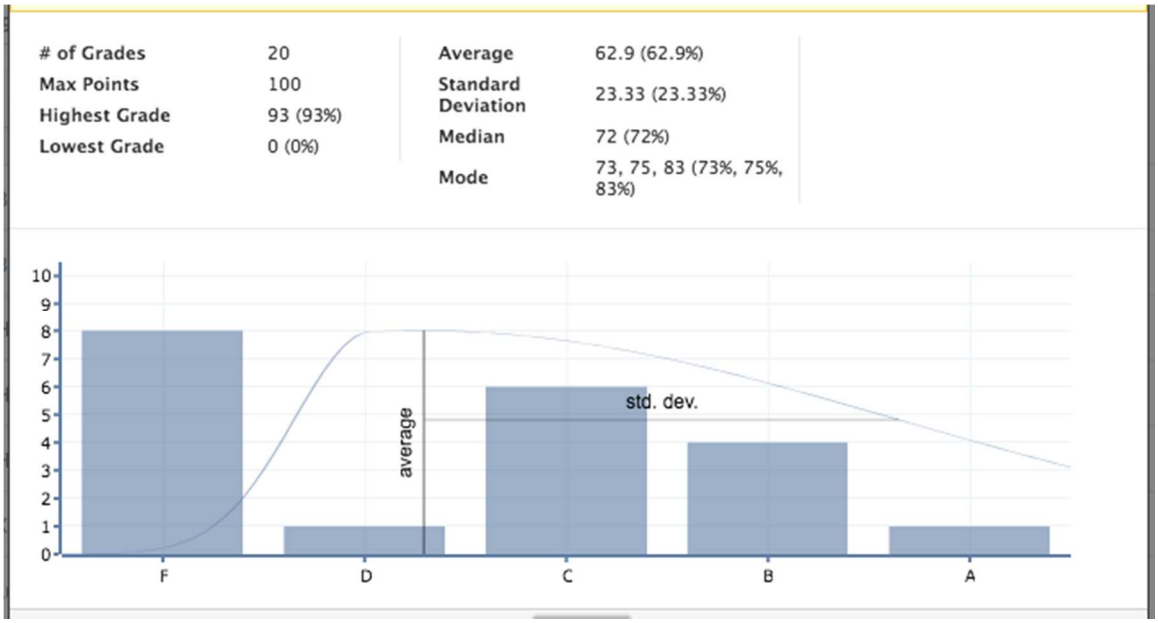


Figure 4.7 Class A pen-and-paper summative assessment on propaganda.

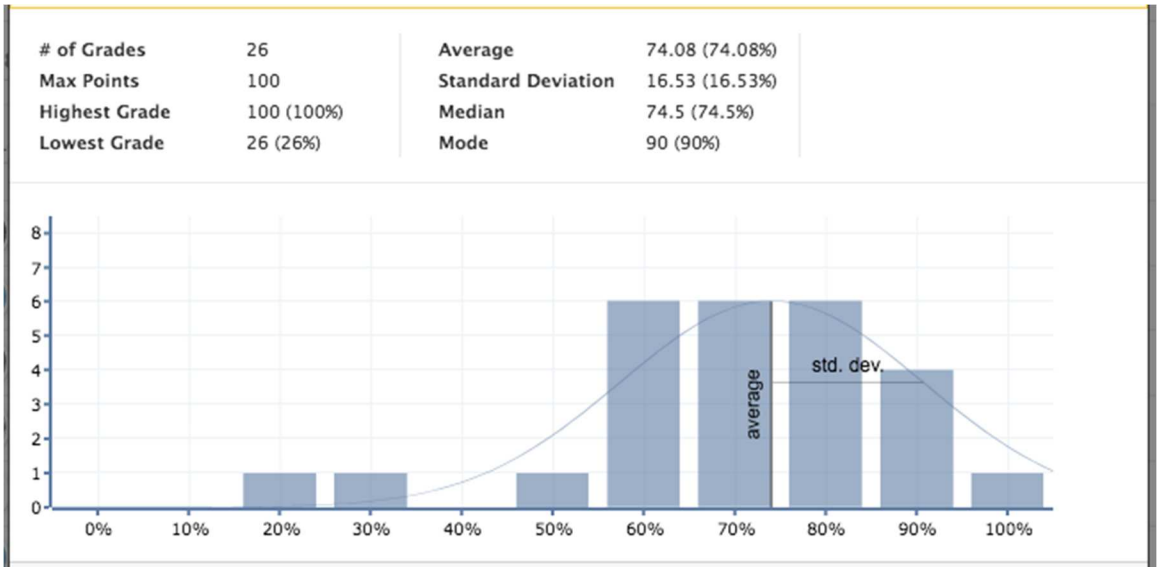


Figure 4.8 Class B pen-and-paper summative assessment on propaganda.

Findings: Research Question 3

Qualitative data was gathered via a 10-question pre-survey and a 10-question post-survey of student perceptions pertaining to the use of Quizlet using Survey Monkey. Both surveys were anonymous, and I was able to evaluate both classes as one class. It was important to find out if students had their own Quizlet account and if they had Quizlet downloaded on their personal cell phone: 70.21% of students had a personal Quizlet accounts and only 6.38% of students participating in the study had Quizlet downloaded to their personal cell phones. To decide if a tutorial needed to be done on how to use Quizlet, questions were asked about use of Quizlet in other classes: 93.62% of students reported using Quizlet currently in another class, and 84.44% of students reported that they used Quizlet in at least four of their core classes. With this information, I established that the students did not need a tutorial or any additional instruction on how to use Quizlet. Students were asked how many times per week they used Quizlet and how they responded when teachers ask them to use Quizlet: 71.74% of students responded that they used Quizlet one to two times per week, and 68.9% said that when teachers asked them to use Quizlet, they did so willingly. When students were asked which of the seven available Quizlet study modes or games they used most often, students reported they used the study mode call the Match most often, followed by Flashcard, then the study mode Test, and finally Quizlet Live. Students were asked if Quizlet helped them be successful on formative assessments: 82.98% of students reported that it did. Questions were asked if Quizlet helped them to be more successful on summative assessments: 76.60% of students reported that it did (these percentages do not add up to 100 because students were instructed to chose all that apply). The survey ended with a question asking students

about the ease of use of Quizlet, and 46.81% reported that it was very easy, 40.43% reported that it was easy, and 12.77% reported that it was neither easy nor difficult.

On the student perceptions post-survey, students were asked how important they thought learning vocabulary was to doing well on the end of year standardized testing: 74% students said that it was very important. Some educators in my school district believe it is better to teach vocabulary as a whole part of the lesson rather than at the beginning or the end of the lesson, so students were asked when they preferred to learn vocabulary: 65.22% of students prefer to learn vocabulary at the beginning, 30.43% prefer to learn it as a whole part of the lesson. A pattern has been observed of students copying and pasting information to flashcards in other classes throughout the school, so the question was asked as they were making their flashcards for the propaganda lesson by a copying and pasting, writing their own definitions, or typing the definition from memory: 69.57% copy and pasted their definitions from the Internet, 17.39% wrote the definitions in their own words, and 13.4% typed the definition into the application from memory.

Some applications are downloaded for every student, school wide. Quizlet is not one of those applications. So the question was asked at what point students downloaded Quizlet to their iPad: 60.87% of students reported that they downloaded Quizlet before this unit in another class; 39.13% reported that they downloaded the Quizlet application when I asked them to do it prior to this learning unit. Students were asked about downloading the Quizlet application to their personal cell phones, and 56.52% of students reported that they did not download the application to their phone because they did not want to put an educational application on their personal cell phone; 30.43%

acknowledged that they did not do this because they did not have room on their cell phone. Only 13.4% downloaded Quizlet to their personal cell phone because they wanted to be able to study at any time they had access to their phone. As teacher-researcher, I shared with the students what the summative assessment questions would look like and told students that they could change their flashcards in any way they wanted to. When asked if they changed their flashcards, 91.30% of students claimed to have added pictures and examples because that is what the summative would look like, 21.74% of students said that they did not make any changes and that they just continue to study what they already had, and 8.7% of students reported that they added pictures and examples but they did not understand the examples that they added.

Students were asked to create a Quizlet Live game in their collaborative groups. They were asked on the survey if this helped them to pass the summative assessments for this unit: 56.52% of students responded yes and 43.48 % of students responded no. Mueller and Oppenheimer's (2014) study referenced in the literature review inferred that handwritten flashcards are still the better method for student self practice, so the students were asked if they felt they would they have done better on the summative assessments if had used written flashcards to study instead of using Quizlet, and 78.26% of students answered No.

The six iCivics teachers in the district collaboratively created the pretest (see Appendix A). The format was a matching test containing 10 vocabulary concepts and 10 basic definitions. The vocabulary concepts were symbol, name-calling, bias, card stacking, propaganda, transfer, plain folks, bandwagon, endorsement, and glittering

generalities. The posttest was an exact duplicate of the pretest. The pretest scores for both classes averaged 50–56%, and the posttest scores for both classes averaged 60–63%.

At first glance, these statistics reflect little growth, but this was before I analyzed student flashcards created through Quizlet for evidence of the use of schema development strategies and before I coded student effective use of study mode and games. I read individual students' flashcards and made a table to code whether students used the three schema development strategies—accretion, tuning, and reconstruction—facilitated by the teacher-researcher. Accretion, tuning, and reconstruction are operationalized in the following way. To activate existing knowledge, students were asked during the introduction of the lesson what came to mind when they heard the word "propaganda." A majority of students said "fake news," with a few students adding "yellow journalism." Students were instructed to let their own existing knowledge be the first thing they put on their flashcard. I provided a movie example—"Mr. Smith Goes to Washington"—as an example of propaganda, comparing it to the "yellow journalism" of the Spanish American War. Informational text (Appendix H) was given to the collaborative groups for students to read aloud, and I asked them to discuss the pictorial examples explaining the seven major types of propaganda. I used the informational text to help student tune their schemata. After I facilitated tuning, I asked students to explore the Internet to find their own pictures, movies, and commercial media examples to place on their flashcards. Once students had done this, they were asked to explain in their own words the meaning of they examples they chose and how they defined or helped the students to interpret the vocabulary concept. So, when the flashcards were evaluated for vocabulary schema development, each card for each propaganda type or associated vocabulary term had to

contain three things—the idea that came to mind when they heard propaganda, a pictorial example (such as a political cartoon or commercial for a product or person), and the explanation in the students own words—for the student to be considered as having developed new schema for that vocabulary concept.

The data from the Quizlet use frequency distribution (Appendix K) revealed that 20 out of 48 students used four or more of the study modes or games available through the Quizlet online application. The student schema development frequency distribution (Appendix K) showed that 16 out of 48 students used all strategies for schema development. Figure 4.9 and 4.10 are statistical graphs for 21 students who remained after attrition. Figure 4.11 and 4.13 are graphs of 21 students who were contained in both sets of data schema development and Quizlet use, along with two students who made a 100 on the pretest.

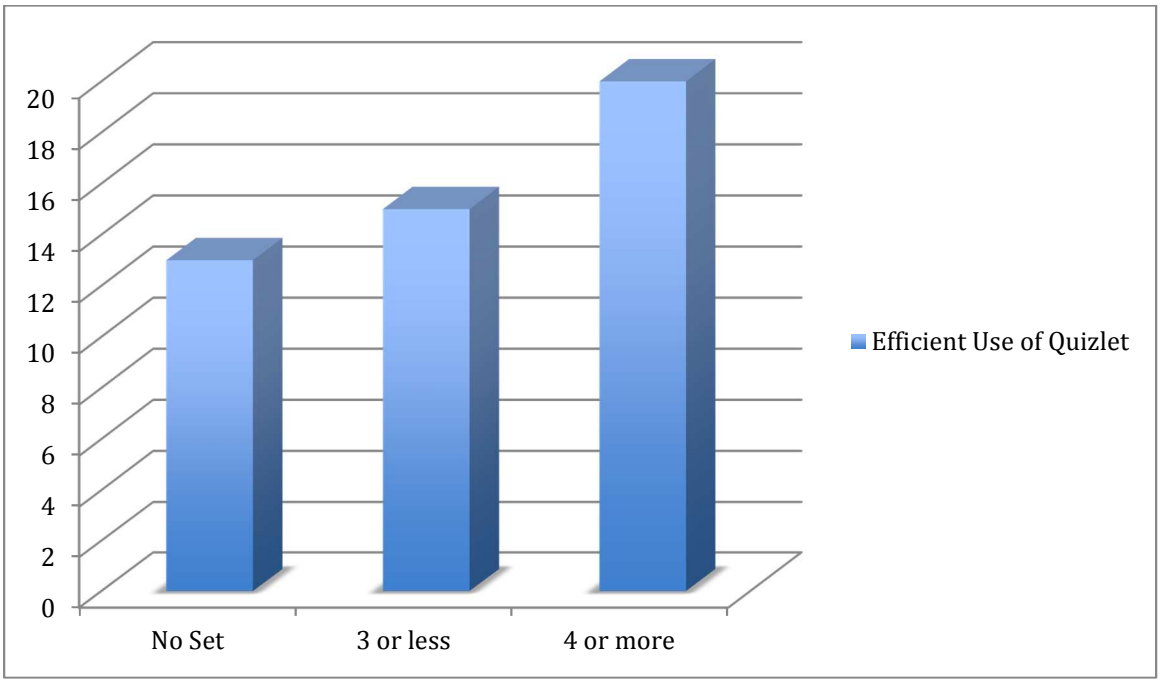


Figure 4.9 Efficient use of Quizlet.

