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Boys, Reading, and Video Games: A Mixed-Methods Case Study Examining the Effects of Using a Recreational Video Game to Improve Reading Comprehension Performance at an Elementary School in Texas

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BOYS, READING, AND VIDEO GAMES: A MIXED-METHODS CASE
STUDY EXAMINING THE EFFECTS OF USING A RECREATIONAL
VIDEO GAME TO IMPROVE READING COMPREHENSION
PERFORMANCE AT AN ELEMENTARY SCHOOL IN TEXAS

by

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DEDICATION

I dedicate this dissertation to my beloved Grandma Betty Jo Meyer, whose wish to 10-year-old me while on her deathbed in May 1995 was that I “graduate.” Many people in my family, including my parents, did not graduate from high school. I will never forget her request, asked in her sweet, soft voice as she lay in bed, wrapped in blankets in her room surrounded by family. This simple and seemingly small request has transformed into much more over the years, reminding me to never quit during adverse times, go the extra mile to accomplish any task, and seize every opportunity.

My grandmother Betty was born on October 24, 1938, raised in San Antonio, Texas, married to Andrew T. Meyer, and blessed with three children. She was one of the nicest and sweetest people I have known, who would do anything for people. On May 30, 1995, Betty left us at 56 from natural causes. I wish she were alive to meet my wife and children and be part of my intellectual journey and this fascinating study. Although she is not with us today, I know she is with us in spirit. This dissertation is for you, Grandma. Thank you for the “word” of encouragement, for always believing in me, and for being an amazing example. I love you.

ACKNOWLEDGMENTS

This study would not have been possible without God and His amazing grace, love, and selflessness. He never left my side. I pray this study positively impacts our education system for years to come. Thank you, God, for having mercy on me and giving me the strength to complete this study.

I could not have conducted this study without the support of my amazing wife. As I spent countless hours at work and then in our bedroom completing required coursework and this study, Kelly masterfully cared for our three children, home, and everything in between, ensuring I had what I needed to thrive in this program. Kelly, I cannot thank you enough for what you did for me. I know this journey has not been ideal. We did it! I promise to make it up to you every day. I love you.

I owe a deep sense of gratitude to my mother and my sister. My mother kept me grounded in God and gave me the encouragement I needed, as she usually does, especially when things got challenging. Furthermore, I could not have conducted this study without my sister's commitment and desire to work with me. Words cannot describe how thankful I am for her contributions and support. You are amazing!

Finally, my dissertation advisor, Dr. Ismahan Arslan-Ari, was incredible! She led, coached, and mentored me over the past three years. Her timely advice, meticulous scrutiny, and scholarly guidance were unmatched. I learned so much from you. Thank you, Ma'am.

ABSTRACT

The fifth-grade boys at an elementary school in Texas consistently perform lower than girls on the State of Texas Assessments of Academic Readiness (STAAR) reading portion. The gender gap in reading is not exclusive to this school. Boys score lower than girls on state-administered reading assessments each year in the United States (U.S.) and have done so for decades (Bozack & Salvaggio, 2013; Clinton et al., 2014; Schwabe et al., 2015; Schwanenflugel & Knapp, 2018). This study explored the effects of using a recreational video game on fifth-grade boys struggling with reading comprehension in a six-week-long reading intervention program.

This study used a mixed-methods case study that lasted 28 weeks and comprised three phases: 1) Administrative, 2) Data collection, and 3) Data analysis. The participants included six tier-two and three readers, as determined by their Measure of Academic Progress (MAP) test scores. They met with the reading teacher for an hour each week. Participants completed and reviewed the pretest containing 10 reading questions from the 2018 STAAR on week one; received a mini-lesson on reading comprehension strategies, participated in a guided discussion, played *To the Moon* on their Google Chromebooks, and took and reviewed a formative assessment on weeks two through five; and conducted the posttest containing 10 reading questions from the 2019 STAAR, Student Focus Group Interview, and Student Attitudes Survey on week six.

The researcher conducted inductive analysis on the Student Focus Group Interview and part two of the Student Attitudes Survey using Delve. Three themes

emerged from the data: 1) Reading Comprehension Performance, 2) Impressions of To the Moon, and 3) Attitudes Toward Video Games. He conducted descriptive statistics of the pretest, posttest, formative assessments, and part one of the Student Attitudes Survey. The participants' performance improved from the pretest ($M = 40$, $SD = 22.40$) to the posttest ($M = 42$, $SD = 13.30$). Three boys saw significant improvement in their performance, with one increasing his score by 30 points. Overall, the participants had positive attitudes toward using To the Moon to improve their reading comprehension performance.

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CHAPTER 1

INTRODUCTION

National Context

Boys score lower than girls on state-administered reading assessments each year in the U.S. and have done so for decades, according to the National Assessment of Educational Progress (NAEP) (Bozack & Salvaggio, 2013; Clinton et al., 2014; Schwabe et al., 2015; Schwanenflugel & Knapp, 2018). The gender gap begins in elementary school and continues throughout a boy's K-12 education (Bozack & Salvaggio, 2013; Clinton et al., 2014; Schwanenflugel & Knapp, 2018). This problem is persistent, unsolvable, and not limited to the U.S., as evidenced by Programme for International Student Assessment (PISA) research and analysis in over 40 countries since 2000 (Clinton et al., 2014; Schwanenflugel & Knapp, 2018; Torppa et al., 2018). There is no definitive explanation for the gender gap in reading, although several scholars, such as Schwanenflugel and Knapp (2018) and Torppa et al. (2018), have identified possible hypotheses. Continuing study into this issue is critical to avoiding the profound consequences this problem could have on today's workforce, where advanced literacy skills are needed (Clinton et al., 2014; Schwabe et al., 2015).

The nationwide pressure to meet grueling standards placed on teachers and schools complicates this problem, exacerbated by annual performance evaluations and the drive for students to perform within or above established standards on state-administered assessments (McDermott & Gormley, 2016). Many states and school

districts limit teachers and their schools from integrating and using imaginative, out-of-the-box solutions that incorporate modern technology in teaching their students reading fundamentals (McDermott & Gormley, 2016). Instead, these teachers pursue traditional and more conservative approaches in preparing their students for state-administered assessments. They generally understand that their boys will perform slightly below girls in reading each year (McDermott & Gormley, 2016). Solutions begin with senior national and state educational leaders encouraging K-12 teachers to experiment with and implement modern technology in the classroom, including vetted recreational video games, as nine-in-ten boys have these types of games or have access to them and enjoy playing them (Alqahtani, 2020; Anderson & Jiang, 2018; Ronimus et al., 2019).

Game-based learning focused on improving reading comprehension is valuable and provides students with critical skills and expertise and meets, complements, and in some cases, enhances formal curriculum and instruction taught in public schools (Elliott, 2014). Teachers could leverage boys' love for video games to help them in school and state-administered assessments (Cummings et al., 2018). One significant problem is that many teachers in the U.S. do not have an in-depth understanding of video games and how to properly integrate them into reading lessons or intervention programs (Gerber & Price, 2013).

Research supporting video games' effectiveness for improving academic performance in the classroom and on state-administered assessments has shown mixed results. Some researchers and studies support using video games to help boys struggling with reading comprehension (Aberg-Bengtsson & Rasmusson, 2015; Alshaiji, 2015; Bugmann, 2018; Carroll, 2016); while others do not (Dindar, 2018; Drummond & Sauer,

2015). Most studies using video games in reading programs in K-12 education are too broad or too specific in scope, do not focus on elementary-aged boys, and do not identify or recommend ethically, morally, and culturally appropriate recreational video games. Despite the discrepancy in conclusions, K-12 teachers should not dismiss the use of recreational video games in reading intervention programs (Blampied et al., 2015). Further research is required to determine the effectiveness of recreational video games in improving boys' reading comprehension performance in class and on state-administered assessments.

Local Context

Thirty-three fifth-grade boys attend a Title One PK-8 elementary school in Texas. Almost every boy in this grade is Hispanic, between ten and eleven years old, and reads, writes, and speaks English fluently. These boys performed 6.65 percent lower than girls in the same school in analyzing, making inferences, and drawing conclusions in the reading portion of the STAAR, taken in April 2019 (Texas Education Agency, 2019). The differences in scores between the boys and girls were consistent among every public school in Texas, with occasional outliers (Texas Education Agency, 2019). The fifth-grade boys at this school scored 24.78 percent below the girls on inference questions about theme and genre in different cultural, historical, and contemporary contexts (Texas Education Agency, 2019). They scored 4.91 percent below the district average on this standard among fifth-grade boys (Texas Education Agency, 2019).

The researcher created a 50-item survey after discovering this problem. Five teachers from the school completed it from June 12 to June 14, 2019. The survey comprised the following parts: 1) Participants (Questions 1-10), 2) Instruction

(Questions 11-28), 3) Teaching Strategies and Techniques (Questions 29-37), 4) The Subjects (Questions 38-47), and 5) Feedback from the Participants (Questions 48-50). Most of these questions were open-ended and focused on felt, expressed, or future needs specific to the subject. The survey incorporated short and multiple-choice formats, narrative-answer formats, and a five-point Likert-type scale. The survey responses provided the researcher with a better understanding of the problem. The results revealed that several fifth-grade boys at the school read below grade level and had difficulties making inferences based on fictional text.

Fifth-grade lessons and instruction on inferencing were not entirely adequate or relevant to boys (Reading Teacher, personal communication, June 14, 2019). The existing instruction lacked the integration and use of graphic novels, comic books, and stories featuring male protagonists or those considered humorous. The teacher seldom mentioned, incorporated, or used male role models when teaching inferences, nor did the strategies and techniques used maximize modern technology. The large reading texts the boys received often overwhelmed them. In addition, these teachers did not incorporate sufficient texts that interested their boy learners or allow them to apply what they learned in real-life situations and scenarios.

Statement of the Problem

Fifth-grade boys at this elementary school in Texas performed lower than girls in analyzing, making inferences, and drawing conclusions in the reading portion of the STAAR (Texas Education Agency, 2019). These boys struggled with making inferences given their reading fluency, inability to visualize what they read, limited vocabulary, and lack of background knowledge and experience needed to make real-world connections

(Reading Teacher, personal communication, June 14, 2019). Most of these boys did not identify essential details in the text they read nor think beyond the literal text and were uninterested in learning this skill. This led the researcher to consider if incorporating digital play into a reading intervention program using a reading-intensive recreational video game could provide these boys with “active, hands-on, and engaging” learning and improve their reading comprehension performance (Kervin, 2016, p. 70).

Purpose Statement

The purpose of this mixed-methods case study was to determine the effectiveness of using a recreational video game to support fifth-grade boys struggling with reading comprehension.