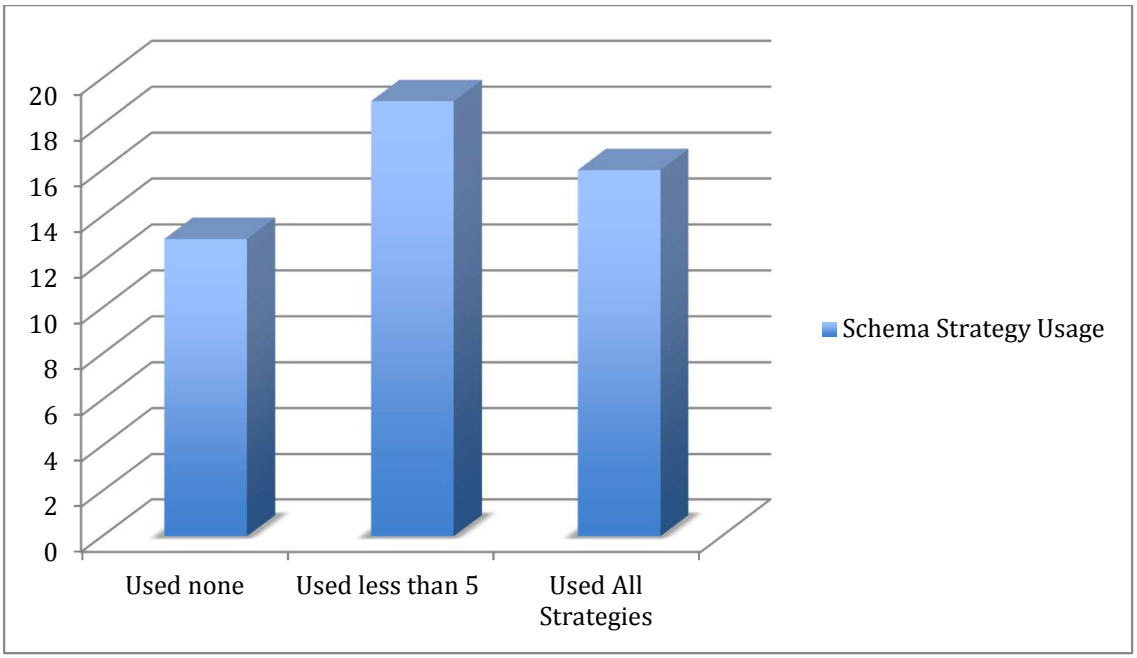


Figure 4.10 Schema strategy use.

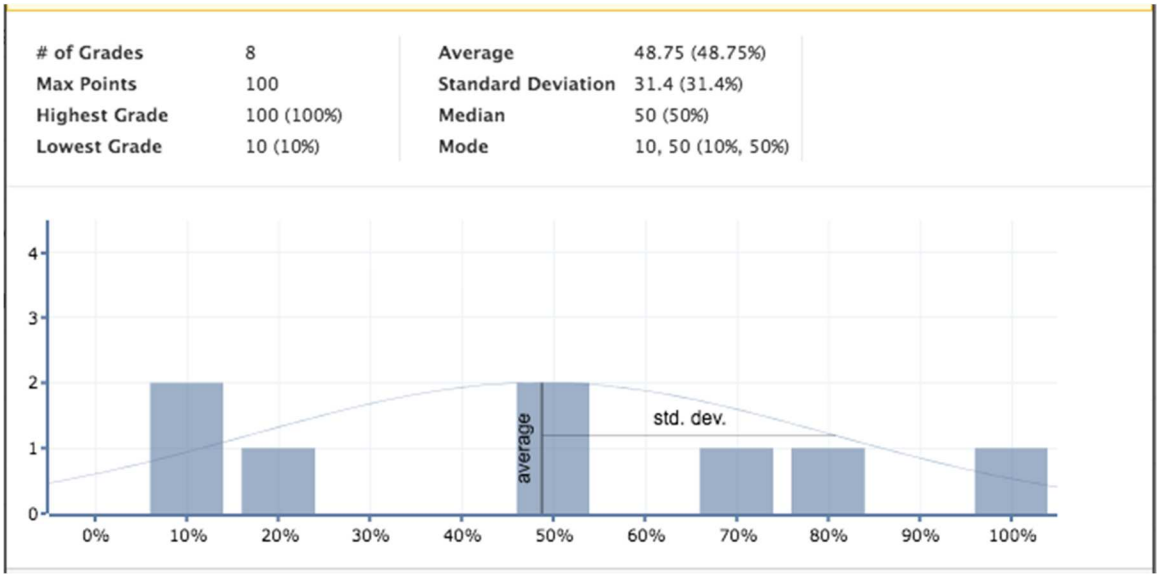


Figure 4.11 Class A pretest subset of target population.

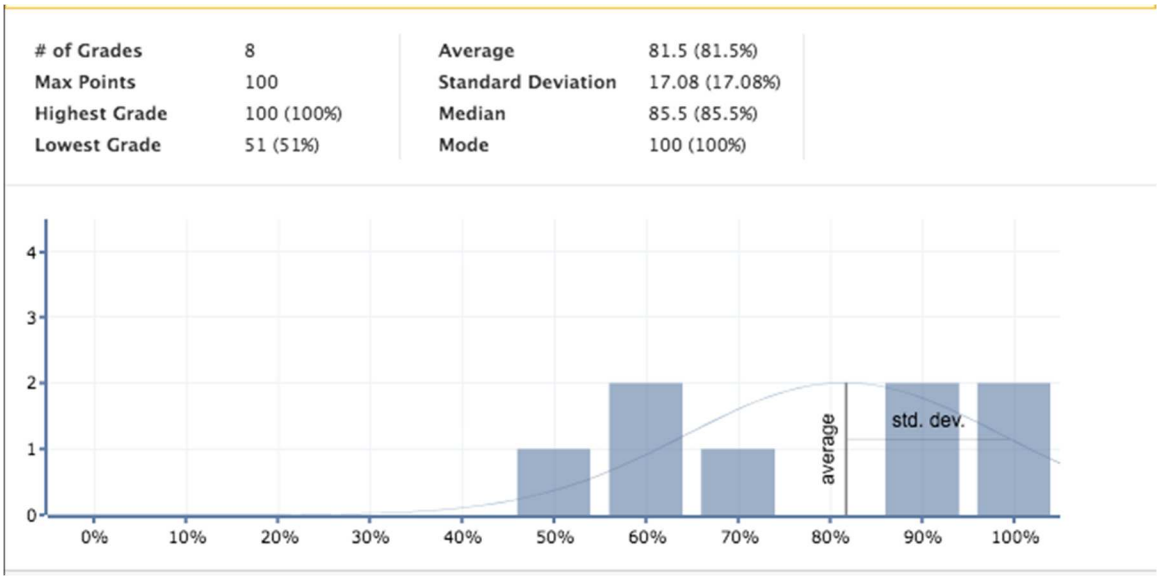


Figure 4.12 Class A posttest subset of target population.

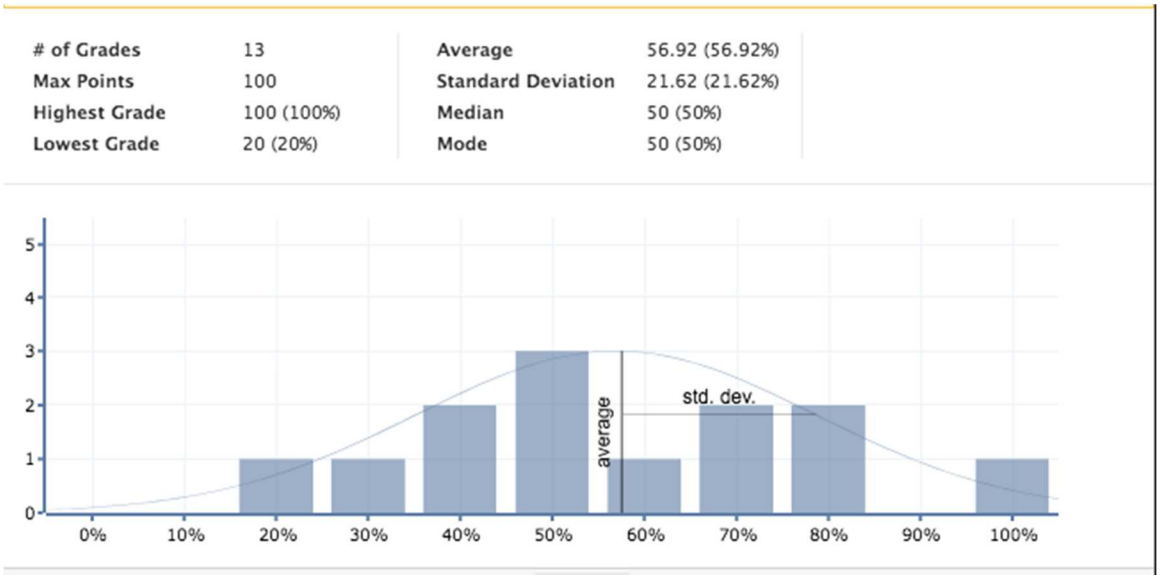


Figure 4.13 Class B pretest subset of target population.

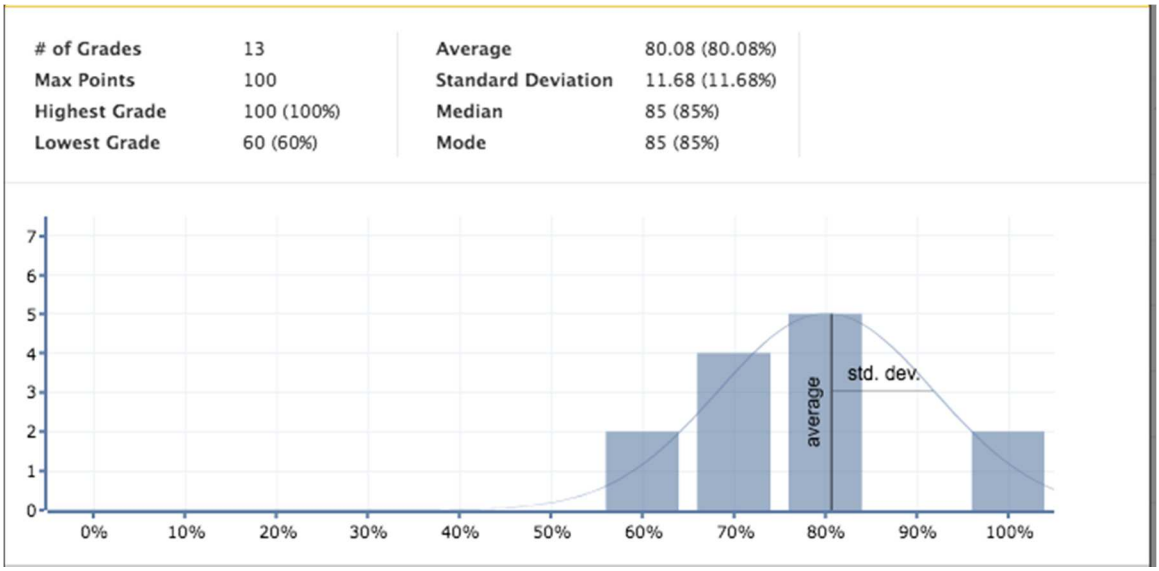


Figure 4.14 Class B posttest subset of target population

Discussion

This study focused on exploring the role of schema development and its impact within the digital vocabulary application Quizlet. The vocabulary that was used in the lesson pertained to the concept "propaganda." There were 10 essential vocabulary concepts that were assessed in a quantitative way through a digital pretest, posttest, post summative assessment, a pen-and-paper formative and summative assessment, and student documents from Quizlet. The qualitative data was gathered through an anonymous survey produced by Survey Monkey. This discussion section is organized by data collection method.

The pattern of students doing well on formative assessments but not as well on summative assessments was also confirmed by the statistical data of this action research study. The impact of schema development of vocabulary concepts on summative assessments was positive for students whose student documents showed evidence of

using the schemata developing strategies and for those students who used four or more Quizlet study modes or games. Using a convergent mixed-methods design, merging qualitative and quantitative data that were gathered simultaneously, was the best choice for this study because of all of the different roles that the teacher and students had to play. The results of the data collection and descriptive statistical analysis indicated that when students created their own schemata, they performed better on summative tests. Additionally, this data and analysis indicates that if students used Quizlet to its fullest, using at least four out of seven study modes and games, they were more successful on summative assessments.

There were several students who were removed from the data because of too much missing data due to age and grade level of student absenteeism and disciplinary issues. All 48 students completed the pretest. Eight students did not complete the post summative test. One of these eight students was a sixth grader, who was omitted from the study, and all of the other participants are in the seventh grade. Another of these eight students was a student with an emotionally disability and whose behavioral intervention plan kept him from coming to class during part of the study. As a result, he was also omitted. The other six students who were omitted were students who did not complete all parts of the study, including the post summative assessment, due to absenteeism. There were six students who were in English language arts response to intervention support classes and three students who received services in the special education department. The students with their own challenges with reading comprehension and vocabulary development had a negative impact on the statistical results but could not be considered outliers and therefore be omitted. I had one student who had to miss 21 days of class in

one semester. There were 12 students across both classes who did not meet the basic level of proficiency on vocabulary standardized testing.

All of the data was computer generated. Schoology, the district's learning management system, created all of the normal distribution graphs. Survey Monkey, the online survey generator, created all of the statistical data from the teacher-researcher-created surveys. Quizlet, the online flashcard generator, created the student documents that provided data pertaining to schema development and also provided a frequency distribution listing the use of each study motor game by each individual student in the class.

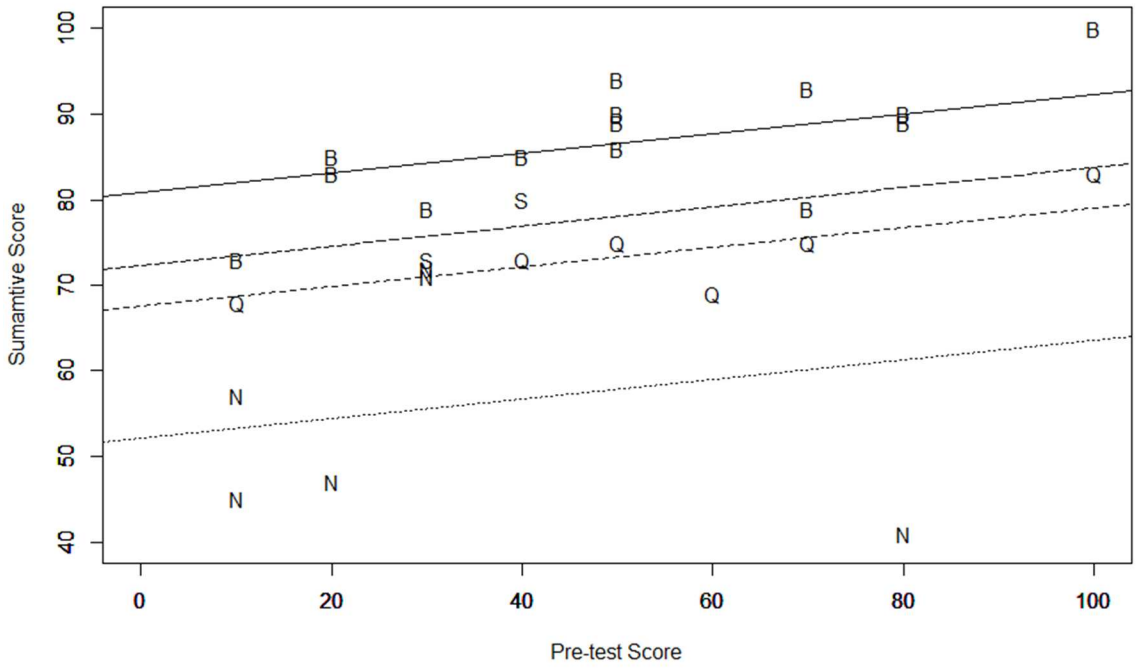


Figure 4.15 Plot analysis of covariance to predict summative score.

Twenty-eight of the students have complete data for addressing Research Questions 1 and 2 simultaneously to assess the effects of Quizlet usage and schema usage

on the summative score, with pre-test score included as a covariate. This data can be displayed visually as it would be in an analysis of covariance (Creswell, 2013) as seen in Figure 4.15. Here the B and solid line represent those who completed four or more Quizlet study modes and games and used all of the schema development strategies, S and the long-dash line for those who used schema development strategies but not fully use Quizlet, Q and the short-dashed line for those who fully used Quizlet but not schema development strategies, and N and dotted line for those who had neither. As seen in Figure 4.15, both used Quizlet fully and used all schema development strategies corresponded to higher summative scores, with the combination being higher than either separately. These two effects were significant with *p*-values less than 0.005. The interactions of Quizlet and schema with pre-test score were not significant at the 0.05 level.

Reflection

The informal interviews, student comments, and student questions gave importance to the findings of this action research study. I was unaware that teachers were the ones who usually created the flashcard sets and Quizlet Live games. However, if the teachers create the flashcard sets for the students, this does not allow students an opportunity to create their own knowledge by using schema developing strategies or interacting with the text other than the use of Quizlet. Also if the teachers create the Quizlet live games, students are not engaging in one of the most important parts of constructivist e-learning best practices: creating their own knowledge, using that information to create the flashcards, and then publicly sharing a final media product. Students reported that they were doing well after playing the Quizlet Live games created

by their teachers, but they also reported that the teacher-created Quizlet Live games' information was very similar to the summative tests that they were taking. If this is truly the case, I would like to see teachers at my school use the SAMR model discussed in Chapter 2 to guide future technology integration planning. Several students commented that when they encountered novel vocabulary words for the first time, it felt like having to learn a foreign language. These same statements also indicated that when these students took standardized tests, they did not do well when there were novel vocabulary words in the text.

This action research study was undertaken in an elective class in which students were less concerned with the grade that they receive. It would be interesting to replicate this study in a core social studies class to see if students would have a better work ethic and be more motivated to be successful. I overheard a conversation of a student who was assigned lunch detention because of repeated off-target behaviors in which the student said he was not going to try to do well on this unit because it was part of my study.

If I could change one thing about the study, it would be the timing. The district office did not approve my study until right before standardized testing and asked me to wait until after standardized testing to begin. I would have had fewer students leave the study due to absenteeism if I had been able to complete the study before standardized testing and not at the end of the school year when students have already started to disengage.

Conclusion

This action research study asked the following research questions:

1. How does using schema development strategies impact student achievement?
2. How does the effective use of Quizlet as a formative assessment tool impact student achievement?
3. How do students perceive the impact of Quizlet on their academic success?

This chapter reported the findings and discussed the two research questions of my action research study. Through the implementation of action research, I engaged in planning, acting, developing, and reflecting (Mertler, 2014). As a reflective teacher, my last stage involves reflecting and designing an action plan that makes suggestions for immediate change and improvement in my method of teaching and planning lessons. The action plan will focus on planning and providing professional development for other teachers in my school that implements SAMR to guide them in planning rigorous lessons that integrate technology.

Chapter 5: Conclusion and Action Plan

Reflection

Mertler (2014) stated that for a teacher to "critically examine her or his practice, that person must engage in systematic reflection on the practice" (p. 44). In this reflection stage, the teacher-researcher communicates the results of the action research study and summarizes the findings of the study, reflecting on the process by "introspectively examining" (p. 258) the practice studied. The reflection section of this study consists of a self reflection, implications for personal practice, implications for P–12 learning, and implications for future research and practice. As demonstrated in the Chapter 4: Findings and Discussion, students who applied the strategies for developing new schemata within the use of the digital application Quizlet saw an increase in achievement. Additionally, students' perceptions regarding the use of Quizlet were positive, but as teacher-researcher, I continued to see a pattern of students using their iPads to copy and paste information, thereby reinforcing rote memorization instead of creating their own schemata. As a result, these students earned low scores on summative assessments. The previous chapters addressed the research plan, data collection and analysis, and a discussion of the perpetual cycle of action research. This chapter completes the process of one cycle by reflecting on the study and planning for future implementation.

Self-Reflection

After completing my action research project, my initial thought was that I wished I could start over and facilitate it better. One of the things I would have done differently is to engage in self reflection on a daily basis. Although this was a unit of study that I had taught for the two years prior to undertaking this study, the schema development strategies stressing accretion, tuning, reconstruction, and incorporating the best practices of constructivist e-learning were new to me. I feel that through daily reflection, I could have monitored and adjusted to improve the complex process of converging schemata development with integration of technology through a constructivist approach. For example, after the data analysis, I realized students were doing a great job of "faking me out," or pretending to use the prescribed study mode or game, when they were working in the Quizlet application. Over half of the students in the study did not use the application to its fullest: They stuck with the study mode or game that they liked the most but did not use the other functions in they the way I had integrated them into schema development to tune and reconstruct their existing schemata. Additionally, students worked in collaborative groups daily, but I should have reconstructed grouping so that students who were struggling could be with students who were actively engaged in creating their own schemata for the propaganda vocabulary concepts. I also should have analyzed the Quizlet feedback on a daily basis, since the study was only 10 days long. This would have given me the information I needed to scaffold the learning of the students who were struggling with certain concepts and alerted me to more closely monitor their use of Quizlet.

From day one, I felt like the lesson itself went well and students were interested in discussing and thinking critically about propaganda. Students immediately accessed their existing schema, connected this to the concept of yellow journalism, which they had learned about previously in their social studies class, and the term "fake news," which led them to ask about what makes news fake or not real or untrue. The learning goals of constructivism, critical thinking, and reasoning were achieved in the lesson, as evidenced by their enthusiastic questions and collaborative discussions. Also, students experimented with social negotiation in their collaborative groups, one of the conditions emphasized by constructivism (Driscoll, 2005) by choosing the student's cards in their group that were the best for the Quizlet Live game. Further evidence was when students seemed to take ownership of their learning using technology as a formative and motivating tool to learn novel vocabulary concepts. After reflecting on the teaching and learning process in this action research study, I do feel that I provided interesting examples of propaganda, including movies, political cartoons, and commercial media, but I still had students asking me if they could copy and paste definitions from the Internet. I did allow them to do this because of the study, but I encouraged them to create their own learning by summarizing it in their own words to find their own examples and to find examples that they understood.

Because I was teaching an exploratory class instead of a core subject, as I had done in the previous 20 years, I forgot how important standardized testing and state standards can be to the planning of a core teacher. When students reported that teachers were creating the flashcards and the Quizlet Live games for the students, I was surprised and did not understand. I frequently collaborate with a seventh-grade teacher who used to

be on my sixth-grade core team, and he told me that using the application in this way was a method of beginning with the end in mind—basically a backwards design. During this study, I realized that Quizlet flashcards are only as good as the information put on the cards. Even if a student is using all study modes and playing all games in Quizlet, if the information they created on the flashcard is not correct or rich enough, the basic definition is not going to help them apply information to higher-order thinking summative assessment questions. Maybe this is why the teachers created the cards and created the Quizlet Live games for all students.

The narrative at the beginning of this study paints a picture of the implementation of one-to-one computing for middle school learners using iPads.Teachers in my district are expected to integrate technology into their lesson plans. At the beginning of the study, I had planned to use the SAMR model as another layer to support the idea of building vocabulary schema with the integration of technology. But upon reflection, I realized that SAMR is actually a model for teachers to use when planning their lessons to gauge whether they are at the enhancement phase or the transformation phase of integrating technology into their lesson planning. I feel that action research helped me to inform my own practice and have a better understanding of why students struggle with creating their own learning through vocabulary schema development. Taking into account my own self-reflection and the elements of my study I would change, I plan to replicate this study next year with the same learning unit but at a different time of the year—not at the end of the year, when students are tired of learning and are leaving early for summer vacation. I teach sixth-, seventh-, and eighth-grade students, so I would like to have all three grades of participants in this future study.

Implications for Personal Practice

I plan to continue using the cycle of action research in my personal practice, along with schemata development strategies and the constructivist approach to e-learning. My school district advocates 21st-century learning as part of their mission statement, and the intentional practice of action research by teachers is the process to make this a reality. When meeting with the research approval committee at the district level, I suggested integrating action research as a professional development process that could be incorporated into the current goals-based evaluation the district now uses. This would create a collaborative action research initiative in which teachers are researching in their own classrooms to improve their own methodology and, most importantly, provide students with a more engaging learning environment.

This desire to create a collaborative action research initiative is an extension of my desire to be a leader in my school community. Thomas Sergiovanni (2013) suggested there is a crisis in today's educational leadership that currently relies on direct leadership styles like command leadership and instructional leadership and that both of these types of leadership imply the incompetence, indifference, and disabilities of teachers. This crisis evolved from the teachers' need to see their leaders as partners in education and the need to work collegially to learn with and from them. Seeing their teachers as partners is a challenge facing nontraditional school administrators who strive to become leaders of leaders. It is my goal to recreate myself into a leader of leaders.

As a future curriculum leader, I would catagorize myself as a servant-leader, as described by Sergiovanni (2013) in *Leadership as Stewardship*: a leader who will do whatever it takes to meet the obligations and responsibities with a deep commitment to

values and moral authority, and one who deserves the allegiance of colleagues and authority granted by them because of their servant heart. I want to serve first, thereby building trust, so stakeholders have confidence in my competence and values, which are strengthened by my judgments based on these competencies and values, rather than self-interest.

As a leader of leaders, I will work hard to build teacher-leaders so that direct leadership is not as necessary. I plan to do this through team building, leadership development, and shared decision making, and by establishing a collegiality covenantal community. To build a collegial covenantal community, I will want to build a school centered on the shared values of the mission and vision statement. The mission of my school is to produce successful lifelong learners by cultivating students' confidence, creativity, and intellectual independence. The vision states that through a shared responsibility in learning, the students will become self-advocating global citizens who are technologically advanced, creatively thinking, and self directed. Sergiovanni (2013) refered to this as *purposing*: the process where the community holds share beliefs and uses them to make sensible decisions based on them.

Sergiovanni (2013) also described *empowerment* (along with purposing) as a practice of servant leadership. Empowerment of teachers is what creates teacher-leaders. As a future servant-leader, I can empower teachers through shared decision making to develop other teacher-leaders. These teacher-leaders will naturally create teams that support their ideas and interests. My goal will be to allow teachers to assume leadership roles, relinquishing my power and authority to achieve shared goals and purposes.

Implications for P–12 Learning

In his 2014 book book *Revitalizing Curriculum Leadership*, Dale Brubaker uses the term "inner curriculum" to define what each person experiences in a learning setting that is collaboratively created from the interactions between teachers and students. One characteristic of the inner curriculum is one of empowerment. I feel it is essential in P–12 learning to encourage teacher-leaders to be advocates for the "inner curriculum"—one that not only empowers the teacher but also the student. Brubaker's (2014) underlying theme is one of personal growth and professional development, which mutually nurture one another through creative imagination and self-expression. I feel a unique opportunity exists to enable teachers to become coleaders by increasing their awareness, perfecting their skills, and sharpening their sense of purpose through professional development. For example, this professional development would consist of exploring Steven Covey's *7 Habits of Highly Effective People* (1989). To address probems of practice, we have to recognize that teacher coleaders, who commit themselves to the inner curriculum, adopt a student-centered environment where the learner searches for understanding and is responsible for making decisions during the search. Brubaker (2014) advocated creating an environment of shared leadership in which followers feel a sense of personal responsibility to pursue the covenantal community's vision and are given the power to do so. Standardized testing and the assessment of data drives instruction, but it essential for educators to build covenantal relationships with all stakeholders—students, parents, administrators, district office personnel, board members, and community members. This covenantal framework of shared decision making among collegial leaders lends itself to accomplishing the steps of action research.

Implications and Recommendations

The only policy or procedural implication for my district and others state-wide would be to mandate that teachers address the state standards but not teach to the test. When teachers teach to the test, they are not nurturing 21st-century learners. A mandate like this is impossible to enforce because of the autonomy given to teachers with unique methodology and pedagogy. One example of this autonomy is the decision to teach vocabulary explicitly at the beginning of a unit of study instead of teaching vocabulary throughout the lesson. I do think that teachers should discourage students from exploiting the use of the iPad by copying and pasting information from the Internet, as this does not allow them to create their own knowledge for the longterm. Again, such a policy would be impossible to enforce. I do think teachers should be compeled to implement action research in their own classrooms as part of the district's evaluative process for teachers. I also strongly recommend that districts require teachers to use the SAMR (Puentedura 2012, 2104) to guide them in their future planning of integration of technology.

When my district first implemented one-to-one computing, teachers were required to integrate technology, and we were all at the substitution level of SAMR, where we use this technology as a substitute to do things that we normally would do on pen-and-paper assignments, for example flashcards. Teachers need to have district-wide professional development to move to the augmentation stage, where modifications are being made to redesign tasks. My district has technology integration specialists who should be required to assist teachers to use the SAMR model as a guide to transform what they are currently doing with technology integration by modifying or redesigning significant tasks. By a predetermind time, the teacher should be require to be profecient at the redefinition phase

of transformation, integrating technology that allows for the creation of new tasks that were previously inconceivable. If the district truly wants students to be 21st-century learners, then all teachers should be required to use SAMR as a guide to increase their knowledge of technology integration in the classroom.

Action Plan and Policy Recommendation

The following action plan addresses how the addition of action research and the use of the SAMR model can impact future practice at this rural, middle-level school in the southeast. Developing an action plan is an essential part of the process of action research that gives teachers the opportunity to conduct action research in their own classrooms (Mertler, 2014). Two questions arose while reflecting on this action research study: How can teachers integrate technology at a higher level then Quizlet? And why are all teachers not doing action research in their classrooms to facilitate educational change?