Research Question

This study sought to determine and understand the effects of using a recreational video game on fifth-grade boys struggling with reading comprehension in a six-week-long reading intervention program at an elementary school in Texas. Two questions guided the research and analysis:

1. How and to what extent does a recreational video game affect fifth-grade boys' reading comprehension performance?
2. What are the fifth-grade boys' experiences when playing a recreational video game to improve their reading comprehension performance?

Researcher Subjectivities and Positionality

The researcher is a military officer who has facilitated learning at military schools and a civilian university. He is the Learning Capabilities Officer for Training Command, within the U.S. Marine Corps Training and Education Command, responsible for

supporting entry-level and career progression training at 17 Major Subordinate Elements across the U.S. The researcher pursued the Doctor of Education in Educational Practice and Innovation, concentrating in Learning Technologies, from the University of South Carolina to grow as a scholar and practitioner and improve learning for those he serves in and out of the military.

Growing up, the researcher received a below-average education and disliked reading. In 2002, he graduated from high school and enlisted in the military, later earning a Bachelor of Arts in Clinical Psychology through American Military University while guarding U.S. embassies and consulates overseas. Despite his military certifications in facilitating learning experiences, designing learning experiences, and managing formal schools, he did not earn a degree in education, nor is he a certified K-12 teacher. Teaching adults in the military differs from teaching civilians, including children.

Pragmatism comprises diverse viewpoints, an objective and subjective epistemology, and a flexible methodology (Behak et al., 2016). Pragmatists focus on solving problems rather than seeking to understand the truth. Unlike the other paradigms, as a pragmatist, the researcher could use any research method necessary to study the phenomenon and work with the participants (Tracy, 2020). This paradigm gave him varying worldviews and assumptions and allowed him to use various data collection and analysis methods (Creswell, 2014). Although pragmatism has many benefits, it can still impact studies by wasting valuable time, effort, and resources by being too logical, straightforward, and oversimplifying the problem.

The researcher's positionality is: "outsider(s) in collaboration with insider(s)" (Herr & Anderson, 2005, p. 31). The fifth grade reading teacher assisted the researcher in this study. Her extensive involvement had the propensity to impact the research. For instance, she may not have implemented the reading intervention program per established guidelines and expectations or taken detailed notes during the Student Focus Group Interview. As an outsider, the researcher had to build a rapport with the reading teacher, elementary school, and district in advance. Then, he submitted a detailed request for experimentation to the district for approval, containing the first three chapters of his dissertation and the instruments he intended to use months before the study began. This increased their awareness and allowed the researcher to proceed with this study. Clear and direct communication between all parties was essential.

The researcher was born in Texas, once one of the boys he aimed to help, and invested in understanding this problem and contributing to its cause through his work. The researcher studied this problem as an outsider with a diverse military career, may have viewed it differently, and pursued solutions not commonplace in K-12 education. His paradigm and positionality may have affected his work: he has not lived in Texas for over 20 years, is not a K-12 teacher, nor does he have prior knowledge and experience in teaching reading comprehension to fifth-grade boys. Therefore, the researcher relied on the reading teacher's firsthand perspective of what occurred throughout the study and the quantitative and qualitative data he collected and analyzed. It is possible he missed important data points from not being the reading teacher or in the classroom with the participants.

Definition of Terms

Common Core State Standards (CCSS): High-quality academic standards in mathematics, English language arts, and literacy. They outline what a learner should know and be able to do at the end of each grade (About the Common Core State Standards, 2022).

Measures of Academic Progress: An adaptive computer assessment designed to measure a student's growth in math, reading, language use, and science (Northwest Evaluation Association, 2017).

Reading Attitudes: A learner's feelings about reading, their perception of themselves as a reader, and how they engage in reading or reading-related activities (Asplund, 2018; Conradi et al., 2013; Pegram, 2016).

Reading Comprehension: Reading a passage, understanding its meaning, and identifying essential information to make inferences (Gutkind, 2012).

Reading-Intensive Recreational Video Game: A commercial off-the-shelf video game available for purchase at a brick-and-mortar store or downloadable online, considered and labeled as "recreational" and not "educational," and frequently requires the player to read the commentary to accomplish tasks and level up.

Reading Motivation: "An individual's personal goals, values, and beliefs with regard to the topics, processes, and outcomes of reading" (Barber & Klauda, 2020, p. 28).

State of Texas Assessments of Academic Readiness: A state-administered assessment based on curriculum standards in core subjects measuring a learner's ability to apply the knowledge and skills they learned in grade (Texas Education Agency, 2018).

Texas Essential Knowledge and Skills (TEKS): The state standards for what learners should know and be able to do in each subject and grade level (Texas Education Agency, 2018).

CHAPTER 2

LITERATURE REVIEW

Introduction

The purpose of this mixed-methods case study was to determine the effectiveness of using a recreational video game to support fifth-grade boys struggling with reading comprehension at an elementary school in Texas. This literature review focused on the following research question: What is the effect of using a recreational video game on fifth-grade boys struggling with reading comprehension in a six-week-long reading intervention program at an elementary school in Texas? Two sub-questions guided the research and analysis: (1) How and to what extent does a recreational video game affect fifth-grade boys' reading comprehension performance? (2) What are the fifth-grade boys' experiences when playing a recreational video game to improve their reading comprehension performance?

Literature Review Method

The research questions comprised four categories: (a) video games, (b) reading comprehension, (c) boys, and (d) intervention programs. Keywords for each category emerged and were used in the form of Boolean Logic during searches in the Thomas Cooper Library "Find It" search engine, Education Source, Education Resources Information Center, International Literacy Association, and Google Scholar. Keywords, as organized in Table 2, included video games, recreational video games, entertainment video games, computer games, game-based learning, and computer-assisted instruction

for category (a); literacy, reading, and reading comprehension for category (b); gender gap, gender differences, and boys for category (c); and intervention, experiment, classroom, and instruction for category (d). Searches were exclusive to peer-reviewed journals and dissertations, published from 2016 to 2021, written in English and specific to children, adolescents, and K-12 education, and emphasized elementary school, upper elementary, and middle school.

Table 2.1

Key Words

Topical Category	Search Keywords
a. Video games	Video games, recreational video games, entertainment video games, computer games, game-based learning, and computer-assisted instruction
b. Reading comprehension	Literacy, reading, and reading comprehension
c. Boys	Gender gap, gender differences, and boys
d. Intervention programs	Intervention, experiment, classroom, and instruction

Four main sections comprise this literature review: (a) The gender gap in reading comprehension performance, (b) Using video games to improve boys' reading comprehension performance, (c) Best practices, and (d) Summary. The first section defines and explains reading comprehension and explores the gender gap in reading comprehension. The second section examines recreational video games, the boy culture, and how these games support learning and may improve reading development and skills. The third section addresses best practices for selecting and integrating recreational video

games into the reading curriculum and pedagogy and the preferred way of doing this for boys. This chapter concludes by summarizing the main points from all three sections.

The Gender Gap in Reading Comprehension Performance

This section defines and explains reading comprehension and discusses the gender gap in the classroom and national and international reading assessments and its significance to elementary-aged boys. It transitions and concludes by addressing the main contributing factors affecting boys' reading comprehension performance. The following three subsections guide the discussion: (a) Reading comprehension, (b) The gender gap, and (c) Contributing factors.

Reading Comprehension

Reading comprehension is a subset of reading and is the process of activating, revising, and creating a schema; developing a mental representation of the text; and interpreting and determining the meaning of the information (Gutkind, 2012; Kenyon et al., 2018; Landi & Ryherd, 2016; Schwabe et al., 2015). It involves lower- and higher-level cognitive processes and reading skills and is foundational in reading development and educational success (Bartha & Elleman, 2017; Dogan et al., 2015; Hamilton & Jones, 2016; Yanga et al., 2018). Some of these processes and skills include working-memory capacity, decoding, ability to recall semantic information accurately and quickly at the word level, vocabulary, general knowledge, and reading fluency (Bartha & Elleman, 2017; Fenty et al., 2015; Landi & Ryherd, 2016; Ngabut, 2015).

Inference making, a higher-level cognitive process, and reading skill significantly affect reading comprehension among elementary-grade students (Bartha & Elleman, 2017; Duncan, 2016). Inference making facilitates reading comprehension and is the

cognitive process readers perform when connecting important information within and between the text to one's general knowledge of the topic to build sentence and discourse-level meaning (Bartha & Elleman, 2017; Duncan, 2016). Elementary-grade students form text-based and knowledge-based inferences when reading (Bartha & Elleman, 2017; Duncan, 2016). Text-based inferences link information the student reads to what they previously read, and knowledge-based inferences integrate new information extracted from the text to their prior knowledge of the topic (Bartha & Elleman, 2017; Duncan, 2016). Both inferences help students fill in gaps in the text or understand the subject (Bartha & Elleman, 2017; Duncan, 2016). A reading intervention program containing explicit instruction in forming text and knowledge-based inferences and building content knowledge may significantly improve reading comprehension performance among elementary-age students (Bartha & Elleman, 2017).

The Gender Gap

Girls continue outperforming boys in reading abilities, achievement, and assessments in every grade nationally and across all Organisation for Economic Co-operation and Development (OECD) countries (Hamilton & Jones, 2016; Kingdon et al., 2017; Reilly et al., 2018; Solheim & Lundetrae, 2018;). The gender gap begins at school entry, with a slight difference between girls and boys, and accelerates and widens as children transition to secondary school and high school (Kingdon et al., 2017; Reilly et al., 2018). Findings remain consistent with recent NAEP and PISA reports, despite some researchers on this subject determining “marginal” to any statistical gender differences in reading outcomes (Fletcher & Nicholas, 2016; Hamilton & Jones, 2016; Hein et al., 2016; Kingdon et al., 2017; Scholes, 2019). This gender gap is of particular concern, as

early reading comprehension performance may impact general academic achievement and reading competence necessary in today's workforce, coupled with the fact that one and a half more boys than girls experience grade retention, remedial service, expulsion, and school dropout (Borgonovi, 2016; Dogan et al., 2015; Kingdon et al., 2017; Solheim & Lundetrae, 2018). Continued attention, early interventions, and efforts to improve boys' reading comprehension performance in elementary school are needed to reduce the gender gap in reading and counter the long-term effects it has on boys and society (Borgonovi, 2016; Kingdon et al., 2017; Schwabe et al., 2015; Solheim & Lundetrae, 2018).

Contributing Factors

Reading Motivation. Boys' reading motivation is recognized as one of the most critical factors to consider when studying the gender gap in reading development and performance (Schwabe et al., 2015; Solheim & Lundetrae, 2018; Yanga et al., 2018). Reading motivation is multifaceted and affects reading frequency, comprehension, persistence, engagement in class, and effort during reading assessments (Cummings et al., 2018; McGeown, 2015;). Intrinsic reading motivation, an essential dimension of reading motivation, is an individual's drive to read for pleasure, attain personal goals, and satisfy curiosity (Schwabe et al., 2015). Reading motivation increases when people engage in highly interesting or rewarding reading tasks (Cummings et al., 2018). Identifying and incorporating innovative methods using modern educational technology to deliver multimodal literacy to disengaged boys in the traditional classroom is crucial and may increase their reading motivation (Hamilton & Jones, 2016; McGeown, 2015).

Reading Attitudes. Girls consistently score significantly higher than boys on reading surveys measuring attitudes (Mohd-Asrafl & Abdullah, 2016; Scholes, 2019; Solheim & Lundetrae, 2018). Reading attitudes are defined as a developed or developing interest or motivation in reading texts, narratives, and books (Asplund, 2018; Pegram, 2016). Positive reading attitudes directly correlate to increased reading comprehension performance and motivation (Mincey-Jones, 2017; Pegram, 2016; Torpa, 2018). The variation in reading attitudes among boys and girls is identified in elementary school and continues throughout K-12 education (Duncan, 2016; Mohd-Asrafl & Abdullah, 2016; Scholes, 2019). Unlike girls, most boys have lower recreational and academic reading attitudes, do not enjoy the social aspects of reading, and are uninterested in the reading material they receive at school and on reading assessments (Mohd-Asrafl & Abdullah, 2016; Scholes, 2019; Schwabe et al., 2015; Solheim & Lundetrae, 2018). Poor reading attitudes affect reading enjoyment, frequency, comprehension, class participation, and performance (Mohd-Asrafl & Abdullah, 2016; Schwabe et al., 2015; Scholes, 2019; Solheim & Lundetrae, 2018). The importance of this issue requires further research on instructional practices and preferred text content corresponding to the needs of boys, beginning in elementary school, to improve their reading attitudes and narrow the gender gap in reading comprehension (McGeown, 2015; Mohd-Asrafl & Abdullah, 2016; Schwabe et al., 2015; Scholes, 2019).

Attention. Attention differences between boys and girls may partially explain the gender gap in reading comprehension performance (Kingdon et al., 2017; Mincey-Jones, 2017; Solheim & Lundetrae, 2018). Girls begin elementary school with more advanced cognitive abilities than boys. These include verbal fluency, perceptual speed, better-

developed attention, and self-regulatory skills (Kingdon et al., 2017; Mincey-Jones, 2017; Solheim & Lundetrae, 2018). Because of this, girls are more engaged with and profit from educational instruction, have an academic advantage, and continue outperforming boys in reading in middle and high school (Kingdon et al., 2017; Solheim & Lundetrae, 2018). In contrast to girls, schools are more likely to identify boys as learning disabled, delinquent, or at-risk and having inattentive, hyperactive, and impulsive behaviors. These detriments impact boys' sequential skill acquisition, general academic success, and cognitive and language development skills, including reading comprehension (Engerman et al., 2015; Kingdon et al., 2017; Mahmoodi-Shahreabaki, 2019; Mincey-Jones, 2017). Studies have found that recreational video games can increase boys' cognitive functions, improve their attention, and enhance their executive functioning (Martinez et al., 2022). Moreover, boys with fewer attention difficulties often have higher academic performance in elementary school (Kingdon et al., 2017).

The Traditional Classroom, Instruction, and Teaching Methods. It is unclear from the literature if the traditional classroom environment, instruction, and teaching methods used in elementary school contribute to the gender gap in reading comprehension performance. Boys' interests, values, and motivations may be at odds in traditional classrooms and with course content and expectations (Carr-Chellman, 2019; Eate et al., 2017; Engerman et al., 2019; Hein et al., 2016). Schools and teachers may intentionally and unintentionally alienate boys, their culture, and unique learning preferences, comprising active, competitive, physical, assertive, and technology-oriented learning, by emphasizing compliance and eliminating socialization practices (Carr-Chellman, 2019; Eate et al., 2017; Engerman et al., 2019). Conversely, boys and girls

may not be fundamentally different in reading, necessitating gender-specific teaching and instruction, nor benefit from gender-segregated education or school (Reilly et al., 2018). Reading performance in sex-segregated learning environments is statistically non-significant and changing the curriculum and teaching methodology for boys affects girls' learning and performance, explaining why many teachers strive to support the individual learner and use gender-neutral teaching methods and strategies in reading instruction (Eate et al., 2017; Hamilton & Jones, 2016; Reilly et al., 2018; Solheim & Lundetrae, 2018). The disparity in learning literature warrants further research studying the effects of using boy-centric teaching methods and technology in reading instruction in traditional classrooms and reading intervention programs.

Using Video Games to Improve Boys' Reading Comprehension Performance

An enduring question in education remains whether incorporating recreational video games in the classroom can improve boys' reading comprehension performance and, if so, what type of learning occurs (Spires, 2015). The educational potential of recreational video games has prompted researchers and practitioners to experiment with using them on children in the classroom (Mahmoodi-Shahrehabaki, 2019). The following subsections comprise this section: (a) Recreational video games, (b) The boy culture, (c) Supports learning, and (d) Improves reading development and skills.

Recreational Video Games

Teachers can use recreational video games as serious games for their learners to facilitate or enhance the acquisition of specific knowledge and skills or change behavior (Arnab et al., 2012; Huang, 2019; Southgate et al., 2017; Southgate & King, 2015; Spires, 2015). Learners can play them on school-issued laptops, video game consoles,

and mobile computing devices, such as tablets and smartphones (Southgate et al., 2017).

Recreational video games combine formal learning with entertainment (Arnab et al., 2012; Southgate et al., 2017). Game design elements include autonomous action and navigation, challenge, competition, progression through levels of difficulty, time constraints, immediate feedback, and ranks and rewards (Southgate et al., 2017).

Recreational video games can supplement the core curriculum of a subject (Huang, 2019; McTigue & Uppstad, 2018).

Recreational video games can promote the acquisition of specific skills through the game's strategies and approaches and support different educational standards and objectives (Borgonovi, 2016; Southgate et al., 2017). These games can include arcade games, strategy and logic games, and role-playing games where the player uses an avatar or character in a virtual world. They can also be realistic simulations, first-person shooter games, and god games, like *The Sims* (Southgate et al., 2017). These games are either single or multiplayer and may or may not require the internet (Borgonovi, 2016; Carroll, 2016; Southgate et al., 2017). Some recreational video games require the internet for the initial download and updates, and others require a constant connection to play the game (Southgate et al., 2017). While some U.S. teachers use recreational video games, like *Minecraft*, in K-12 education, many states and schools continue to reject their use and value (Engerman et al., 2019; Southgate et al., 2017).

Despite their benefits, many teachers avoid using recreational video games at school, given public perceptions and potential adverse effects (Bacalja, 2018; Engerman et al., 2019). They question how these types of games provide, support, or increase learning in the classroom (Martinez et al., 2022). Top-selling recreational video games in

the U.S. contain violence and require players to problem-solve in time-compressed firefights and battles to level up and improve their standings (Carroll, 2016). Boys play and prefer these types of games and consider video games, such as Call of Duty, among their favorites (Brooks et al., 2015; Carroll, 2016; Dindar, 2018). The public believes recreational video games lack educational value and have no place in education. They may contribute to aggressive behavior and violence and cause children to become inactive, socially isolated, and vitamin deficient (Bacalja, 2018; Carroll, 2016; Dindar, 2018). Despite these claims being inconclusive, using recreational video games in K-12 education remains contentious. For this reason, teachers and researchers using them should target specific domain knowledge areas for improving academic performance (Carroll, 2016; de Freitas, 2018; Dindar, 2018).

The Boy Culture

Gaming is vital in today's boy culture (Engerman, 2015; Hein et al., 2016). It is the main leisure activity for boys, given technological advances, their accessibility and proliferation in society and the household, and social changes (Arnab et al., 2012; Bacalja, 2018; Brooks et al., 2015). Boys game voluntarily and excessively, averaging an hour per sitting and more than six hours weekly, and are more skilled and experienced than girls (Bacalja, 2018; Borgonovi, 2016; Brooks et al., 2015; Carroll, 2016; Dindar, 2018). Gaming helps boys have fun, relax, express themselves in natural and healthy ways, connect and compete with other children in empowering virtual learning environments, and view failure as constructive and necessary for development (Bacalja, 2018; Carr-Chellman, 2019; Carroll, 2016; Engerman et al., 2015; Engerman et al., 2019). The significance and embeddedness of gaming in the boy culture highlight the

need for research further exploring how recreational video games can improve boys' reading comprehension (Engerman & Carr-Chellman, 2014).

Supports Learning

Reading Attitudes. Video games are increasingly popular for elementary and middle school students, and many students indicate that playing video games for fun increases their desire to read for enjoyment (Picton et al., 2020). Recent research suggests that video games can motivate students to read while boosting their confidence and reading abilities (Picton et al., 2020). Of the 4,626 11- to 16-year-old students who completed a survey conducted by the National Literacy Trust (NLT) in the United Kingdom (U.K.), 3,839 students indicated that they played video games and 1,619 students indicated that playing video games motivated them to read and become better readers (Picton et al., 2020). Students' drive to read increases when they choose what they want to read (Davila & Patrick, 2010). Students who read to increase their skills and level up in video games unknowingly advance and improve their literacy skills. This highlights that students who play video games are more motivated to read, have a better attitude toward reading, and can develop better reading skills (Davila & Patrick, 2010).

Reading in video games motivates students to read and creates an enriching experience (Conradi et al., 2013). Playing video games can improve students' attitudes and reading comprehension (Davila & Patrick, 2010). When students' attitudes toward reading improve from their experience in video games, their overall reading attitudes increase (Conradi et al., 2013). Students can further enhance their attitude toward reading when teachers incorporate video games into reading instruction (Conradi et al.,

2013). Teachers who do this can change and enhance their students' attitudes, including those already motivated to read (Conradi et al., 2013).

Motivating and Engaging. Recreational video games can motivate and engage boys to attain knowledge and learn skills because of the games' captivating and interactive virtual learning environments and focus on the learner and learner's interests (Arnab et al., 2012; Carroll, 2016; Engerman, 2015; Engerman et al., 2019; Huang, 2019). The high-quality narratives, graphics, music, and compelling characters used in many recreational video games can create and maintain a suspenseful atmosphere that draws boys into their digital worlds (Carroll, 2016; Hein et al., 2016; McTigue & Upstad, 2018). These virtual learning environments can be immersive, powerful, and engaging; be more effective and motivating than traditional instruction and educational material; and enable boys to take a more active role in their learning (Arnab et al., 2012; Carr-Chellman, 2019; Engerman et al., 2015; Hein et al., 2016; Huang, 2019).

Video games' motivating and engaging benefits can help boys retain what they have learned and endure better during academic adversity (Borgonovi, 2016; Brooks et al., 2015; Imlig-Iten & Petkol, 2018; Southgate et al., 2017; Spires, 2015). The extent of boys' motivation and engagement in using video games is unclear. Some findings confirm the effectiveness of these games on learning and retention, but not on motivation, as compared to traditional instruction, warranting their inclusion in future research (Carr-Chellman, 2019; de Freitas, 2018; Southgate et al., 2017).