To answer the first question—how can teachers integrate technology at a higher level, for example, by using the Quizlet application—I recommend the SAMR model, which is a framework that teachers use to assess and evaluate how they are using technology in their own classroom. Professional development should be provided to introduce teachers to the model, and a survey should be completed by the teachers to allow them to decide where they believe they are on Puentedura's continuum of technology integration. After the survey, teachers would be asked to produce evidence of how they are currently using technology in their classrooms and in collaborative groups. This evidence would be evaluated, and the teacher would be placed in one of the four levels of integration. Future professional development activities would involve two types

of groupings, where all teachers at the substitution level would collaborate and develop lesson plans to move to the next level of augmentation, all teachers at the augmentation level would collaborate on lesson plans that would move them to the modification level, and all teachers of the modification level would collaborate and then produce lesson plans that would move them to the redefinition level. Once these lesson plans have been created, the groups would be reorganized to have a teacher from each level in a group of four so that each level would have someone who was at a higher level to help the scaffold continue their integration of technology. The technology integration specialist at each school would be responsible for these professional development activities and come prepared with technology examples for each subject area at each level. This process would continue until all teachers are at the redefinition level.

SAMR Model

The action research plan employs a more recent and relevant framework of understanding learning, specifically when utilizing a technological application like Quizlet—the SAMR model developed by Dr. Ruben Puentedura (2014). This model is used to help educators analyze how effective technology is on teaching and learning. The model has two main levels, enhancement and transformation. The enhancement level is broken into two categories, "substitution" and "augmentation," while the transformation level is subdivided into "modification" and "redefinition" (see Figure 5.1).

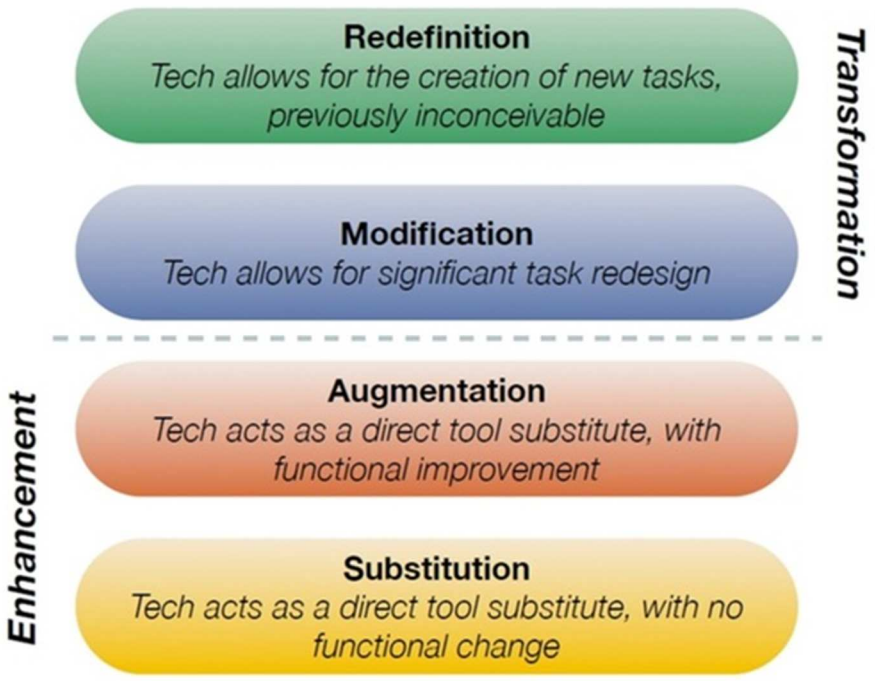


Figure 5.1 The SAMR model.

At the enhancement level, teachers and learners use technology to make learning more efficient. During *substitution*, technology is used to replace an activity usually done by hand, for example, digital flashcards replace written flashcards. During *augmentation*, technology is enhanced by a functional improvement, for example, the digital flashcards are used to study vocabulary concepts and their meanings. At the transformation level, *modification* is used when the task is redesigned: Students may use a matching game or learn study mode instead of flashing the word and its meaning for rote memorization. The students would then share their cards and become peer mentors. In order for teachers and students to operate at the *redefinition* level, they have to create a new task. They might create a game for groups of students to play and then publish it so the whole world could play it. This type of enhancement and transformation builds literacy skills and promotes

the audiences' word consciousness, sense of curiosity about word meanings, and appreciation of nuances of meaning, as suggested by Anderson and Nagy (1993).

I met with the district-level research committee several times, and I asked why all teachers were not doing action research in their classrooms. It was noted that this would be a great way to enhance the current evaluation process for individual teachers. Engaging in inquiry through systematic action research educational outcomes can be affective and a real way to effect educational change: "Engaging in inquiry is a responsibility you accept as a teacher that enables you to take a stand and effect educational change" (Dana & Yendol-Hoppey, 2014, p. 56). It is the responsibility of every teacher to study their own teaching in the immediate context of a specific group of students, a specific curriculum, and a specific school with its specific principal and staff. Through action research, teachers have begun to talk, sharing their concerns and proposing solutions. Action research allows teachers to connect practice to theory, using a cycle of proposing, planning, implementing, observing, recording data, and reflecting.

Action research, as opposed to traditional research, allows the researcher to participate in the study and to conduct a "systematic inquiry into one's own practice" (Mertler, 2014, p. 4). Dana and Yendol-Hoppey (2014) described action research as the "third research tradition," one that "focuses on the concerns of the teacher (not outside researchers) and engages teachers in the design, data collection, and interpretation of data around a question" (p. 8). The teacher-researcher developes her own action research plan and from the "research grounded in the realities of educational practice … which makes it more likely to facilitate change based on the knowledge that they create" (p. 8). If all teachers are going to participate in action research, the district office professional

development personnel will have to work with teachers and administrators during weekly think-tank discussions to to introduce action research, purchase Mertler's, Dana's, or Cresswell's book for the staff, and provide collaborative planning time for this recommendation to come to fruition.

Conclusions

The American dream can be defined as the ideal that every U.S. citizen should have an equal opportunity to achieve success and prosperity through hard work, determination, and initiative. Most people associate this dream with a life marked by material wealth and comfort, and it is widely perceived that the way to achieve the American dream is through education. But it is well known that educational opportunity is not always equal in all areas of the United States. Within the last decade, school districts across America have taken steps to help students realize the American dream by providing technology to all students via school desktop and laptop computers. More recently, districts have gone one step further to provide students with their own personal computing device to try and close the opportunity gap, referred to as one-to-one computing. The goal of district's one-to-one initiatives is twofold: first to provide each student with their on computing device so that socio-economically disadvantaged students have access to a personal portable computing device that does not require the Internet, and secondly, to integrate technology and learning to increase student achievement as part of the 21st-century skills initiative. However, one-to-one computing is an expensive endeavor with little evidence that it increases achievement measured by state mandated high-stakes tests. Cognitive theory may offer an explanation for why there is a significant gap between achievement on formative and summative assessments.

Green and Johnson (2010) claimed that teachers have the power to maximize learning for all students through good assessment practices, which are crucial for providing equal access to educational opportunity. They contended that equal access does not mean that every student should receive exactly the same assessments but that some students may need assessment accommodations and differentiated learning and instructional opportunities to reach a mastery level for certain learning goals. Both believe that assessment is essential because "teacher assessment practices in the classroom contribute to the fundamental right of equal access to education" (p. 5). Assessment is essential and has to be free of bias, for example, using content examples or language based on life experiences in assessment disadvantage. Assessment items not only have to be free from bias; teachers should also avoid scoring biases, be aware of diversity in the classroom, reduce stereotypes, and review accurate representation of abilities, age, ethnicity, family structure, geographic location, religion, gender, sexual orientation, and socioeconomic status. I believe assessments should promote democratic values, and teachers should use ethical guidelines in making assessment decisions. After this study, I vehemently agree that action research and the inquiry stance framework is the key to closing the opportunity gap, so much so that as a future curriculum leader of leaders, I believe it should be used as a professional development activity.

References

American Psychological Association. (2013). *Publication manual of the American Psychological Association* (6th ed.). Washington, DC: American Psychological Association.

Anderson, R. C., & Nagy, W. E. (1993). The vocabulary conundrum. *Center for the Study of Reading Technical Report, no. 570*. Washington, DC: Office of Educational Research and Improvement.

Baddeley, A. (2002). *Human memory: Theory and practice.* (Revised ed.). Hove, East Sussex: Psychology Press.

Baumann, J. F. (1991). Research on vocabulary instruction: Ode to Voltaire. In J. Flood, J. D. Lapp, & J. R. Squire (Eds.), *Handbook of research on teaching the English language arts* (pp. 604–632). New York, NY: Macmillan.

Becker, H. J. (1997). Parent involvement contracts in California's charter schools: Strategy for educational improvement or method of exclusion? *Teachers College Record*, *98*(3), 511–36.

Beers, M., Wilson, M., & Kearns, M. (2003). *Contructivist e-learning methodologies: A module development guide.* Burnaby, BC: Learning Resources Unit, British Columbia Institute of Technology.

Bruner, J. S. (1966). *Toward a theory of instruction* (Vol. 59). Cambridge, MA: Harvard University Press.

Bruner, J. S., Goodnow, J. J., & Austin, G. A. (1956). *A study of thinking.* New York, NY: Chapman & Hall.

Chien, C. W. (2015). Analysis the effectiveness of three online vocabulary flashcard websites on L2 learners' level of lexical knowledge. *English Language Teaching*, *8*(5), 111–121.

Creswell, J. (2016). *Qualitative inquiry and research design: Choosing among five traditions*, 2. SAGE Publications.

Creswell, J. W. (2012). Educational research. *Planning, conducting, and evaluating quantitative and qualitative research*.

Creswell, J. W. (2014). Research design: International student edition.

Creswell, J. W., & Clark, V. L. P. (2011.) *Designing and conducting mixed-methods research* (2nd ed.). Los Angeles, CA: SAGE.

Dana, N. F., & Yendol-Hoppey, D. (2014). *The reflective educator's guide to classroom research.* Thousand Oakes, CA: Corwin Press.

Dang, T. (2015). Web-based vocabulary learning with Quizlet. *TESL-EJ*, *19*(1), 1–8.

Dewey, J. (1933). *How we think: A restatement of the relation of reflective thinking to the educative process* (vol. 8). Carbondale, IL: Southern Illinois University Press

Driscoll, M. P. (2005). *Psychology of learning for onstruction.* Toronto, ON: Pearson.

Driscoll, M., & Van Barneveld, A. (2015). *Applying learning theory to mobile learning*. Alexandria, VA: American Society for Training and Development.

Ertmer, P. A., & Newby, T. J. (1993). Behaviorism, cognitivism, constructivism: Comparing critical features from an instructional design perspective. *Performance Improvement Quarterly*, *6*(4), 50–72.

Ertmer, P. A., & Newby, T. J. (1993). Behaviorism, cognitivism, constructivism: Comparing critical features from an instructional design perspective. *Performance Improvement Quarterly*, *6*(4), 50–72.

Goodman, J. (1984). Reflection and teacher education: A case study and theoretical analysis. *Interchange*, *15*(3), 9–26.

Grider, C. (1993). *Foundations of cognitive theory*. Retrieved from https://files.eric.ed.gov/fulltext/ED372324.pdf

Grillo, K. J. (2011, Summer). *An investigation of the effects of using digital flashcards to increase biology vocabulary knowledge in high school students with learning disabilities.* Retrieved from http://etd.fcla.edu/CF/CFE0003972/Grillo_Kelly_J_201108_PhD.pdf

Harmer, J. (2002). *How to teach vocabulary.* England: Longman.

Jackson III, D. B. (2015). A targeted role for L1 in L2 vocabulary acquisition with mobile learning technology. *Perspectives (TESOL Arabia)*, *23*(1), 6–11.

Mangen, A., & Velay, J. L. (2010). Digitizing literacy: Reflections on the haptics of writing. In M. H. Zadeh (Ed.), *Advances in haptics.* Available at http://www.intechopen.com/books/advances-in-haptics/digitizing-literacy-reflections-on-the-haptics-of-writing www.intechopen.com

Marzano, R. J., & Pickering, D. J. (2005). *Building academic vocabulary: Teacher's manual.* Alexandria, VA: Association for Supervision and Curriculum Development.

Marzano, R. J., & Pickering, D. J. (2005). *Building academic vocabulary: Teacher's manual*. Alexandria, VA: Association for Supervision and Curriculum Development.

Matthews, M. (1994). *Science teaching: The role of history and philosophy of science.* New York, NY: Rutledge Publisher.

Mergel, B. (1998). *Instructional design & learning theory* (Master's thesis, University of Saskatchewan). Retrieved From: *http://etad.usask.ca/802papers/mergel/brenda.htm.*

Mertler, C. A. (2014). *Action research: Improving schools and empowering educators.*

Mueller, P. A., & Oppenheimer, D. M. (2014). The pen is mightier than the keyboard: Advantages of longhand over laptop note taking. *Psychological Science*, *25*, 1159-1168. doi:0956797614524581.

Oxford, R., & Crookall, D. (1990). Vocabulary learning: A critical analysis of techniques. *TESL Canada Journal*, *7*(2), 09-30.

Piaget, J., & Cook, M. T. (1952). *The origins of intelligence in children*. New York, NY: W. W. Norton & Co.

Prensky, M. (2001, October). *Digital natives, digital immigrants.* Retrieved from http://www.marcprensky.com/writing/Prensky - Digital Natives, Digital Immigrants - Part1.pdf

Puentedura, R. (2012). *SAMR: Guiding development.* Retrieved from http://www.hippasus.com/rrpweblog/archives/2012/01/19/SAMR_GuidingDevelopment.pdf

Puentedura, R. R. (2014). SAMR and TPCK: A hands-on approach to classroom practice. *Hipassus*. Retrieved from

http://www.hippasus.com/rrpweblog/archives/2012/09/03/BuildingUponSA M R. pdf.

Quizlet. (2014). *About Quizlet.* Retrieved from http://quizlet.com

Rumelhart, D. E., & Norman, D. A. (1976). *Accretion, tuning and restructuring: Three modes of learning* (No. 7602). San Diego, CA: La Jolla Center for Human Information Processing.

Schoology. (2016). *#1 K–12 learning management system.* Retrieved from https://www.schoology.com/k-12

Segal, J. W., Chipman, S. F., & Glaser, R. (2014). *Thinking and learning skills: Volume 1: relating instruction to research*. Routledge.

Stanovich, K. E., Nathan, R. G., & Vala-Rossi, M. (1986). Developmental changes in the cognitive correlates of reading ability and the developmental lag hypothesis. *Reading Research Quarterly*, *21*(3), 267–283.