Collaborative. Recreational video games can enhance collaboration among boys at school because of their engaging and peer-supported learning environments and ability to foster teamwork, camaraderie, and participation (Arnab et al., 2012). The

collaboration from playing recreational video games may be more important to boys' engagement and learning than the game's features since most boys prefer dual-player over single-player, view "teamwork" as fundamental to succeeding in the game, and enjoy playing in small groups (Borgonovi, 2016; Cummings et al., 2018; Dindar, 2018; Engerman & Carr-Chellman, 2014; McTigue & Uppstad, 2018). When playing recreational video games, boys tend to offer advice, tease, encourage, and challenge each other irrespective of the outcome, commiserate during challenging levels, and share their passion and excitement, bringing them and the class together (Carroll, 2016; Cummings et al., 2018; Engerman et al., 2019). In addition, they are more involved in game-related discussions at school from their time playing them together (Hein et al., 2016; Mahmoodi-Shahrehabaki, 2019).

Connected Learning Theory. Researchers exploring the effects of recreational video games on boys' reading comprehension performance should ground their work in an appropriate theory. The Connected Learning Theory is one of them. Teachers must make critical decisions on what technologies to incorporate into the classroom when providing reading instruction in the 21st century (Mahmoodi-Shahrehabaki, 2019; Yanga et al., 2018). The Connected Learning Theory is a developing educational approach recognizing that learning can happen anywhere, across time and place, and exploit students' interests (Bayeck, 2016; Mahmoodi-Shahrehabaki, 2019).

Considering today's demands and learning environments, the Connected Learning Theory supports student engagement, collaboration, and interests by connecting the learning in practice with the social aspect of the classroom environment (Bayeck, 2016; Carroll, 2016; King, 2015). Major philosophies channeling and guiding the integration of

video games into the classroom within this theory include interest-focused learning, a peer-supported culture and collaboration, production and performance-centered, and shared purpose and commitment (Bayeck, 2016; Carroll, 2016). The Connected Learning Theory considers the ever-changing and demanding context of 21st-century learning. Connected learning occurs when learners pursue something of personal interest or excitement alongside friends and adults and link the lessons learned from these activities to designated academic-related knowledge, skills, or attitudes (Bayeck, 2016).

Improves Reading Development and Skills

Reading Fundamentals. When teachers integrate recreational video games into reading instruction and intervention programs, they can provide students with reading fundamentals, increase their reading motivation and frequency, and improve their overall literacy. This improvement is essential because improved reading is a critical indicator of game success. The relationship between gaming and literacy is reciprocal, as those boys who play recreational video games must possess considerable literary and cognitive skills to play the game successfully (Carroll, 2016; Engerman et al., 2015; Mahmoodi-Shahrehabaki, 2019). Gaming can compel boys to learn new vocabulary words and understand how to spell and use them correctly in and out of the classroom while simultaneously developing the skills to interpret and infer clues in their texts (Engerman & Carr-Chellman, 2014; Hein et al., 2016; Mahmoodi-Shahrehabaki, 2019). Boys are also more motivated to read and read more when playing video games than printed texts (Carroll, 2016; Engerman & Carr-Chellman, 2014; Engerman et al., 2015; McTigue & Upstad, 2018; Spires, 2015). The use of video games may improve boys' literacy, and frequent engagement in the game may help them develop new literacy skills. However,

there remains a shortage of data proving the benefits of integrating recreational video games into reading instruction or intervention programs (Carroll, 2016; Engerman et al., 2015; Hein et al., 2016; Mahmoodi-Shahrehabaki, 2019; Spires, 2015).

Reading Comprehension. Reading-intensive recreational video games are meaning-making activities with consequences predicated on reading speed and comprehension accuracy. When included in reading instruction, these video games provide boys with reading comprehension practice that enhances and expands their metacognitive skills (Carroll, 2016; Engerman et al., 2019; Mahmoodi-Shahrehabaki, 2019). Literacy-related video games require boys to compare and contrast characters and significant moments in the video game, increasing their ability to analyze themes and make inferences (Engerman & Carr-Chellman, 2014; Hein et al., 2016; Mahmoodi-Shahrehabaki, 2019). Boys playing these games exhibit deep levels of understanding, have enhanced attention and focus, and have better strategic thinking skills (Cummings et al., 2018; Engerman & Carr-Chellman, 2014; Imlig-Iten & Petko, 2018; Mahmoodi-Shahrehabaki, 2019). Teachers could use reading-intensive recreational video games to narrow the gender gap in reading at school and on reading assessments, given the benefits and successes of video games in recent studies (Borgonovi, 2016; Mahmoodi-Shahrehabaki, 2019).

Learning Standards. The experience boys receive from playing reading-intensive recreational video games may align with designated reading comprehension standards used in K-12 education. However, little empirical evidence supports this claim, and available information appears ambiguous. Recreational video games can reinforce literacy development and allow boys to practice reading comprehension strategies aligned

with designated reading standards (Engerman & Carr-Chellman, 2014; Engerman et al., 2015; Hein et al., 2016; King, 2015; Mahmoodi-Shahrehabaki, 2019). These standards include reading and comprehending various informational text types and determining the main idea, theme, and author's point of view (Engerman & Carr-Chellman, 2014). The literature is unclear on which reading-intensive recreational video games teachers can use on boys in reading instruction, the specific learning standards these games reinforce and support, and how teachers can measure their learners' progress and improvement (de Freitas, 2018; Southgate et al., 2017; Spires, 2015).

Best Practices

Understanding that video games used in reading instruction support boys struggling with reading comprehension, there remains a challenge for teachers and researchers to determine the most effective and efficient ways of doing this in reading instruction and intervention programs (Bacalja, 2018; Fenty et al., 2015). This section includes the following subsections: (a) Game selection and (b) Integrating recreational video games into the classroom.

Game Selection

Elements of a Good Game. Using recreational video games in the classroom is hinged upon selecting the best and most appropriate game. Several defining components of a good game are having a clear goal, relevant rules, feedback and assessment options, and opportunities for student choices within the game. These all lead to higher levels of student engagement (Carroll, 2016; Southgate et al., 2017). Appropriate fantasy, points of curiosity, reasonable levels of challenge, and creative and interactive elements can increase boys' motivation, engagement, and genuine participation in the game (Bacalja,

2018; Carr-Chellman, 2019; Carroll, 2016; Imlig-Itten & Petko, 2018; Southgate et al., 2017). Selecting a game where the player has opportunities to make decisions that impact the game's trajectory gives the students a chance to “be in charge” of their game’s character. It gives the game a more realistic and believable environment. These design elements lead to a better product increasing the students’ overall learning experience (Engerman et al., 2015; Hein et al., 2016; Southgate et al., 2017). Teachers must use the elements of a good game when selecting recreational video games for reading instruction or intervention programs (Arnab et al., 2012; Carroll, 2016; McTigue & Uppstad, 2018).

Criteria for Selecting Recreational Video Games. When selecting recreational video games for use in reading programs, research recommends using games that support reading curriculum and standards, comply with school policies and information technology (IT) capabilities, and are appropriate for elementary-aged students (Carroll, 2016; Southgate et al., 2017). A suitable game should have good graphics, excellent character construction, an engaging storyline, and support multiple players (Beavis, 2014). Boys should be able to play the game within the limitations of the classroom and K-12 education (Carroll, 2016; King, 2016; McTigue & Uppstad, 2018; Southgate et al., 2017). These considerations will ensure the video game complements and enhances learning, adheres to school permissions, and is used effectively (Arnab et al., 2012; Engerman et al., 2015; McTigue & Uppstad, 2018; Southgate et al., 2017).

Integrating Recreational Video Games into the Classroom

Curriculum. Integrating recreational video games into the classroom requires a strong awareness of the game, extensive knowledge of the literacy curriculum, and solid familiarity with the learning goals to maximize the learning experience (Arnab et al.,

2012; McTigue & Uppstad, 2018; Southgate et al., 2017). The curriculum should drive whichever video game the teacher selects. Teachers should then play the game and become familiar with the specific type of learning their students would receive before preparing the corresponding curriculum. Some video games require ample time for gameplay. Teachers should consider beforehand whether their learners can play the game in segments during specific lessons or linearly and in its entirety, potentially requiring additional time and guidance (Arnab et al., 2012; King, 2015; Southgate et al., 2017). Encouraging teachers to examine the video game they want or have chosen ensures they know the game's limitations and that it would support their learning goals and objectives (Carr-Chellman, 2019; McTigue & Uppstad, 2018; Southgate et al., 2017).

Pedagogy. Research shows that teachers must perform various roles to incorporate video games into instruction effectively. Teacher familiarity with the game not only helps the teacher make necessary connections with their students and how to best serve their learning needs, but it also assists the teacher in handling any issues that may arise during gameplay (Marklund & Taylor, 2016; McTigue & Uppstad, 2018; Southgate et al., 2017). Game-based learning requires different skillsets from teachers and consequently places many demands on them to help facilitate the successful use of the video game in their classroom. The teacher may fill several roles: subject-matter expert, game administrator, facilitator, instructional supporter, and instructional designer (Arnab et al., 2012; Imlig-Iten & Petko, 2018; Marklund & Taylor, 2016; McTigue & Uppstad, 2018). In addition to being technically savvy, teachers will need to help students reflect on their choices during the game, model appropriate game-playing

behavior, and lead post-game discussions (Arnab et al., 2012; de Freitas, 2018; King, 2015; McTigue & Uppstad, 2018).

Teachers need to connect the gameplay from the recreational video game to designated reading-related skills, like traditional reading comprehension strategies, and incorporate other reading activities to enhance retention and learning. This reinforces expectations with the students and ensures they understand that gameplay sessions are for learning specific skills or working on specific skills while still having fun throughout the learning process (Bacalja, 2018; King, 2015; McTigue & Uppstad, 2018). When presenting the game to students and instructing them on the technical aspects of playing the game, teachers should assist them with connecting the new platform to what they already know about the subject. The students may have trouble building those connections independently without a teacher facilitating the process (Arnab et al., 2012; King, 2015; McTigue & Uppstad, 2018). Teachers can leverage group work and activities to enhance their learning from recreational video games. Allowing students to work together strengthens their learning and broadens their horizons on the challenges they may have experienced during the gameplay session (King, 2015; Southgate et al., 2017).