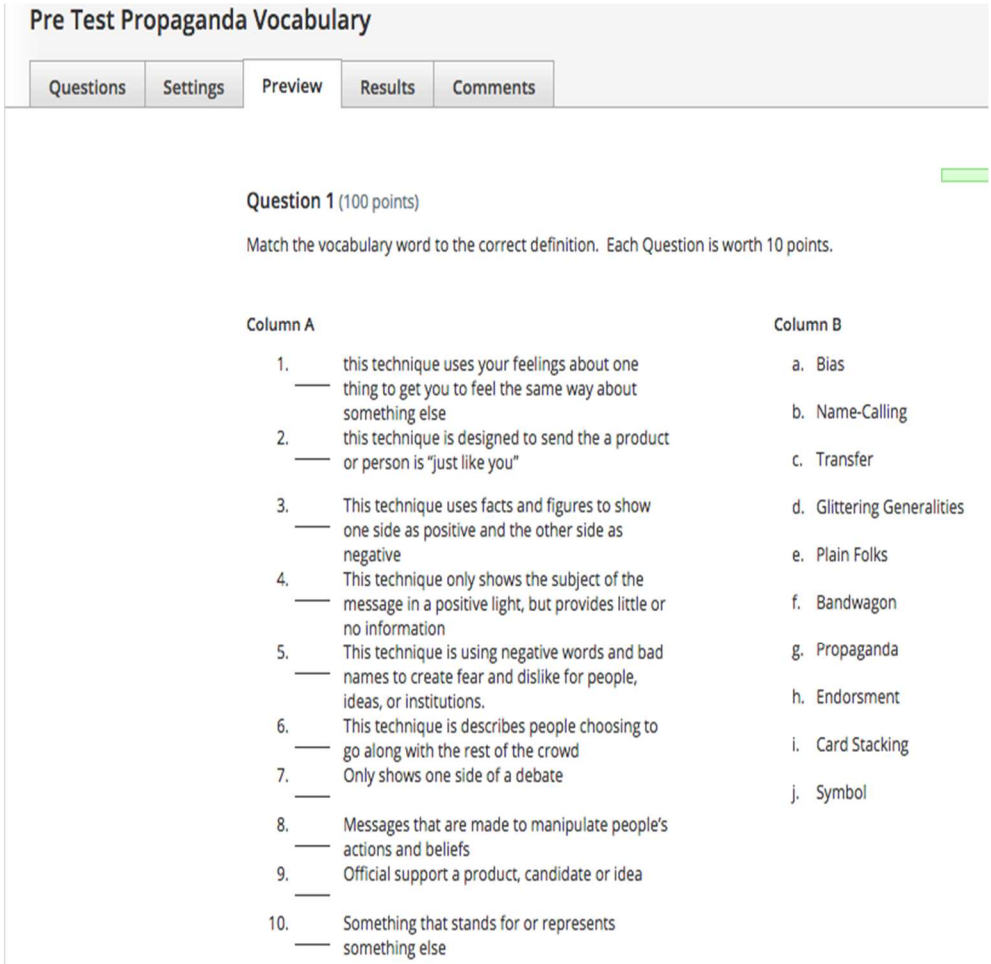
The University of Stavanger. (2011, January 24). Better learning through handwriting. *ScienceDaily*. Retrieved from www.sciencedaily.com/releases/2011/01/110119095458.htm

Thornbury, S. (2002). Using dictionaries. *How to teach vocabulary.* Harlow: Pearson Education.

Trochim, W. (2006). Web center for social research methods. Retrieved from http://www.socialresearchmethods.net/kb/

Vygotsky, L. (1978). Interaction between learning and development. *Readings on the Development of Children*, *23*(3), 34–41.

Appendix A: Student Propaganda Summative Pretest



Pre Test Propaganda Vocabulary

Questions | Settings | Preview | Results | Comments

Question 1 (100 points)

Match the vocabulary word to the correct definition. Each Question is worth 10 points.

Column A		Column B
1. ____	this technique uses your feelings about one thing to get you to feel the same way about something else	a. Bias
2. ____	this technique is designed to send the a product or person is "just like you"	b. Name-Calling
3. ____	This technique uses facts and figures to show one side as positive and the other side as negative	c. Transfer
4. ____	This technique only shows the subject of the message in a positive light, but provides little or no information	d. Glittering Generalities
5. ____	This technique is using negative words and bad names to create fear and dislike for people, ideas, or institutions.	e. Plain Folks
6. ____	This technique is describes people choosing to go along with the rest of the crowd	f. Bandwagon
7. ____	Only shows one side of a debate	g. Propaganda
8. ____	Messages that are made to manipulate people's actions and beliefs	h. Endorsment
9. ____	Official support a product, candidate or idea	i. Card Stacking
10. ____	Something that stands for or represents something else	j. Symbol

Appendix B: Random Student Document Propaganda Flashcards

Quizlet

Propaganda

13 terms

Sometimes Missed Students get these terms right **25%-75%** of the time

73%	Glittering Generalities	is an emotionally appealing phrase so closely associated with highly valued concepts and beliefs that it carries conviction without supporting information or reason. using words that sound good but don't have a definite meaning 	☆

Rarely Missed Students get these terms right **75%-100%** of the time

93%	Propaganda	information, especially of a biased or misleading nature, used to promote or publicize a particular political cause or point of view. Media that uses carefully crafted messages to manipulate people's actions and beliefs information that is spread for the purpose of promoting some cause 	☆
93%	Symbol	a mark or character used as a conventional	☆

		representation of an object, function, or process, e.g., the letter or letters standing for a chemical element or a character in musical notation. anything that stands for or represents something else 	
93%	Bias	prejudice in favor of or against one thing, person, or group compared with another, usually in a way considered to be unfair. Pre judge someone that you don't know. 	☆
93%	Bandwagon	a particular activity or cause that has suddenly become fashionable or popular. a popular trend that attracts growing support. Always wanting to be on the winning team 	☆
93%	Testimonials	a formal statement testifying to someone's character and qualifications. Statements written by satisfied users of a	☆

Appendix C: Student Perceptions of Quizlet

1. Do you currently have a personal Quizlet account?

2. Do you currently have the Quizlet application downloaded on your phone?

3. Do you currently use Quizlet in another class?

4. In how many classes do you use Quizlet?

5. How many times do you use Quizlet per week?

6. When your teacher asks you to use Quizlet
    a. You do so willingly
    b. You use it without being asked
    c. You use written flashcards or an alternate study method

7. Which functions or games in Quizlet do you use the most? Check as many as apply.
    a. Live
    b. Learn
    c. Gravity
    d. Flashcards
    e. Match
    f. Write
    g. Spell
    h. Test

8. Do you feel that Quizlet helps you be more successful with formative assessments?

9. Do you feel like Quizlet helps you be more successful on summative assessments?

10. Do feel that using Quizlet is easy or difficult to use?

Appendix D: Student Perception of Quizlet Post Survey

1. Many of you reported doing well after using Quizlet Live in core classes. Why do you think this true?
    a. because using Quizlet Live was a formative grade
    b. because the teacher made the Quizlet Live for all of the students
    c. because the questions in Quizlet Live were very similar to the questions on the test

2. How important do you think learning vocabulary is to doing well on end of year course testing and standardized testing, like SCPASS and SCREADY

0 10

3. When learning vocabulary do you learn better is the vocabulary is presented
    a. at the beginning
    b. at the end
    c. as a whole part of the less, as you go along

4. When creating your own flashcards for the Propaganda Lesson did you
    a. copy and paste your definitions
    b. write the definitions in your own words
    c. typed the definition from a memory

5. At what point did you download Quizlet to you Ipad?
    a. before this unit in another class
    b. when instructed to do so by the teacher
    c. when you wanted to study at home but did not have internet availability

6. After the teacher share with you what the summative would look like, how did you change your flashcards?
    a. I did not change them I just continued to study what I had.
    b. I added pictures and examples because that is what the summative looked like.
    c. I added pictures and examples but I did not understand the examples.

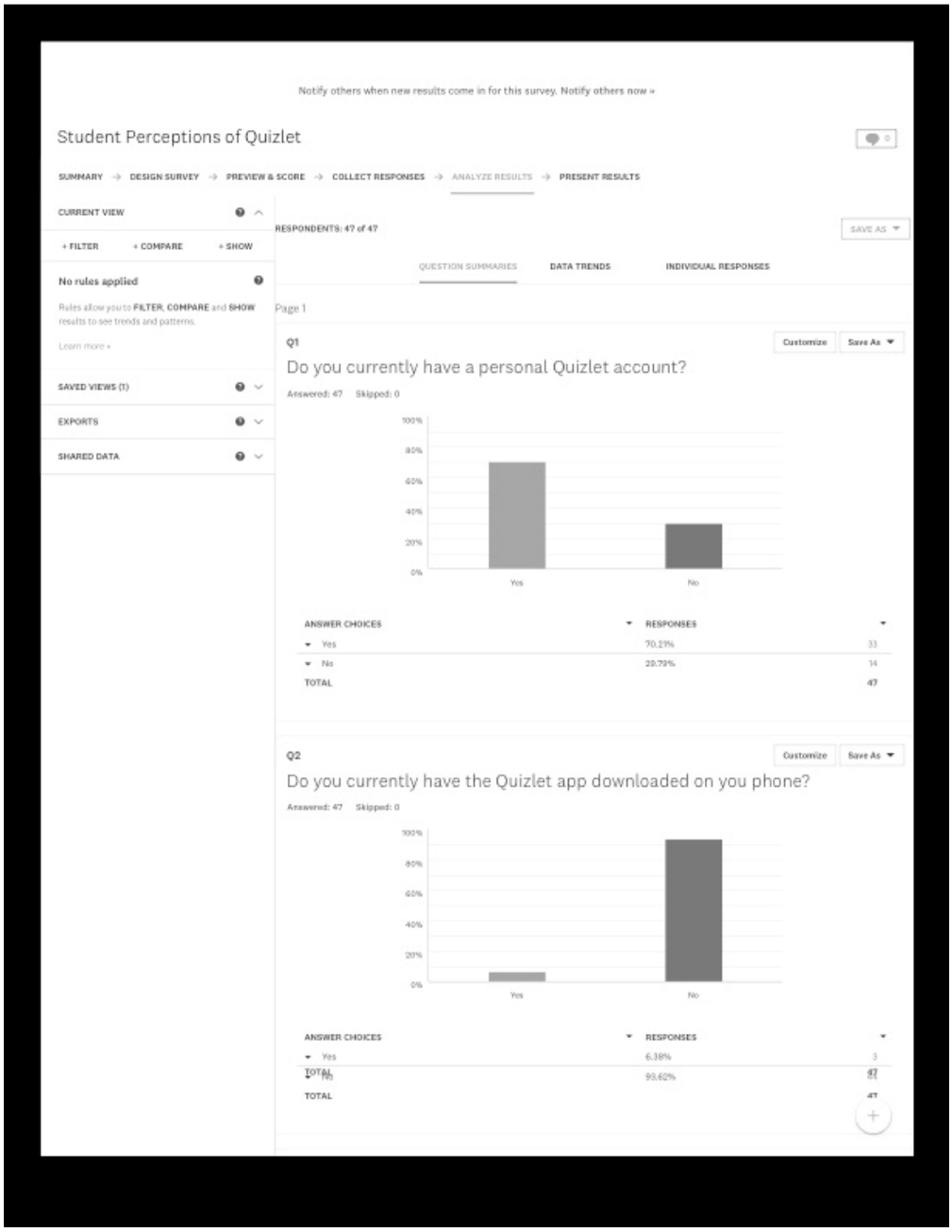
7. Which Quizlet game/function do you use most often?
    a. Fashcard
    b. Match
    c. Test
    d. Gravity
    e. Write
    f. Spell
    g. Quizlet Live

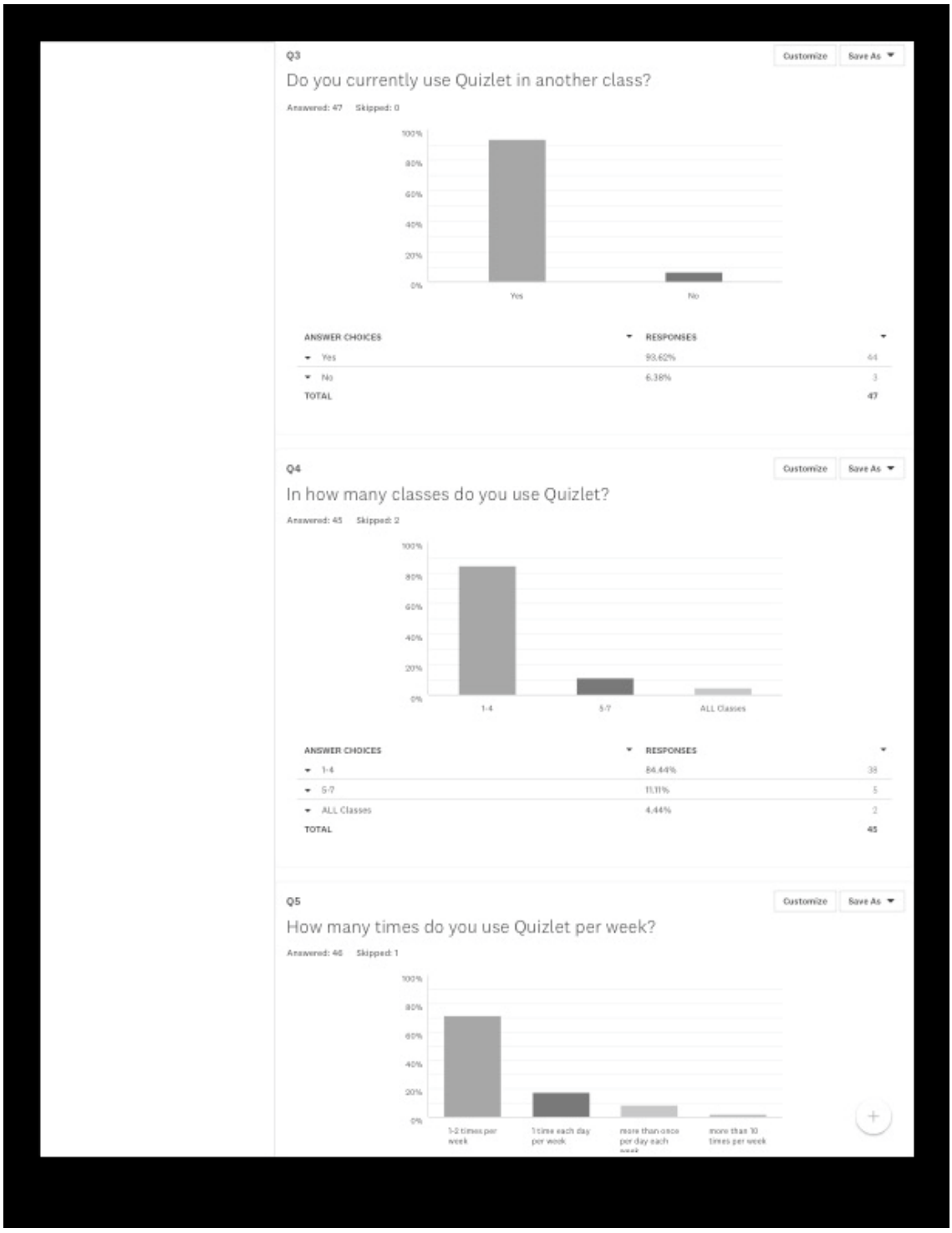
8. Did you download the Quizlet application to your person cell phone? Why or Why not?
    a. Yes, because I wanted to be able to study at any time I had access to my phone.
    b. No, because I did not have room on my phone.
    c. No, because I did not want to put and educational application on my personal phone.
    d. No, because I did not realize it was free.