Teachers should encourage students to discuss what they are learning in the game and prompt them with ways to connect those skills to texts they are reading in class. Small groups help facilitate those conversations at a deeper level, as these briefing and debriefing sessions effectively provide depth to their learning (Arnab, 2012; King, 2015; McGeown, 2015; McTigue & Uppstad, 2018). By working with the students, teachers strengthen student literacy and problem-solving skills by debating various dilemmas they

encounter and critiquing the game's commentary and overall storyline. Having learners compare the game's storyline to other text they read in class can turn recreational video games from simply fun activities to an integral part of the curriculum (Carroll, 2016; McTigue & Uppstad, 2018; Southgate et al., 2017).

Boy Learners. Boys thrive when they actively participate in the learning process and collaborate with their classmates (Engerman et al., 2015; King, 2015; McTigue & Uppstad, 2018). Video games can be critical to their success in reading comprehension initiatives if they can participate in gameplay sessions with their friends and receive peer feedback, critiques, and compliments (King, 2015; McTigue & Uppstad, 2018). A teacher's knowledge and awareness of their learners' abilities are vital to successful instruction, even more, when considering the students' gaming literacy, interests, and motor skills when working to integrate video games effectively (King, 2015; Marklund & Taylor, 2016; Southgate et al., 2017). Boys will be more interested in learning new skills and reinforcing what they currently know when the learning focuses on topics or experiences that garner, sustain, and keeps them interested (Carr-Chellman, 2019).

Summary

The gender gap in reading continues in the U.S. and across all OECD countries (Hamilton & Jones, 2016; Kingdon et al., 2017; Reilly et al., 2018; Solheim & Lundetrae, 2018). Researchers have been unable to determine the root cause for this gap. Potential contributors exist, with reading motivation being one of the most significant to consider when studying this problem (Schwabe et al., 2015; Solheim & Lundetrae, 2018; Yanga et al., 2018). Although the extent of boys' motivation and engagement when using recreational video games is unclear, research indicates that these types of games can help

boys acquire new reading skills and knowledge, retain what they have learned, and better endure academic adversity (Borgonovi, 2016; Brooks et al., 2015; Imlig-Iten & Petkol, 2018; Southgate et al., 2017; Spires, 2015). For these reasons, recreational video games can provide boys with reading fundamentals and practice and potentially increase their reading motivation, frequency, and performance (Carroll, 2016; de Freitas, 2018).

The significance and embeddedness of gaming in the boy culture highlights the need for continued research exploring how teachers can integrate recreational video games into explicit reading instruction and intervention programs. When doing this, teachers should allow boys to collaborate in class during gameplay sessions and conclude these sessions with guided discussions, tying what they learned and experienced in the game to designated reading skills (Carroll, 2016; de Freitas, 2018; Southgate et al., 2017). Since reading-intensive recreational video games are meaning-making activities with consequences predicated on reading speed and comprehension accuracy, boys are more willing and excited to read and read more from the texts in video games (Carroll, 2016; Engerman & Carr-Chellman, 2014; Engerman et al., 2015; McTigue & Uppstad, 2018; Spires, 2015). After playing these video games in some studies, boys showed statistically significant increases in reading comprehension performance, with enhanced and expanded metacognitive skills (Carroll, 2016; Engerman et al., 2019; Mahmoodi-Shahrehabaki, 2019).

Selecting recreational video games and integrating them into the classroom is time-intensive (Arnab et al., 2012). Teachers will have to perform a myriad of additional duties and responsibilities, ensure their school and IT infrastructure supports these games, and that the game they select is socially, ethically, and developmentally appropriate for

their learners in K-12 settings (Carroll, 2016; King 2016; Marklund & Taylor, 2016; McTigue & Uppstad, 2018; Southgate et al., 2017). Moreover, they will have to consider how the game fits into the curriculum and pedagogy (Eate et al., 2017; Hamilton & Jones, 2016; Reilly et al., 2018). Finally, it is uncertain how recreational video games support reading CCSS or other state administered assessments. This lack of evidence may dissuade teachers from using them in the classroom (de Freitas, 2018; Southgate et al., 2017; Spires, 2015).

CHAPTER 3

METHOD

The purpose of this mixed-methods case study was to determine the effectiveness of using a recreational video game to support fifth-grade boys struggling with reading comprehension at an elementary school in Texas. The researcher sought to answer the following main question: What is the effect of using a recreational video game on fifth-grade boys struggling with reading comprehension in a six-week-long reading intervention program at an elementary school in Texas? The researcher focused the research and analysis on the following sub-questions:

1. How and to what extent does a recreational video game affect fifth-grade boys' reading comprehension performance?
2. What are the fifth-grade boys' experiences when playing a recreational video game to improve their reading comprehension performance?

Research Design

The researcher used a mixed-methods case study to evaluate the outcomes of using a recreational video game on fifth-grade boys in a six-week-long reading intervention program at an elementary school in Texas. A case study is an empirical method investigating a phenomenon on any topic, commonly known as the “case,” within a real-world context (Cronin, 2014; Hyett et al., 2014; Yin, 2018). These studies focus

on one or more cases. Each case is complex, significant, and bound to a person, group, institution, or organization, and the analysis undertaken is complete (Hamilton & Corbett-Whittier, 2013; Tight, 2017; Yin, 2018). Researchers conducting case studies can use various data collection tools, data, and perspectives from the participants, parents, or guardians (Hamilton & Corbett-Whittier, 2013; Tight, 2017; Yin, 2018). Like most studies, case studies serve a purpose that depends on the researcher and their focus. They can explore an aspect of one's professional practice, target a specific problem, and help researchers understand an element of education in greater detail (Hamilton & Corbett-Whittier, 2013). A case study was best suited for this research compared to action research, as the sample was outside the researcher's scope of influence.

Plano Clark and Ivankova (2016) define mixed methods research as the research process researchers use to intentionally integrate quantitative and qualitative data collection and analysis methods to best address a research problem. Adhering to this type of study, the researcher used the convergent parallel mixed method design, "also known as a triangulation or concurrent mixed-methods design" (DeCuir-Gunby & Schutz, 2017, p. 91) to combine, mix, and use quantitative and qualitative research data, methods, and techniques (Yin, 2018). Within the convergent parallel mixed method design, researchers collect both types of data individually or simultaneously, analyze each separately while giving equal value to both, informally compare the two forms of data, and determine the results and make appropriate conclusions (DeCuir-Gunby & Schutz, 2017; Mertler, 2019). In this design, researchers can collect richer and more substantial evidence, use both types of data to triangulate findings, improve their study's credibility, and answer

more complex research questions (DeCuir-Gunby & Schutz, 2017; McCaslin & Scott, 2003; Merriam & Tisdell, 2016; Yin, 2018).

Setting

The researcher conducted this study at a Title One elementary school in Texas, comprising 36 teachers and 600 students. The preponderance of the students at this school was Hispanic and came from low-income families. There were 43 fifth-grade students between 10 and 11 years old, with 50 percent being boys at the time of this study. Before the study began, the reading teacher conducted mandatory weekly tutoring in the fifth grade reading classroom for all tier-two and three readers, as determined by their MAP scores. During these sessions, students received a short lesson on a reading-related subject, lasting 15 to 20 minutes, and then participated in guided practice assignments in small groups or on their own. On certain days, students worked independently. Not one session was the same. Students used books, worksheets, and other learning tools in class and on their school-issued 11.6-inch Hewlett Packard Google Chromebook laptops, with a 16:9 ratio, to access material, participate in activities, and complete assignments. All students were issued headphones and could access the school's Wi-Fi, Google Drive, and internet in the reading classroom.

Participants

The researcher and reading teacher used a purposeful sample in this study, fitting the parameters of the research questions and goals per Tracey (2020). Six tier-two and tier-three fifth-grade boys were selected and volunteered to participate in this study (see Table 3.1). This section examines each of them and the reading teacher in the following

order: (a) Alejandro, (b) Christopher, (c) Enrique, (d) Fernando, (e) Julio, (f) Theodore, and (g) Reading Teacher.

Table 3.1

Demographics of the Participants

Participant	Pseudonym	Gender	Age	Reading Level
1	Alejandro	Male	11	3rd Grade
2	Christopher	Male	10	Beginner
3	Enrique	Male	11	1st Grade
4	Fernando	Male	11	Beginner
5	Julio	Male	10	4th Grade
6	Theodore	Male	10	4th Grade

Alejandro

Alejandro is 11 years old and lives with his maternal grandmother. He reads, writes, and speaks English and is in special education. His fall MAP score was 172, third percentile, and his winter MAP score was 190, thirteenth percentile. Alejandro did not meet the fourth-grade STAAR requirements last year and currently reads at a beginning third-grade reading level. His grandmother has difficulty getting him to complete the required readings for his daily homework. The reading teacher was unsure which video game system he has at home. From her account, he plays video games regularly. Alejandro struggles with reading fluency and accuracy, negatively affecting his reading comprehension. His reading comprehension is significantly higher when listening to read-aloud stories and books.

The reading teacher must remind Alejandro to stay on task in reading class. He gets distracted when reading material on his computer. When working in small groups, Alejandro is more likely to volunteer to read aloud than if he worked independently. In

early 2022, the reading teacher had difficulty getting him to complete reading tasks in class. Since then, he has worked hard and is doing better in finishing his assignments. Alejandro has not had any behavior issues in reading class. However, he has gotten in trouble in some of his other classes.

Christopher

Christopher is 10 years old and lives with his mother. His grandparents are regularly involved in his life. He reads, writes, and speaks English and is in special education. His fall MAP score was 157, first percentile, and his winter MAP score was 195, twentieth percentile. Last year, he did not meet the fourth-grade STAAR requirements and currently reads at a beginning reading level. His grandparents ensure he completes the preponderance of his homework, but do not make him complete his reading homework. Thus, he does not do it. Although Christopher enjoys reading, he struggles with decoding words, fluency, and accuracy. He can recall the story in a novel, understand the author's main idea, and has increased comprehension when listening to a read-aloud story.

Christopher genuinely enjoys read-aloud books. He likes to follow along on applications with that feature, such as Epic. Each day, he gets pulled out of class for 30 minutes for special education intervention. He does play video games at home. The gaming system is unknown. Christopher does not have behavioral problems. He can be immature at times for his age, regularly joking and playing around in class with his friends, but he listens to the reading teacher, gets along, and works well with his classmates.

Enrique

Enrique is 11 years old, Fernando's twin brother, one of nine children, and lives with his mother, an elderly widow. He reads, writes, and speaks English, and while he is not in special education, he is diagnosed with dyslexia. His fall MAP score was 176, fifth percentile, and his winter MAP score was 208, fiftieth percentile. He did not meet the fourth-grade STAAR requirements and currently reads at a first-grade reading level. His mother is not always available to help him with his homework, including his reading assignments.

Enrique has the most challenging time with decoding, fluency, and comprehension. Like the others, he does much better with comprehension, understanding, and retelling aspects of a story from read-aloud books. Enrique does well on vocabulary and recognizing the author's main idea. He can have difficulties working independently on grade-level text. Given his mandated reading accommodations, he usually finishes his assignments in class on time. Enrique has a habit of staying up at night, playing recreational video games, and falling asleep in reading class. He shares an Xbox and Nintendo Switch with his brother at home. Enrique does not have any behavioral problems in class.