9. After creating your own Quizlet Live in your groups do you think this helped you pass the summative?
    a. Yes
    b. No

10. Did you feel if you had used written flashcards to study instead of Quizlet you would have done better on the summative or post-test?

Appendix E: Student Perception of Quizlet Survey Results




Q3
Customize
Save As
Do you currently use Quizlet in another class?
Answered: 47 Skipped: 0
100%
80%
60%
40%
20%
0%
Yes
No
ANSWER CHOICES
RESPONSES
Yes
93.62%
44
No
6.38%
3
TOTAL
47
Q4
Customize
Save As
In how many classes do you use Quizlet?
Answered: 45 Skipped: 2
100%
80%
60%
40%
20%
0%
1-4
5-7
ALL Classes
ANSWER CHOICES
RESPONSES
1-4
84.44%
38
5-7
11.11%
5
ALL Classes
4.44%
2
TOTAL
45
Q5
Customize
Save As
How many times do you use Quizlet per week?
Answered: 46 Skipped: 1
100%
80%
60%
40%
20%
0%
1-2 times per week
1 time each day per week
more than once per day each
more than 10 times per week

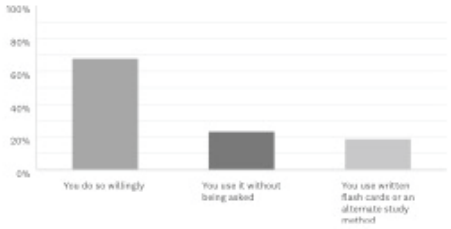
ANSWER CHOICES	RESPONSES	
1-2 times per week	71.74%	33
1 time each day per week	17.39%	8
more than once per day each week	8.70%	4
more than 10 times per week	2.17%	1
TOTAL		46

Q6

Customize Save As

When your teacher asks you to use Quizlet

Answered: 47 Skipped: 0



ANSWER CHOICES	RESPONSES	
You do so willingly	68.09%	32
You use it without being asked	23.40%	11
You use written flash cards or an alternate study method	19.15%	9

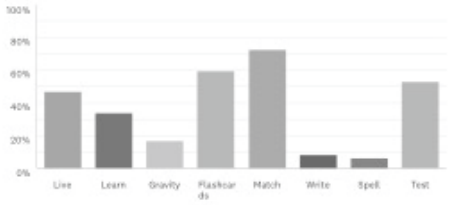
Total Respondents: 47

Q7

Customize Save As

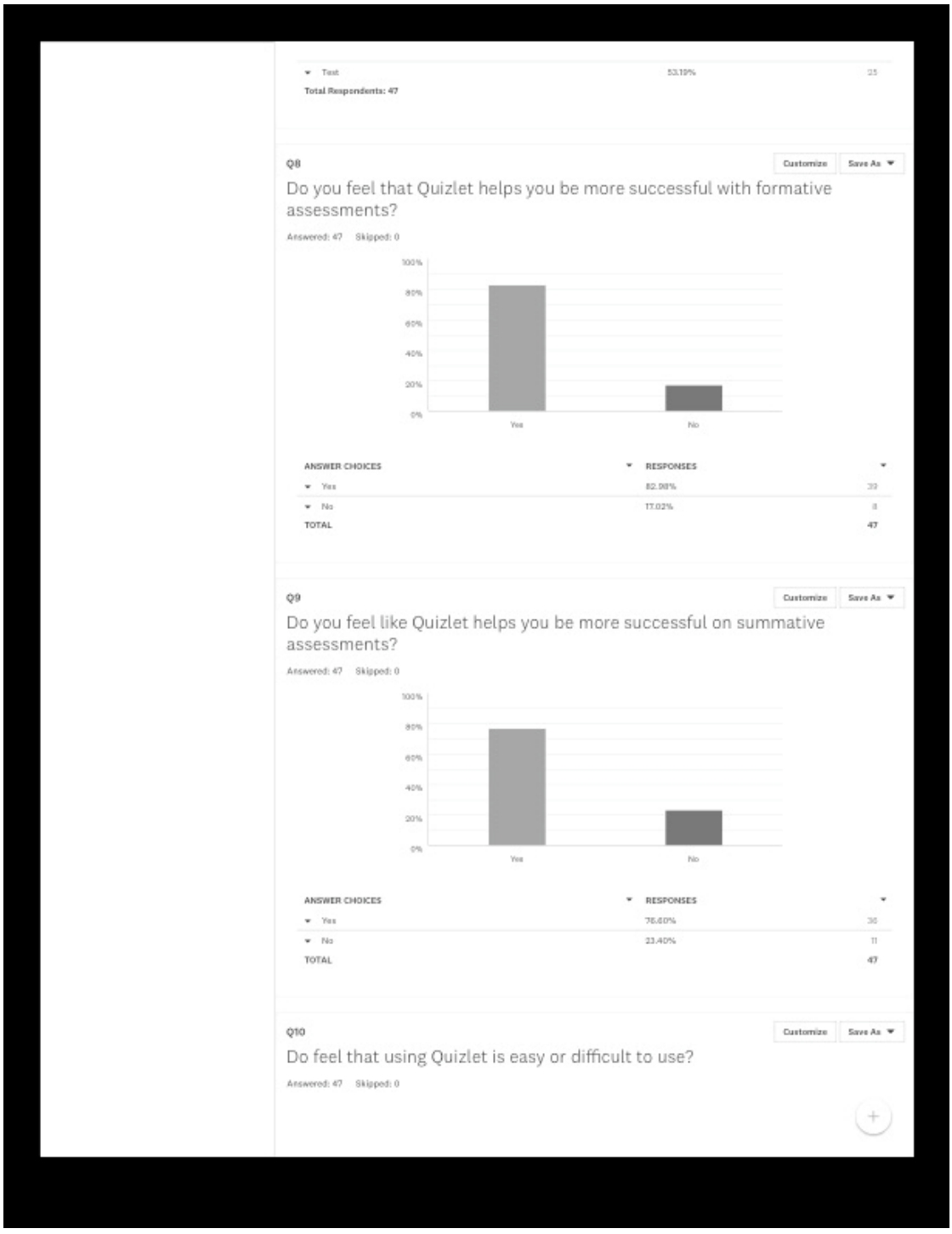
Which functions or games in Quizlet do you use the most? Check as many as apply.

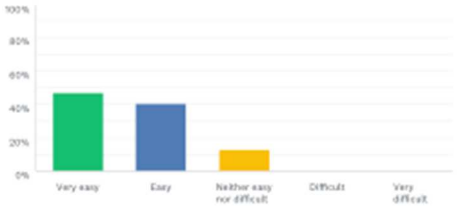
Answered: 47 Skipped: 0



ANSWER CHOICES	RESPONSES	
Live	46.81%	22
Learn	34.04%	16
Gravity	17.02%	8
Flashcards	59.57%	28
Match	72.34%	34
Write	8.51%	
Spell	6.38%	

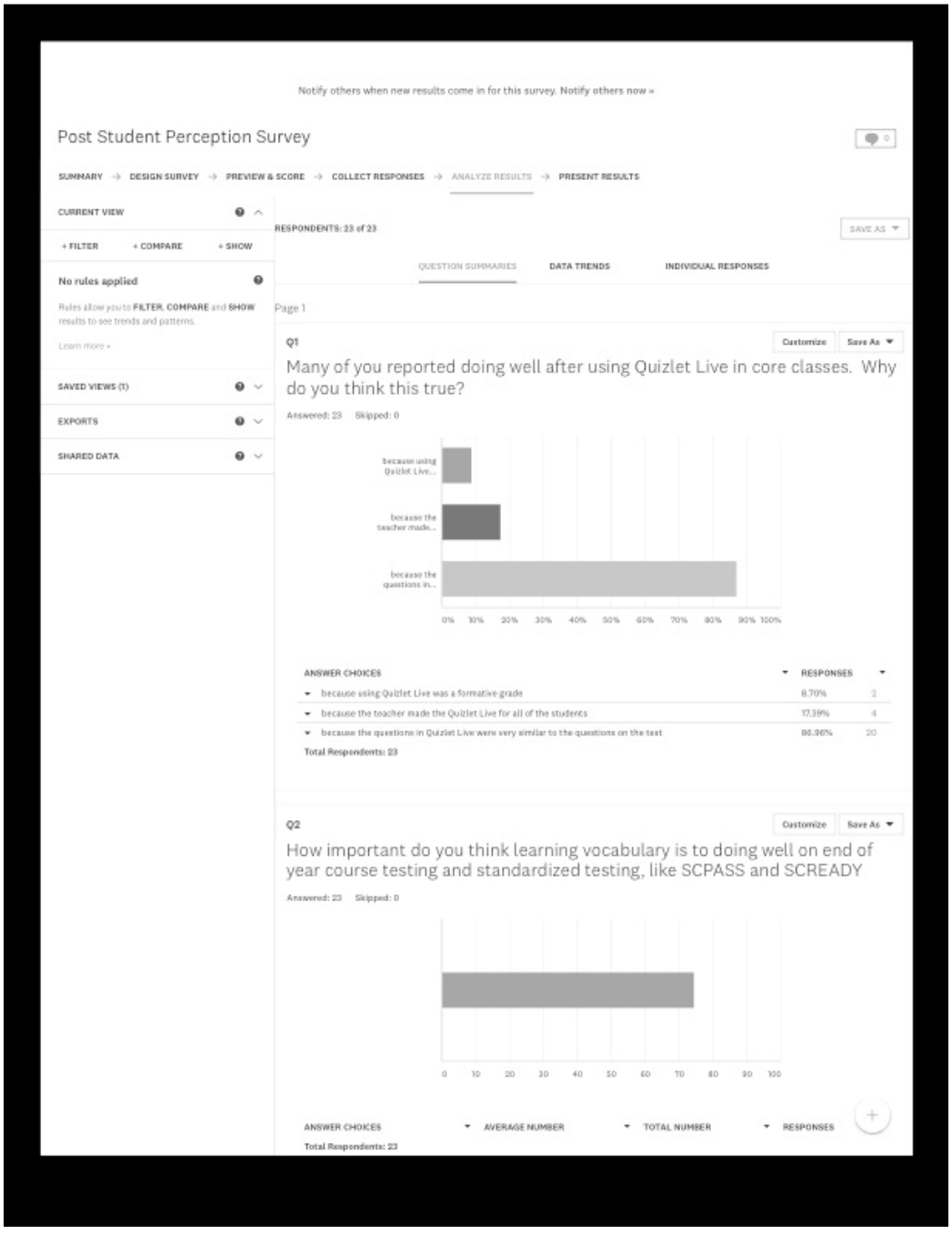
Total Respondents: 47

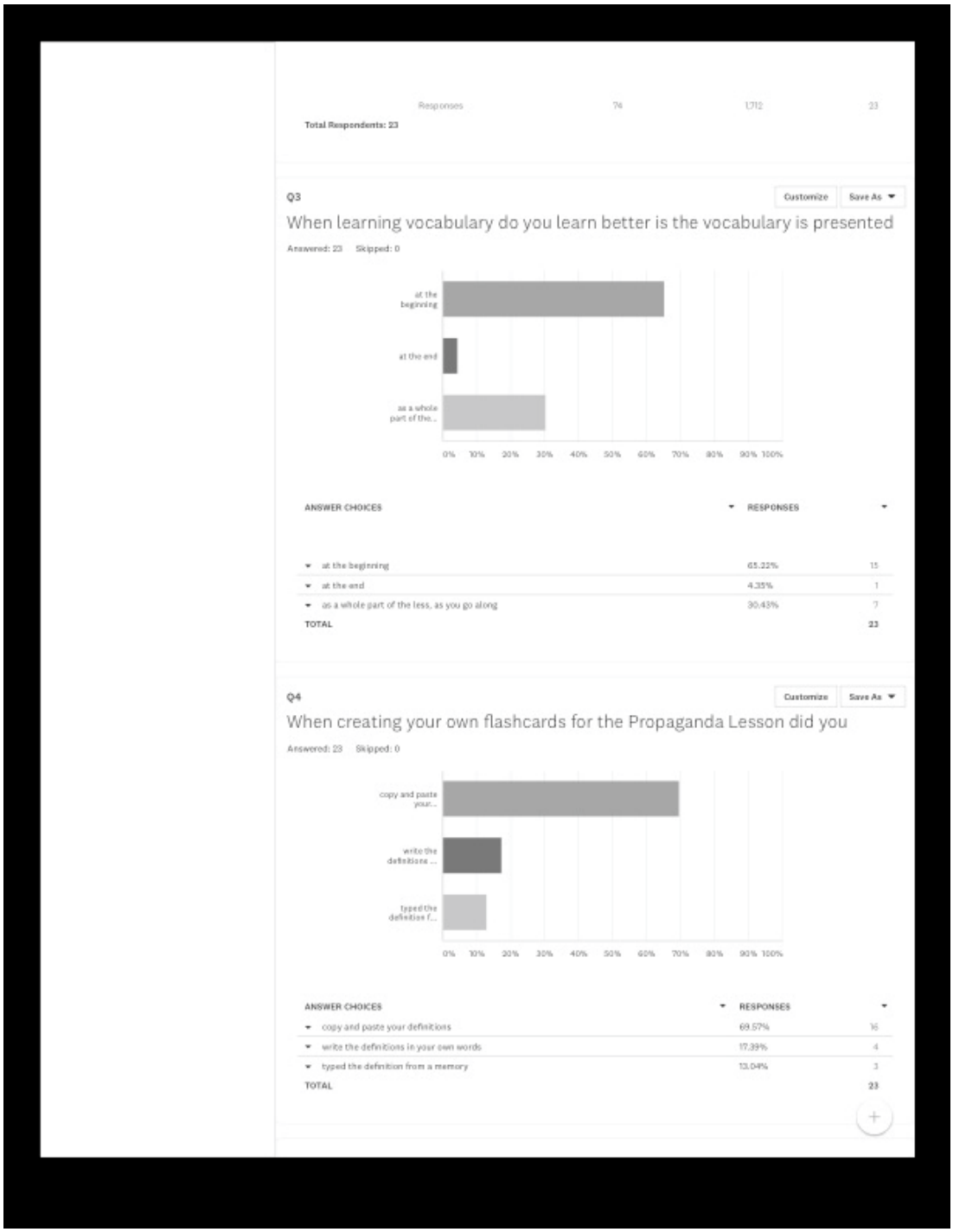

Text 53.19% 25
Total Respondents: 47
Q8
Customize
Save As
Do you feel that Quizlet helps you be more successful with formative assessments?
Answered: 47 Skipped: 0
100%
80%
60%
40%
20%
0%
Yes
No
ANSWER CHOICES
RESPONSES
Yes 82.98% 39
No 17.02% 8
TOTAL 47
Q9
Customize
Save As
Do you feel like Quizlet helps you be more successful on summative assessments?
Answered: 47 Skipped: 0
100%
80%
60%
40%
20%
0%
Yes
No
ANSWER CHOICES
RESPONSES
Yes 76.60% 36
No 23.40% 11
TOTAL 47
Q10
Customize
Save As
Do feel that using Quizlet is easy or difficult to use?
Answered: 47 Skipped: 0



ANSWER CHOICES	RESPONSES	
Very easy	46.81%	22
Easy	40.43%	19
Neither easy nor difficult	12.77%	6
Difficult	0.00%	0
Very difficult	0.00%	0
TOTAL		47

Appendix F: Student Perception of Quizlet Post Survey Results



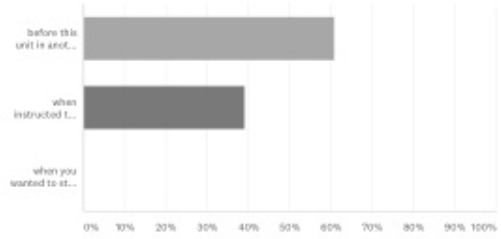

Responses 74 1,712 23
Total Respondents: 23
Q3
Customize
Save As
When learning vocabulary do you learn better is the vocabulary is presented
Answered: 23 Skipped: 0
at the beginning
at the end
as a whole part of the...
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
ANSWER CHOICES
RESPONSES
at the beginning 65.22% 15
at the end 4.35% 1
as a whole part of the less, as you go along 30.43% 7
TOTAL 23
Q4
Customize
Save As
When creating your own flashcards for the Propaganda Lesson did you
Answered: 23 Skipped: 0
copy and paste your...
write the definitions ...
typed the definition f...
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
ANSWER CHOICES
RESPONSES
copy and paste your definitions 69.57% 16
write the definitions in your own words 17.39% 4
typed the definition from a memory 13.04% 3
TOTAL 23

Q5

Customize Save As

At what point did you download Quizlet to you Ipad?

Answered: 23 Skipped: 0



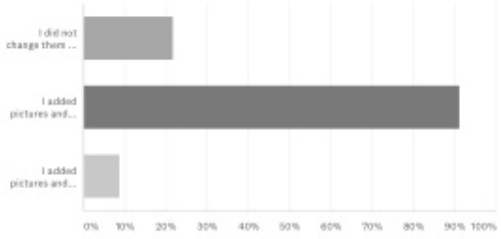
ANSWER CHOICES	RESPONSES	
before this unit in another class	60.87%	14
when instructed to do so by the teacher	39.13%	9
when you wanted to study at home but did not have internet availability	0.00%	0
TOTAL		23

Q6

Customize Save As

After the teacher share with you what the summative would look like, how did you change your flashcards?

Answered: 23 Skipped: 0



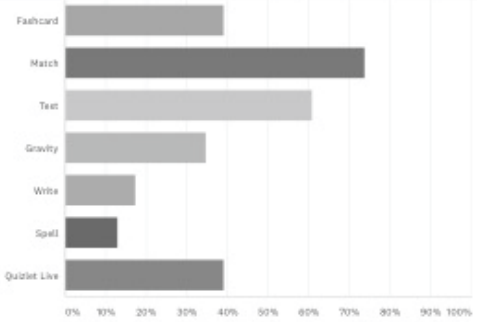
ANSWER CHOICES	RESPONSES	
I did not change them I just continued to study what I had.	21.74%	5
I added pictures and examples because that is what the summative looked like.	91.30%	21
I added pictures and examples but I did not understand the examples.	8.70%	2
Total Respondents: 23		

Q7

Customize Save As

Which Quizlet game/function do you use most often?

Answered: 23 Skipped: 0



ANSWER CHOICES	RESPONSES	
Fashcard	39.13%	9
Match	73.91%	17
Test	60.87%	14
Gravity	34.78%	8
Write	17.39%	4
Spell	13.04%	3
Quizlet Live	39.13%	9

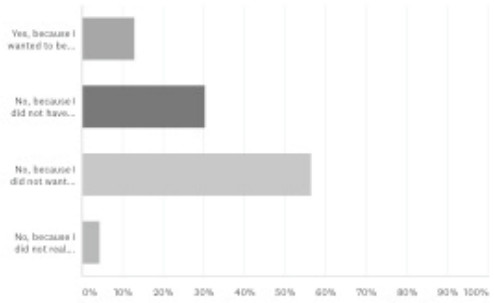
Total Respondents: 23

Q8

Customize Save As

Did you download the Quizlet app to your person cell phone? Why or Why not?

Answered: 23 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes, because I wanted to be able to study at any time I had access to my phone.	13.04%	3
No, because I did not have room on my phone.	30.43%	7
No, because I did not want to put and educational app on my personal phone.	56.52%	13
No, because I did not realize it was free.	4.35%	1

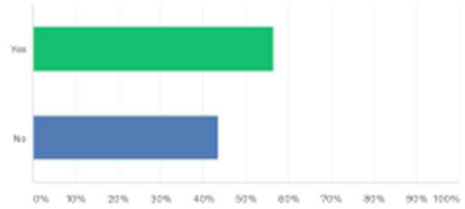
Total Respondents: 23

Q9

Customize Save As

After creating your own Quizlet Live in your groups do you think this helped you pass the summative?

Answered: 23 Skipped: 0



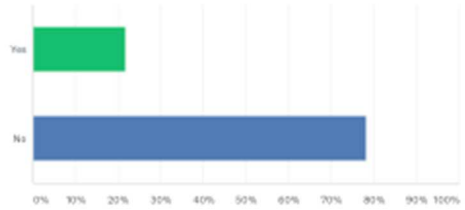
ANSWER CHOICES	RESPONSES	
Yes	56.52%	13
No	43.48%	10
Total Respondents: 23		

Q10

Customize Save As

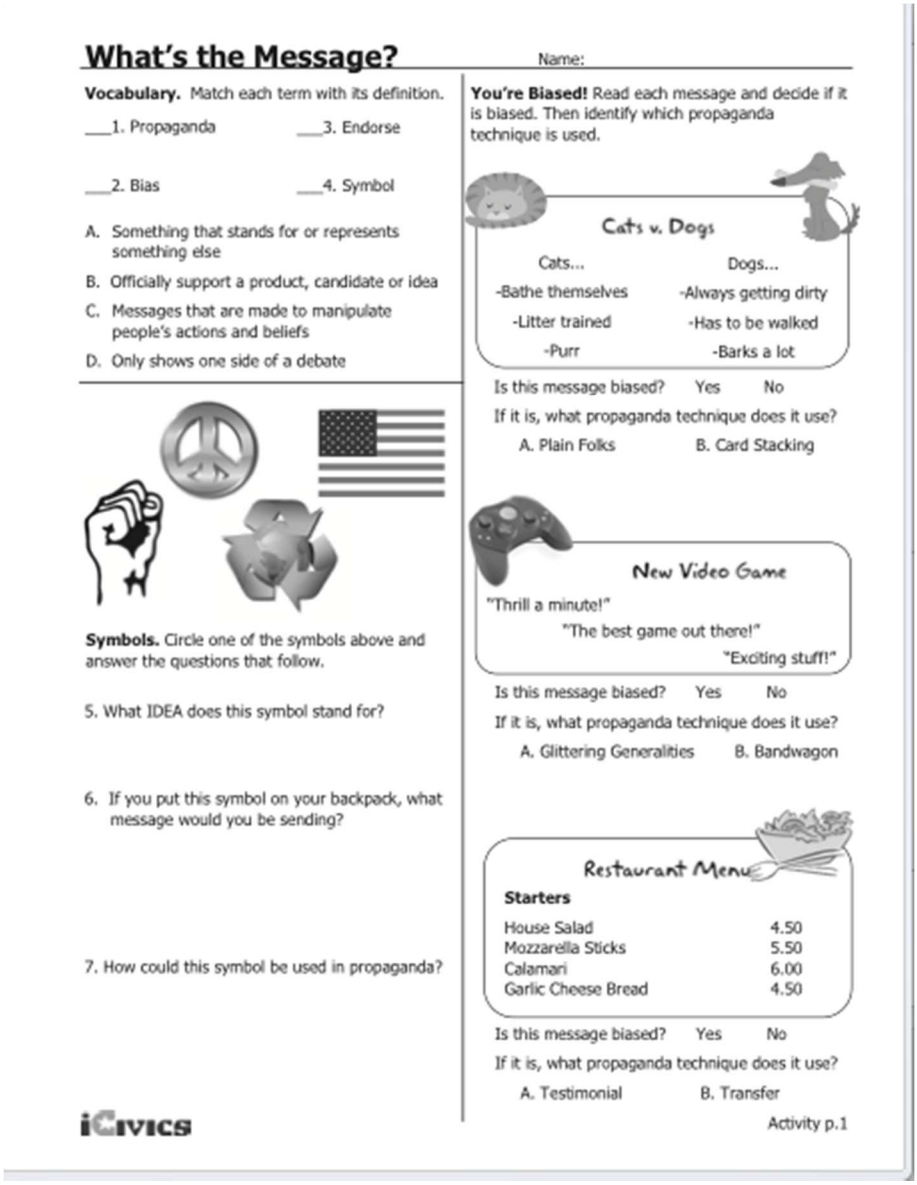
Did you feel if you had used written flashcards to study instead of Quizlet you would have done better on the summative or post-test.

Answered: 23 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	21.74%	5
No	78.26%	18
TOTAL		23

Appendix G: Pen-and-Paper Formative Assessment



What's the Message? Name:

Vocabulary. Match each term with its definition.

___1. Propaganda ___3. Endorse

___2. Bias ___4. Symbol

A. Something that stands for or represents something else

B. Officially support a product, candidate or idea

C. Messages that are made to manipulate people's actions and beliefs

D. Only shows one side of a debate

Symbols. Circle one of the symbols above and answer the questions that follow.

5. What IDEA does this symbol stand for?

6. If you put this symbol on your backpack, what message would you be sending?

7. How could this symbol be used in propaganda?

You're Biased! Read each message and decide if it is biased. Then identify which propaganda technique is used.

Cats v. Dogs

Cats...	Dogs...
-Bathe themselves	-Always getting dirty
-Litter trained	-Has to be walked
-Purr	-Barks a lot

Is this message biased? Yes No

If it is, what propaganda technique does it use?

A. Plain Folks B. Card Stacking

New Video Game

"Thrill a minute!"

"The best game out there!"

"Exciting stuff!"

Is this message biased? Yes No

If it is, what propaganda technique does it use?

A. Glittering Generalities B. Bandwagon

Restaurant Menu

Starters

House Salad	4.50
Mozzarella Sticks	5.50
Calamari	6.00
Garlic Cheese Bread	4.50

Is this message biased? Yes No

If it is, what propaganda technique does it use?

A. Testimonial B. Transfer

iCivics

Activity p.1

Appendix H: Informational Text

What's the Message?

Name:

Propaganda

Did you know the average teen is exposed to over 3,000 advertisements per day? Without the skills to look critically at all these messages, it's easy to be persuaded by them without even realizing it. **Propaganda** is media that uses carefully-crafted messages to manipulate people's actions and beliefs. It has one purpose, and one purpose only: to persuade you. There are a variety of propaganda techniques. They use **biased**, or one-sided, messages and are designed to appeal to peoples' emotions instead of their judgment and reasoning. How many of the following techniques do you recognize from your own exposure to propaganda?

Oprah Winfrey and Barack Obama in 2008.

Testimonials

Testimonials usually involve celebrities or other respected people **endorsing**, or officially supporting, a product or idea. The person giving the testimonial could be famous, knowledgeable about the product (such as a doctor talking about medicine), or just an ordinary person who claims the product has worked for them. When the testimonial comes from a celebrity, the hope is that you will want to use the product or support the idea simply because they do. Other testimonials try to persuade you to use or support something because it is good for you or it worked for others. Beware, though, because people are usually paid to give endorsements (except in politics).

Ask yourself: Who is quoted in the testimonial? Is this person actually an expert about this product or idea? Does the product or idea have value without the testimony or endorsement?

Bandwagon

"Jumping on the bandwagon" describes people choosing to go along with the rest of the crowd. **Bandwagon** propaganda creates the impression that there is widespread support for a thing or idea. People tend to want to be on the winning team and try to avoid being the odd one out. These messages create a sense of peer pressure to join in.

Ask yourself: Does the message provide reasons for joining the group? Is there any evidence for or against joining in?

It must be good if billions have been served!

A 2008 political cartoon showing the presidential candidates too young or too old.

Name-Calling

Name-calling is exactly what it sounds like: using negative words and bad names to create fear and dislike for people, ideas, or institutions. Name-calling can be verbal or visual. When done visually, it shows a person or thing in an unflattering way. You can find both kinds of this technique in political cartoons, political attack ads, and on news talk shows.

Ask yourself: Who is being called what? Is there a real connection between the names and the person/idea being attacked?

What's the Message?

Name: _____

Glittering Generalities

This technique always shows the subject of the message in a positive light, but provides little or no information. **Glittering generalities** use simple, clever slogans that appeal to peoples' emotions. These general statements are easy to remember but hard to verify because they offer no facts.

Ask yourself: What do these slogans or catchphrases really mean?

Slogans and posters from the 2008 presidential election.