Fernando

Fernando is 11 years old and Enrique's twin brother. He reads, writes, and speaks English, and while he is not in special education, he is diagnosed with dyslexia. His fall MAP score was 179, seventh percentile, and his winter MAP score was 172, first percentile. He did not meet the fourth-grade STAAR requirements and currently reads at

a beginning reading level. His mother cannot always help him with his homework or ensure he completes his reading assignments.

Fernando struggles the most with decoding, fluency, and comprehension. He is not a motivated reader. The reading teacher has difficulty getting him to complete assignments in class, despite his mandated reading accommodations allowing him to have shorter reading passages and less work. Fernando quickly loses focus during independent work and does not stay on task. Like his brother, he regularly falls asleep in reading class from staying up late at night playing recreational video games. He shares an Xbox and Nintendo Switch with his brother. He does not have any known or observable behavioral problems. From the reading teacher's observations, Fernando is uninterested in reading and learning and does not like being at school.

Julio

Julio is 10 years old and lives with his mother and stepdad. He has involved parents who consistently monitor his progress and track his reading, even on the weekends. He reads, writes, speaks English, and is not in special education. His fall MAP score was 190, twentieth percentile, and his winter MAP score was 196, twenty-second percentile. He did not meet the fourth-grade STAAR requirements and currently reads at a fourth-grade reading level. His mother was the only parent of the participants who had initial reservations about allowing him to participate in this study, fearing it would negatively affect his reading and the quality of tutoring he received. She wanted reassurance from the reading teacher that he was not only going to be playing video games during the intervention.

Julio's reading accuracy is exceptionally high at 99 percent, and he self-corrects when realizing he made a mistake. His efforts to read each word correctly cause him to read slowly. He has poor reading comprehension. Irrespective of his shortcomings, Julio always keeps a book or two on him and enjoys reading. He prefers books containing male protagonists. Julio does not get any reading accommodations in class. He does well if the reading teacher puts him in a small group and helps him stay on track. Despite his current challenges, he tries to improve his reading comprehension and wants to do well in class. Julio did not disclose if he had access to a video game system at home. Unlike the other participants, Julio enjoys reading actual books over electronic books. He does not have any behavioral issues.

Theodore

Theodore is 10 years old and lives with his dad and stepmom. His parents make sure he completes his homework daily. Theodore identifies as white and is the only non-Hispanic participant in the group. He reads, writes, and speaks English and is not in a special education program. In the fall, his MAP score was 192, within the twenty-fourth percentile, and in the winter, it was 197, within the twenty-fourth percentile. He did not meet the four-grade STAAR requirements and currently reads at a fourth-grade reading level. Theodore has the highest fluency and accuracy in the group but has low comprehension. He rushes through reading assignments and does not retain what he reads.

Theodore reads well with expression and punctuation and enjoys reading non-fiction books, such as Harry Potter and other books featuring male protagonists. He does not like reading aloud in class, does well reading aloud in small groups, and has issues

staying on track when working independently. His parents let him play recreational video games after school on weekdays once he has finished his homework and chores. The reading teacher did not know which type of video game console Theodore had at home. Theodore has behavioral issues in some of his classes and with some of his classmates.

Reading Teacher

The reading teacher holds a Bachelor of Arts in Social Sciences and is pursuing a Master of Education in Curriculum and Instruction, with a concentration in Reading and Literacy, from a private university in Texas. She has a standard certification as a fourth-through-eighth grade generalist, with supplemental certification in teaching English as a Second Language students and has taught elementary students for over 10 years. She is a master reading teacher, was the 2017 Teacher of the Year at her school, and receives educational training annually from her school and district.

Intervention

The researcher implemented a six-week-long reading intervention program at an elementary school in Texas. The program began on January 18, ended on February 22, 2022, and consisted of three phases: 1) Initial Assessment, 2) Intervention, and 3) End of Study. The participants participated in six sessions. Each session occurred from 3:45 pm to 4:45 pm on Tuesdays in the reading classroom. This section includes the following subsections: (a) To the Moon, (b) Initial Assessment, (c) Intervention, and (d) End of Study.

To the Moon

The researcher used the search criteria in Table 3.2 to identify an appropriate recreational video game for this study. To the Moon was the only reading-intensive recreational video game matching the search criteria. Freebird Games released To the Moon on November 1, 2011 (XenForo, 2016; Allen, 2018). It is a single-player, role-playing video game containing psychological drama and adventure (Freebird Games, 2021; Webster, 201; Gao, 2018). It supports Microsoft Windows, MAC OS X, Linux, Android, iOS, and Nintendo Switch. People can download it at several digital distribution websites and application stores, including STEAM and the Google Play application store (Rudd, 2014; Valve Corporation, 2020; XenForo, 2016). To the Moon received several awards for its narrative, music, thematic material, and emotional power (Donovan, 2012). Some of these awards included the GameSpot 2011 Best Story, Best Music, Most Memorable Moment, Best Writing and Dialogue, Best Ending, and Song of the Year awards (Gallegos, 2011; CBS Interactive, Inc, 2012a; CBS Interactive, Inc, 2012b; CBS Interactive, Inc, 2012c; CBS Interactive, Inc., 2012d). GamesRadar even listed To the Moon on its 100 video games of all times list in 2015 (Allen, 2018).

Table 3.2

Video Game Selection Criteria

Selection Criteria
<ul style="list-style-type: none">• Recreational video game• Adventurous• Action-oriented• Quality graphics• Active storyline with reasonable reading• Does not require training or gaming experience to play• Free of charge• Browser-based or uses an application• Saves player's place in the game

-
- Does not have banner or ads
 - Uses Google Account or a username and password
 - Appropriate for 10- and 11-year-old students
 - Morally, ethically, and culturally appropriate for K-12 settings
 - Compatible with a Google Chromebook
-

In *To the Moon*, players serve as Doctor Eva Rosalene and Doctor Neil Watts. Both characters are scientists, work for Sigmund Corp, and use technology on perishing patients to create artificial memories as part of a “wish fulfillment service.” Players must invest themselves in the video game’s narrative-rich storyline, reading near-constant commentary from the various characters in the game. They must also explore the main character's memories, known as Johnny Wyles, find and collect objects in the game referred to as “mementos,” solve puzzles, interpret information about Johnny’s life, and traverse back into his memory. The overall goal of *To the Moon* is to manipulate Johnny’s memory and fulfill his final wish of going to the moon.

The researcher and his fifth-grade daughter played *To the Moon* on an iPad and Google Chromebook months before the study. The researcher deliberately played the game for 30-minute sessions while taking detailed notes. He wrote down words he determined would challenge fifth-grade students and main points about the storyline during each session, including characters' names, involvement in the game, and information the reading teacher and he could use in the formative assessments. His fifth-grade daughter played *To the Moon* for 20 minutes once weekly. After each gameplay session, the researcher asked her questions about her experience, the game’s storyline, and potentially challenging vocabulary words. He took notes during these discussions. Her gameplay sessions and contributions confirmed the relevance and appropriateness of this video game for the reading intervention program. Additionally, her participation

determined where the participants would reach in the game during each gameplay session and specific parts of the game where they would need assistance from the reading teacher.

Initial Assessment

For the first 10 minutes of week one, the reading teacher assigned participants to specific seats within the reading classroom and gave them instructions. They logged onto Eduphoria and accessed the pretest using their Google Chromebooks. She implemented the same testing conditions used on the STAAR. These included ensuring participants did not talk in class, did not make unnecessary and distracting noises, and did not look at each other's computer screens. Participants had 30 minutes to read two passages and answer ten questions derived from the 2018 STAAR. These questions aligned with 11 TEKS. See Appendix C for the pretest. See Appendix L for additional information on the TEKS. The test results automatically populated in Eduphoria once the participants finished. The reading teacher used the remaining 20 minutes to review the pretest with the participants. The researcher and the reading teacher used the test's results to create the mini-lessons and formative assessments.

Intervention

The sequence for weeks two through five was the same. The reading teacher used the first 20 minutes to facilitate a mini-lesson on reading strategies associated with the questions the participants missed on the pretest. She focused on reading strategies for fictional text on weeks two and three and non-fiction text on weeks four and five. The participants practiced these strategies as guided practice. They logged onto their Google Chromebooks, accessed To the Moon, and played the game for 20 minutes. When they

finished, the participants saved their place in the game. They spent the last 20 minutes on the formative assessment. The reading teacher provided each participant with a paper version of the assessment, read each question-and-answer option, and gave them a minute to select the correct answer. These assessments provided the participants additional practice applying the reading strategies they reviewed in class, using information from the video game (Fenty et al., 2015). She reviewed the formative assessment with the group and answered their questions once they finished.

End of Study

For the first five minutes of the sixth week, the participants accessed the posttest in Eduphoria and received specific instructions from the reading teacher. See Appendix D for the posttest. The posttest consisted of two reading passages and ten questions from the 2019 STAAR and aligned with 11 TEKS. The participants had 30 minutes to complete the test. Once they finished, the reading teacher used the remaining 25 minutes to conduct the Student Focus Group Interview. See Appendix I for the Student Focus Group Interview Protocol. She recorded the interview using a voice recorder and took notes. She had the participants complete the Student Attitudes Survey the following day during reading class. This survey included a quantitative and qualitative portion. See Appendix J for the survey.

Data Collection

The researcher used six data sources in this study: (a) Pretest, (b) Formative assessments, (c) Posttest, (d) Student Focus Group Interview, and (e) Student Attitudes Survey, and (f) Debriefs. Table 3.3 illustrates how these data sources aligned with and answered the research questions. The researcher obtained permission to conduct this

study and use these data sources from the elementary school, their district, and the University of South Carolina’s Institutional Review Board (IRB) (see Appendix A and B). This section discusses each of these data sources.

Table 3.3

Research Questions and Data Sources

Research Questions	Data Sources
Research Question 1: How and to what extent does a recreational video game affect fifth-grade boys' reading comprehension performance?	<ul style="list-style-type: none"> • Pretest • Formative Assessments • Posttest • Student Focus Group Interview • Debriefs
Research Question 2: What are the fifth-grade boys' experiences when playing a recreational video game to improve their reading comprehension performance?	<ul style="list-style-type: none"> • Student Focus Group Interview • Student Attitudes Survey • Debriefs

Pretest and Posttest

The pretest and posttest determined whether there were any changes in the fifth-grade boys' reading comprehension performance after completing the six-week-long reading intervention program. Participants completed the pretest on week one and the posttest on week six. They had 30 minutes to complete each test. Table 3.4 contains the 11 reading TEKS tested on the pretest and posttest and their frequency. Appendix L contains additional information on these TEKS. On the pretest, participants read “A Winning Day,” answered five questions, and followed the same sequence for “Flying Lessons for Big Bird.” The researcher obtained both passages and questions from the 2018 STAAR. See Table 3.5 for the composition of the pretest.

Table 3.4*Texas Essential Knowledge and Skills Used in the Pretest and Posttest*

TEKS	Category	Description	Frequency
5.3(B)	Vocabulary	Use context within and beyond a sentence to determine the relevant meaning of unfamiliar words or multiple-meaning words.	1
5.6(E)	Comprehension	Make connections to personal experiences, ideas in other texts, and society.	1
5.6(F)	Comprehension	Make inferences and use evidence to support understanding.	2
5.6(H)	Comprehension	Synthesize information to create a new understanding.	1
5.7(C)	Response Skills	Use text evidence to support an appropriate response.	2
5.7(D)	Response Skills	Retell, paraphrase, or summarize texts in ways that maintain the meaning and logical order.	2
5.8(B)	Literary Elements	Analyze the relationships and conflicts among the characters.	1
5.8(C)	Literary Elements	Analyze plot elements, including rising action, climax, falling action, and resolution.	1
5.9(D) (i)	Genres	[Recognize] the central idea with supporting evidence.	1
5.9(D) (iii)	Genres	[Recognize] organizational patterns such as logical order and order of importance.	1
5.10(A)	Author's Purpose	Explain the author's purpose and message within a text.	1

Table 3.5*Pretest Composition from the 2018 STAAR*

Pretest Question	STAAR Passage	STAAR Question	TEKS
1	1	3	5.8(B)
2	1	2	5.3(B)

3	1	7	5.7(D)
4	1	6	5.6(F) & 5.7(C)
5	1	1	5.8(C)
6	5	31	5.6(F) & 5.7(C)
7	5	37	5.7(D) & 5.9(D) (i)
8	5	32	5.9(D) (iii)
9	5	33	5.10(A)
10	5	38	5.6(E) & 5.6(H)

For the posttest, students read "Playing the Field," answered five questions, and did the same for "Winter Counts." Table 3.6 includes the posttest question numbers, passages, and the questions derived from the 2019 STAAR and their corresponding TEKS. The reading teacher administered each test according to the STAAR testing protocol. The Texas Education Agency validated both tests. Both tests helped answer research question one.

Table 3.6

Posttest Composition from the 2019 STAAR

Posttest Question	STAAR Passage	STAAR Question	TEKS
1	1	1	5.8(B)
2	1	2	5.3(B)
3	1	3	5.7(D)
4	1	4	5.6(F) & 5.7(C)
5	1	5	5.8(C)
6	4	24	5.6(F) & 5.7(C)
7	4	26	5.7(D) & 5.9(D) (i)
8	4	27	5.9(D) (iii)
9	4	29	5.10(A)
10	4	30	5.6(E) & 5.6(H)

Formative Assessments

The formative assessments provided participants with additional practice, reinforced what they learned in class, and were used to determine any changes in their performance throughout the reading intervention program. Participants completed a formative assessment on weeks two through five after each gameplay session. Formative assessments focused on the questions and associated TEKS the participants' missed on the pretest and included information from *To the Moon*. The researcher and reading teacher created these assessments on week one.

The reading teacher gave participants a hard copy version of each assessment to maximize the allotted time in class. For the first 10 minutes, she read each question and corresponding answer choices aloud and gave participants a minute to select the correct answer using a pencil. The reading teacher used the remaining 10 minutes to review each question with the participants and answer any of their questions. She graded each assessment at the end of the session, inputted the scores into a Microsoft Excel spreadsheet, and uploaded the document onto her school's Google Drive, where the researcher accessed and used the data.

Student Focus Group Interview

The primary purpose of the Student Focus Group Interview was to help the researcher determine how and to what extent the recreational video game affected the participants' reading comprehension performance. The reading teacher conducted the Student Focus Group Interview with participants after the posttest on the sixth week. As stated in Creswell (2014), this type of qualitative data collection instrument is valuable in answering research questions, enhancing and understanding quantitative data, and

determining the effectiveness of a study. The Student Focus Group Interview strengthened the pretest and posttest and Student Attitudes Survey results and helped answer research questions one and two.

Mertler (2019) found that focus group interviews can make people, including children, feel more comfortable discussing topics and be information-rich because of people's natural tendency to feed off one another's contributions. Focus group interviews stimulate participants' recollection as they share similar experiences, identities, and understanding (Tracy, 2020). When conducting the Student Focus Group Interview, the reading teacher applied the principles discussed in Creswell (2014) by asking participants the open-ended questions in Table 3.7. She ensured all participants spoke and shared their perspectives freely while taking notes and using a voice recorder to capture the interview verbatim (Mertler, 2019). The interview lasted 25 minutes. The researcher used REV, a voice-to-text service, to transcribe the interview in Microsoft Word. Table 3.7 shows how the Student Focus Group Interview questions align to research questions one and two.

Table 3.7

Student Focus Group Interview Protocol

Research Question	Interview Questions
RQ1: How and to what extent does a recreational video game affect fifth-grade boys' reading comprehension performance?	<p>1. Can you share a time when you asked questions about the commentary while playing the game to accomplish a task?</p> <p>1.a. How did this deepen your understanding of the storyline, characters, and game?</p> <p>2. Can you give me an example or two when you were required to make correct predictions using the commentary in the game?</p>

	<p>2.a. Is this like what you usually do in class?</p> <p>2.b. How was it different?</p> <p>3. Did any of you create mental images of the steps you would take in the game given the text you received?</p> <p>4. Can you give me an example or two of when you had to reread passages, use background knowledge, and ask yourself questions about the commentary in the game to accomplish a particular task or level up?</p> <p>5. Were you able to connect the game to your personal experiences, ideas in other texts, and society?</p> <p>6. Give me examples of when you had to make inferences in the video game?</p> <p>6.a. How was this process similar or different from what you learned in class?</p> <p>7. How did the game require you to evaluate important details?</p> <p>8. How often did you come across words you did not know or could not pronounce?</p> <p>8.a. What did you do in these situations?</p> <p>8.b. How many of you applied the same reading principles your other teachers and I taught you?</p>
<p>RQ2: What are the fifth-grade boys' experiences when playing a recreational video game to improve their reading comprehension performance?</p>	<p>1. What are your thoughts on using the video game's storyline, including its characters, like a book in the guided practices and formative assessments?</p> <p>2. Were you more motivated about attending tutoring knowing you would be playing a video game?</p> <p>3. Would you recommend To the Moon to a friend?</p>

4. Would you like to play another video game?

Student Attitudes Survey

The researcher used the Student Attitudes Survey to understand the participants' attitudes on using a recreational video game to enhance their reading abilities and improve their reading comprehension performance. The survey contained 15 items and five open-ended questions. Surveys measure people's attitudes, perceptions, or behaviors, produce quantitative data, and may include a Likert-type scale (Mertler, 2019; Pegram, 2016; Petner, 2018). Participants completed the Student Attitudes Survey online on week six in the fifth-grade classroom during normal reading class, using their Google Chromebooks. The reading teacher administered this survey to four participants in the morning and the remaining two later that day. She used a voice recorder to capture the qualitative portion of the survey during each occasion. The researcher used Microsoft Excel to prepare and analyze the 15 survey items and REV to transcribe the qualitative portion into a Microsoft Word document.

The researcher used a modified version of the Attitudes Towards the Usage of Educational Video Games Questionnaire in Appendix J by Marti-Parreno et al. (2018) for the quantitative portion of the survey. The questionnaire initially contained five scales: 1) Attitude, 2) Relevance, 3) Confidence, 4) Media affinity, and 5) Self-efficacy, containing 21 items. Marti-Parreno et al. (2018) created the survey for undergraduate students. The researcher used the first four scales of the questionnaire to create the Student Attitudes Survey, comprising 15 items, and tailored each item for 10- and 11-year-old boys. There were two items in the Attitude scale, six items in the Relevance scale, four items in the Media affinity scale, and seven items in the Self-efficacy scale.

Items used five-point Likert Scales, where (1) represented strongly disagree and (5) strongly agree.

The five open-ended questions in this survey focused on the participants' experiences participating in the study using *To the Moon* as a book, completing the various assessments, and playing recreational video games. Questions included: “How did you feel about participating in this study knowing you would be playing a video game?” “What are your thoughts on using *To the Moon* as a book in this reading intervention program, including in the formative assessments?” and “What video game would you have picked for this study?” The reading teacher treated this portion of the survey as a semi-structured interview, using these questions as a guide to get the participants talking. The uniqueness of this survey, containing both quantitative and qualitative data, provided the researcher with a more balanced and holistic perspective of the participants' attitudes and experiences using recreational video games to improve their reading comprehension. He merged and analyzed this data with the Student Focus Group Interview data. See Appendix J for the Student Attitudes Survey. The researcher used this survey to answer research question two.

Debriefs

The debriefs served as informal synchronization meetings between the researcher and reading teacher to discuss the events for that week or following week, special instructions, the participants, and key observations. They occurred as needed. The researcher and reading teacher scheduled each by email, text, or phone. These meetings often occurred in Zoom, were not structured, and lasted 30 minutes to an hour. There were occasions when the researcher and reading teacher shared updates by email, phone,

or the elementary school's Google Drive. Maintained in this drive was the reading teacher's notes containing key points for that week's reading session, such as details on why a participant missed a reading session, if a participant experienced technical issues with To the Moon or his Google Chromebook, and what she observed or did during the gameplay sessions. In addition, the researcher and reading teacher conducted a debrief in person two days before the final session on week six and several more once the study finished. These debriefs synchronized the researcher and reading teacher's efforts, provided the researcher with valuable insight and perspective he would not have obtained otherwise, and enhanced and clarified the findings and helped the researcher answer both research questions.

Data Analysis

The researcher used a mixed-methods design to answer the two research questions in Table 3.8. He obtained quantitative data from the pretest, formative assessments, posttest, and Student Attitudes Survey, and qualitative data from the Student Focus Group Interview, Student Attitudes Survey, and Debriefs. Qualitative data supported and enhanced his quantitative findings.

Table 3.8

Research Questions, Data Sources, and Methods of Analysis

Research Questions	Data Sources	Methods of Analysis
Research 1: How and to what extent does a recreational video game affect fifth-grade boys' reading comprehension performance?	<ul style="list-style-type: none"> • Pretest • Formative Assessments • Posttest • Student Focus Group Interview • Debriefs 	<ul style="list-style-type: none"> • Descriptive Statistics • Inductive Analysis

Research Question 2: What are the fifth-grade boys' experiences when playing a recreational video game to improve their reading comprehension performance?	<ul style="list-style-type: none"> • Student Focus Group Interview • Student Attitudes Survey • Debriefs 	<ul style="list-style-type: none"> • Inductive Analysis • Descriptive Statistics
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Quantitative Data Analysis

The researcher used Microsoft Excel to record descriptive statistics (mean and standard deviation) of his quantitative data, comprising the pretest, formative assessments, posttest, and part one of the Student Attitudes Survey. Descriptive statistics summarize the data, show potential patterns, and allow researchers to interpret it in meaningful ways (Lund Research, 2018). This data analysis method allowed the researcher to analyze his quantitative data sources and answer research questions one and two. Chapter four contains the descriptive statistics for all four quantitative data collection instruments.