Card Stacking

Card stacking uses facts and figures to show one side as positive and the other side as negative. The message shows only positive information about the person, product, or idea being promoted, and it shows only damaging information about the opposition or competition. This technique is designed to make you think you are hearing both sides. In reality, you are actually hearing only one perspective.

Ask yourself: Are facts being changed or left out? What other pieces of information do I need to make an informed decision?

Plain Folks

The **plain folks** technique is designed to send the message that a product or person is "just like you." An advertiser will show an ordinary-looking person who vouches for how well a product works. Politicians have their picture taken visiting coffee shops, riding on tractors, and doing other things that everyday people do. The goal is to gain your trust by showing that people just like you use the product or support the person.

Ask yourself: Can I trust the person who is speaking or acting? What are the person's motives for visiting this place? Is this person really just like me?

Rudy Giuliani visits a small town diner during his 2007 presidential campaign.

Transfer

The **transfer** technique uses your feelings about one thing to get you to feel the same way about something else. Transfer can use a positive image to persuade you to like something or a negative image to persuade you to dislike something. The images might be **symbolic**, such as a flag standing for patriotism. They might be cute and lovable, such as a baby penguin. The images could be repulsive, such as diseased skin in an anti-smoking campaign, or they could be hateful, such as comparing a politician to Adolf Hitler. However they are presented, the images act as wordless messages that most people can identify with.

Ask yourself: What is the image trying to get me to feel? Is there an actual connection between the image and the person or product?

Appendix I: Pen-and-Paper Summative Test

What's the Message?

Name: _____

Station One: Name Calling

Image 1. Explain how the drawing portrays German soldiers:

Does the soldier look human?	❑ Yes ❑ No, he looks like:
What is on the soldier's arms?	
What is the soldier trying to do?	
Is this a positive or negative image?	❑ Positive ❑ Negative

Image 2. What name does this ad want you to connect with the politician?

_____

A) The ad is saying that Patty Murray is _____.

B) The ad shows Patty Murray as

❑ happy ❑ unhappy.

C) The advertiser wants people to

❑ like ❑ dislike this politician.

The Technique. Based on what you see in these examples, what three things can be done to make someone or something look bad?

1. _____
2. _____
3. _____

Station Two: Testimonial

Image 1. Explain the message in this magazine ad:

Who is the celebrity in this ad?	
What product is she endorsing?	
What does she claim this product has done?	
What message are YOU supposed to take away from this ad?	

Image 2. Analyze the testimonial in this ad:

A) Who is endorsing whom in this ad?

_____ is endorsing _____

B) The testimonial is being given by:

- ❑ A celebrity
- ❑ Knowledgeable group of people
- ❑ An ordinary person

C) What is the ad trying to persuade you to do?

_____

The Technique. Which of the following testimonials would convince YOU?

A football quarterback endorsing toothpaste.

A mom endorsing a healthy snack for kids.

Your favorite movie star endorsing broccoli.

Your favorite singer endorsing a brand of shoes.

What's the Message?

Name: _____

Station Three: Transfer

Image 1. Explain the message in this public service announcement:

What two things are pictured in this image?	1) 2)
Which one is supposed to be scary?	
How does the scary image impact the other image?	
What is this ad trying to tell you?	

Image 2. Setting the stage:

A) What are the 2 symbols of patriotism you see in this image?

1. _____

2. _____

B) What are these symbols supposed to make you believe about the candidate?

- ❑ He is from New York.
- ❑ His favorite color is red.
- ❑ He loves America.

The Technique. Think about whether the transfer messages in these images are accurate:

A) Is there an actual connection between car wrecks and alcoholic beverages?

❑ Yes ❑ No ❑ Need more information to decide

B) Is there an actual connection between this politician and the symbols in the picture?

❑ Yes ❑ No ❑ Need more information to decide

Station Four: Glittering Generalities

Image 1. Explain the message in this soda ad:

What does this ad tell you about Coca-Cola?	
How much information is provided in the ad?	❑ A lot ❑ Some ❑ A little ❑ None
How much do you already know about Coca-Cola ?	❑ A lot ❑ Some ❑ A little ❑ None
How is this message supposed to make you feel?	❑ Positive ❑ Neutral ❑ Negative

Image 2. Match each question below with the piece of campaign propaganda that it challenges.

_____ What specific leadership qualifications does he have?

_____ What does this future hold?

_____ What, specifically, should Americans hope for?

_____ What, exactly, can we do?

_____ Why should I like him?

_____ Can anyone really guarantee peace and prosperity?

The Technique. Describe how glittering generalities tries to persuade people. What tools does it use? Unscramble the words below.

lgsnosa _____

and

cthca esrhasp _____

that are

ispmel & revcel _____

What's the Message?

Name: _____

Station Five: Plain Folks

Image 1. "Plain" President?

A) Do you think this is where the President and Vice President usually eat?

❑ Yes ❑ No

B) Find one detail in this picture that makes it look like the kind of place everyday people might eat:

_____

Image 2. Campaigning with workers.

A) What message is this photo trying to send?

- ❑ Perry wishes he could wear a hard hat too
- ❑ Perry wants to invest in this company
- ❑ Perry can relate to average people

B) Find one thing in this picture that shows these workers are "plain folks":

_____

C) The politicians in both images still look different from everyone else because they are wearing

_____.

Image 3. Explain the message in this ad:

A) The woman in the ad looks

❑ glamorous ❑ normal

B) Find one detail in this picture that makes the woman look like a regular person:

_____

The Technique. Mark the question that would NOT be helpful for analyzing this technique.

- ❑ Would the President eat here if there were no cameras photographing him?
- ❑ Why is Perry visiting these workers?
- ❑ Is the woman with the water a Republican?

Station Six: Bandwagon

Image 1. Explain the message in this ad for laundry detergent:

What difference do you see between the teams?	
What is Tide's slogan?	
Which team are you supposed to prefer?	❑ #2 Brand ❑ Tide
Why are you supposed to want to be on that team?	

Image 2. Analyze this World War II poster:

A) When Rosie says "we," who is she talking to?

- ❑ All Americans
- ❑ American women
- ❑ Factory workers

B) Look at Rosie. Find one characteristic or quality Rosie has that other women might wish for:

_____

The Technique. The bandwagon technique is most like:

- ❑ Peer pressure
- ❑ Advice
- ❑ Getting in trouble

Why? _____

_____

_____

What's the Message?

Name:

Station Seven: Card Stacking

Image 1. Explain the message about this cell phone provider ad:

What can you learn about Verizon?	
What do you learn about AT&T?	
Can you tell whether AT&T has any benefits Verizon doesn't have?	❑ Yes ❑ No
Why can't you trust the information in this ad?	

Image 2.

A) Which product is this ad promoting?

- ❑ Omega-9 Canola Oil
- ❑ Partially Hydrogenated Soybean Oil

B) The ad mentions reducing "Bad Fat." Is it clear what "bad fat" is?

❑ Yes ❑ No

C) Does this ad show any information about the possible benefits of soybean oil?

❑ Yes ❑ No

The Technique. Think about whether you can base a decision on these messages:

Do card stacking messages give you information?

❑ Yes ❑ No

Do they give you the benefits and drawbacks of both items being compared?

❑ Yes ❑ No

Do they give you enough information to really understand both products?

❑ Yes ❑ No

Station Eight: Challenge Image

Romney/Rock Image. Explain the message in this photo op:

Who is endorsing whom in this photograph?	is endorsing →	
What is hanging in the background?		
Which group of people would most likely be persuaded by this image? (check all that apply)	❑ Senior citizens ❑ Kids under 18 ❑ Rock music lovers ❑ Jazz music fans ❑ Voters age 18-40 ❑ Men ❑ Women	
Which **two** propaganda techniques are applied in this scene?	Technique #1	Technique #2
How do you know these techniques are being used?		

Appendix J: Quizlet Use Frequency Data

Student	Learn	Flashcards	Write	Spell	Test	Match	Gravity
1.	*	*				*	
2.	*	*	*	*	*	*	*
3.	No set						
4.	public						
5.	No set						
6.	*	*				*	*
7.	*	*				*	*
8.		*			*	*	*
9.	*		*	*	*	*	
10.		*			*	*	*
11.	public						
12.						*	
13.	*				*	*	
14.	No set						
15.	*		*	*	*	*	*
16.	*	*	*	*	*	*	*
17.	No set						
18.		*					

19.	*					*	
20.	public						
21.	No set						
22.	No set						
23.	No set						
24.		*				*	
25.	*	*	*	*	*	*	
26.	*		*		*	*	
27.	*	*	*		*	*	
28.	*	*	*		*	*	
29.	*	*			*	*	
30.	No set						
31.	*	*	*			*	
32.	No set						
33.	No set						
34.	*	*	*	*	*	*	*
35.	*	*				*	*
36.	*	*			*	*	*
37.					*	*	
38.	public						
39.	public						
40.	public						
41.	No set						
42.						*	

43.	No set						
44.	*	*			*	*	*
45.	public						
46.	*	*	*	*			
47.	*				*	*	*
48.	No set						

Twenty (20) students used 4 or more study functions or games.

All students played Quizlet Live with in their groups, not show in this table.

Appendix K: Schema Development Frequency Data

Student	Existing schema	Definition their words	Movie Example	Pictorial Example	Explained Examples
1					
2	#	#	#	#	#
3					
4					
5					
6	#	#	#	#	#
7					
8	#	#	#	#	#
9	#	#	#	#	#
10	#	#	#	#	#
11					
12					
13					
14					
15					
16	#	#	#	#	#
17					

18					
19					
20					
21					
22					
23					
24					
25	#	#	#	#	#
26	#	#	#	#	#
27					
28	#	#	#	#	#
29	#	#	#	#	#
30					
31	#	#	#	#	#
32					
33					
34	#	#	#	#	#
35	#	#	#	#	#
36	#	#	#	#	#
37					
38					
39					
40					
41					

42					
43					
44	#	#	#	#	#
45					
46	#	#	#	#	#
47					
48					

Sixteen (16) students' flashcards showed evidence of effectively using all five schema development strategies.

Appendix L: Student Assent Form

UNIVERSITY OF SOUTH CAROLINA

ASSENT TO BE A RESEARCH SUBJECT

[The Impact of Quizlet on Social Studies Students' Achievement]

I am working on my dissertation through the University of South Carolina. I am researching and writing about a study pertaining to vocabulary development and the use of Quizlet, a vocabulary building application and I would like your help. I am interested in learning more about schema development and Quizlet as a formative assessment. Your parent/guardian has already said it is okay for you to be in the study, but it is up to you if you want to be in the study.

If you want to be in the study, you will be asked to do the following:

1. Complete a pre-test, post-test, a summative assessment, a survey about prior knowledge of content vocabulary, a questionnaire about your perceptions pertaining to the use of Quizlet.
2. Complete a Unit of study in iCivics.

Any information you share with me (or study staff) will be private. No one except your parents and I will know how you responded to the questions.

You do not have to help with this study. Your personal information will be deleted before the analysis of data begins. Being in the study will not help or hurt your grades. You can also drop out of the study at any time, for any reason, and you will not be in any trouble and no one will be mad at you.

Please ask any questions you would like to about the study.

Signing your name below means, you have read the information (or it has been read to you), and that your questions have been answered in a way that you can understand, and you have decided to be in the study. You can still stop being in the study any time. If you wish to stop, please tell the researcher or study team member.

Print Name of Minor	Age of Minor
Signature of Minor	Date

Appendix M: Parent Consent Form

UNIVERSITY OF SOUTH CAROLINA

CONSENT TO BE A RESEARCH SUBJECT

The Impact of Quizlet on Social Studies Students Summative Assessment

KEY INFORMATION ABOUT THIS RESEARCH STUDY:

You student has been invited to volunteer for a research study conducted by Gaye Tolleson. I am a doctoral candidate in the Department of Education at the University of South Carolina. The purpose of this study is to explore the impact of schema development and Quizlet on students' summative achievement. Your student is being asked to participate in this study because they are a 7th grade student taking iCivics. This study is being done at Pleasant Hill Middle School and will involve approximately 50 volunteers.

The purposes of the research are to explore the impact of schema development and Quizlet on social studies students' vocabulary summative assessments. Also, the study analysis will reflect on student perceptions pertaining to their use of Quizlet. The expected duration of participation is ten school days. The procedures will include a pre-test and post-test on iCivics vocabulary and a summative test. The students will complete a unit of study with the teacher/researcher guiding them through schematic development of related vocabulary terms.

There are no expected risks or discomforts associated with this study, but the benefits to you and future students will be the motivating knowledge of the impact of using Quizlet can have on summative assessments. This unit of study is one completed by iCivics students each year, but by participating in the study data can be gathered and analyzed to see what impact schema development and Quizlet have on student learning reflected in their achievement.

This form explains what you will be asked to do, if you decide to participate in this study. Please read it carefully and feel free to ask questions before you make a decision about participating.

PROCEDURES:

If you agree to allow your student to participate in this study, they will do the following:

1. Complete a pre-test, post-test, summative assessment a survey about prior knowledge of content vocabulary, a questionnaire about your perceptions pertaining to the use of Quizlet.
2. Complete a unit of study in iCivics.

DURATION:
Participation in the study involves ten class periods over a period of two weeks. Each period will last about 52 minutes.

RISKS/DISCOMFORTS:
There are no expected risks or discomforts associated with this study.

BENEFITS:
Taking part in this study may not benefit the student personally. However, this research may help researchers understand the impact of Quizlet on social studies students' achievement.

COSTS: There will be no costs to your student for participating in this study and there is not extra credit offered because this is a naturally occurring lesson in the iCivics curriculum.

RETURN OF CLINICALLY RELEVANT RESEARCH RESULTS: Research results will be shared with Lexington One District Office Research Studies Committee

CONFIDENTIALITY OF RECORDS: I will destroy all instruments used to collect data, recordings, and any documents with personally identifiable information within one year of completion of the study.

VOLUNTARY PARTICIPATION:

Participation in this research study is voluntary. Your student is free not to participate, or to stop participating at any time, for any reason without negative consequences. In the event that they do withdraw from this study, the information they have already provided will be kept in a confidential manner. If they wish to withdraw from the study, please call or email the principal investigator listed on this form.

I have been given a chance to ask questions about this research study. These questions have been answered to my satisfaction. If I have any more questions about my participation in this study, or a study related injury, I am to contact Gaye Tolleson, gtolleson@lexington1.net, 803 821-2602 or Christopher Bogiages at bogiages@mailbox.sc.edu.

I agree to allow my student to participate in this study. I have been given a copy of this form for my own records.

If you wish to participate, you should sign below.

Signature of Subject / Participant	Date
Signature of Qualified Person Obtaining Consent	Date