Qualitative Data Analysis

The researcher used inductive analysis to analyze his qualitative data, comprising the Student Focus Group Interview, Student Attitudes Survey, and Debriefs. The qualitative results explained and strengthened the quantitative findings and helped answer his research questions. Once the researcher collected the qualitative data, he listened to the audio recordings several times to get familiar with the data. He ensured the teacher did not accidentally capture participants' personally identifiable information. He began writing analytic memos while listening to these interviews and reflecting on the participants' responses. The researcher used REV to transcribe the interviews verbatim. Once finished, he compared the transcriptions to the voice recordings, made the necessary adjustments for accuracy, and then sent them to the reading teacher for member

checking and refinement. Given his small sample size, the researcher merged the Student Focus Interview data with the Student Attitudes Survey data and analyzed them.

The researcher conducted two coding cycles when analyzing his qualitative data. In the first coding cycle, he uploaded the consolidated transcript to Delve, an online tool used to analyze qualitative data, and used in vivo (verbatim) coding and initial coding to analyze and assign codes to each sentence. The researcher conducted several iterations of this process and continually refined assigned codes. Refinement consisted of merging and renaming codes. He then transitioned to code mapping to create initial categories, audited his process, and prepared to transition from the first to the second coding cycle. After this process, the researcher met with his dissertation advisor, discussed his first cycle of coding data, and then made the necessary changes. He transitioned to the second coding cycle using pattern coding, where he refined and more accurately labeled his categories. Themes surfaced during this phase. The researcher aligned categories to applicable themes and refined each. He met with his dissertation advisor for a final debriefing, discussed his second coding cycle, and made the necessary changes based on her recommendations.

Procedures and Timeline

Three phases comprised this study captured in Table 3.9: (a) Administrative, (b) Data Collection, and (c) Data Analysis. This section addresses each phase.

Table 3.9*Phases and Details of the Study*

Phase	Activity	Weeks
Phase 1	<ul style="list-style-type: none"> • Data collection instruments created. • District approval to conduct study received. • U of SC IRB approval received. • Participants identified and notified. • Parental consent received. • Ascent from participants received. 	12
Phase 2	<ul style="list-style-type: none"> • Participants completed and reviewed pretest. • Formative assessments created. • Participants received mini-lessons, participated in guided practices, conducted gameplay sessions, and completed and reviewed formative assessments. • Participants completed posttest, Student Focus Group Interview, and Student Attitudes Survey. 	6
Phase 3	<ul style="list-style-type: none"> • Quantitative and qualitative data prepared. • Descriptive statistics conducted. • Inductive analysis conducted. • Analysis and findings captured in Chapter 4. • Dissertation Advisor reviewed Chapter 4. • Chapter 4 updated. 	10

Phase 1 – Administrative

In October 2021, the researcher finalized his plan for this study, including all data collection instruments, and then received district approval to conduct the study at the elementary school. The approval process took two months. In December 2021, he completed his proposal defense with his dissertation committee and received approval to proceed with the study from the University of South Carolina’s IRB. During the holiday break, the reading teacher identified fifth-grade boys requiring mandatory tutoring in Spring 2022 per her district’s policies. Six boys needed tutoring. She met with the

participants and their parents or guardians, discussed the study, and received their verbal consent. Parents or guardians only had to sign the consent form if they did not want their child to participate in the study. Participants gave the teacher their verbal permission, did not have to sign any documentation, and could quit the study without repercussion. See Appendix K for the Consent Form.

Phase 2 – Data Collection

The reading teacher started the six-week-long reading intervention on January 18 and finished it on February 22, 2022. Participants took the pretest on January 18. The reading teacher graded it, inputted the scores into a Microsoft Excel document, and then uploaded the file to a shareable folder on her school's Google Drive. The researcher and reading teacher met virtually, discussed the scores, and determined which TEKS they would use on the formative assessments. See Appendix L for more information on these TEKS. The researcher created the formative assessments and had the reading teacher review and approve each. The participants completed Formative Assessment One on January 25, Formative Assessment Two on February 1, Formative Assessment Three on February 8, and Formative Assessment Four on February 15. Like the pretest, the reading teacher graded each assessment, inputted each score into a Microsoft Excel document, and uploaded it onto the designated Google Drive.

Participants completed the posttest and participated in the Student Focus Group Interview on February 22. The reading teacher used a recording device to capture the interview verbatim. She uploaded the file to her work-issued computer, graded the posttest, and uploaded both files to her school's Google Drive. The following day, the reading teacher met with four participants in the morning during regular reading class and

the other two in the afternoon and had them take the Student Attitudes Survey online using their Google Chromebooks. Subsequently, she asked both groups open-ended questions about their attitudes and experiences using a recreational video game to improve their reading comprehension performance. She captured the interview, uploaded the audio file to her school's Google Drive, and notified the researcher, who downloaded the file and obtained the survey results from Google Forms.

Phase 3 – Data Analysis

The researcher began preparing his data for analysis on February 24. He used Microsoft Excel to prepare the quantitative data. He used REV, a transcription service, to transcribe the Student Focus Group Interview and qualitative data from the Student Attitudes Survey. He re-listened to the audio recordings while reviewing each transcript several times, making the necessary edits, sent them to the reading teacher for member checking, and merged them into a single Word document. The researcher added the file to Delve, an online qualitative analysis tool, analyzed his data and captured his qualitative findings. Using Microsoft Excel, he conducted descriptive statistics on his quantitative data and captured his findings. The researcher met with his dissertation advisor several times to review, discuss, and update his findings. He finished Chapter 4 on May 1.

Rigor and Trustworthiness

The researcher used triangulation, thick, rich descriptions, an audit trail, and peer debriefings to achieve rigor and trustworthiness.

Triangulation

As Melrose (2001) and Murphy and Yelder (2010) described, triangulation uses at least three different methods, sources, or researchers to confirm inferences, themes, or patterns. Researchers use this process “to overcome any inherent weakness or bias of a single research strategy,” increasing their studies' academic and qualitative rigor (Murphy & Yelder, 2010, p. 65). This study used methodological triangulation, using more than one method to study a problem and obtain complete and accurate data (Bekhet & Zauszniewski, 2012).

The researcher used the pretest and posttest, four formative assessments, a Student Focus Group Interview, and two Student Attitudes Surveys to collect quantitative and qualitative data and attain triangulation. The pretest and posttest collected quantitative data and measured changes in the progress and performance of the participants following the reading intervention program. The researcher used the Student Focus Group Interview to determine if and how participants practiced and applied traditional reading comprehension strategies during gameplay sessions and what they thought about the pretest, posttest, and formative assessments. The Student Attitudes Survey collected quantitative and qualitative data on the participants' attitudes and experiences playing To the Moon and other recreational video games, using To the Moon as a book, and completing the various assessments used in this study. The qualitative data collected from these sources explained and strengthened the quantitative data and analysis and helped comprehensively answer researcher questions one and two.

Thick, Rich Descriptions

Watson (2018) recommends researchers use thick, rich descriptions to describe the research context, structure, assumptions, and processes revealed from the data. Thick, rich descriptions allow readers and researchers to determine whether and to what degree the reported findings transfer to other research settings (Watson, 2018). In addition, they accurately and comprehensively convey the study to the reader and allow them to reproduce it, compare it with other studies, and conduct follow-on research (Shenton, 2004). The specificity in these descriptions makes the results more realistic and richer and adds to the validity of the findings (Creswell, 2014). The researcher used thick, rich descriptions in this study when describing the site, setting, participants, and findings and included sufficient examples.

Audit Trails

Researchers use audit trails to document important theoretical, methodological, and analytical decisions made throughout the research process and capture the evolution of their thinking during the study (Carcary, 2009). Audit trails can increase a study's transparency and trustworthiness and allow researchers to determine "whether research inferences are logical, whether findings are grounded in the data, and whether a study's research process is suitable" for follow-on research (Carcary, 2009, p. 21). The researcher used audit trails when conducting inductive analysis on the Student Focus Group Interview and the qualitative portion of the Student Attitudes Survey data. Using audit trails in this study supported his analysis, findings, and decisions and allowed him to reflect on the participants' perspectives, this study's problem of practice, and grow as a researcher.

Peer Debriefings

In peer debriefing, an individual external to the researchers critically reviews, critiques, and evaluates their research processes, including “data collection, analysis, and interpretation” (Mertler, 2019, p. 143). This process gives researchers another perspective and can improve the research’s rigor and trustworthiness (Mertler, 2019). On three separate occasions, members of the University of South Carolina’s Learning Design and Technologies program conducted peer debriefings of the researcher's chapters one through three to increase the accuracy, rigor, and trustworthiness of the information and the effectiveness of his study (Creswell, 2014). His dissertation advisor worked with him throughout data collection and analysis and conducted peer debriefings of his first and second coding cycles and descriptive statistics. Her efforts challenged his thinking, allowed him to view the data differently, determine the significance of the data, and answer his research questions.

Plan for Sharing and Communicating Findings

The researcher shared his initial findings and recommendations with the participants, their parents or guardians, the reading teacher, the elementary school, and its district. He respected and safeguarded the participants’ privacy and anonymity throughout the study (Creswell, 2014). He accomplished this by not collecting sensitive information, using pseudonyms to describe or mention them, encrypting Microsoft Excel and Word documents, and password-protecting his computer. The researcher will provide the elementary school and district with this dissertation for review and use once the University of South Carolina approves and releases it to the public. The researcher intends to brief the elementary school’s principal, her superintendent, and their staff

members in Fall 2022. In addition, he will present this study at the 2022 Association for Educational Communications and Technology International Convention (AECT) in Las Vegas, Nevada, in October 2022.

CHAPTER 4

ANALYSIS AND FINDINGS

This mixed-methods case study aimed to determine the effectiveness of using a recreational video game to support fifth-grade boys struggling with reading comprehension at an elementary school in Texas. The researcher collected quantitative and qualitative data to answer the following questions: (1) How and to what extent does a recreational video game affect fifth-grade boys' reading comprehension performance? (2) What are the fifth-grade boys' experiences when playing a recreational video game to improve their reading comprehension performance? The researcher collected and analyzed a pretest and posttest, four formative assessments, a Student Focus Group Interview, and two Student Attitudes Surveys to answer these questions. This chapter includes (a) Quantitative findings, (b) Qualitative findings, and (c) Summary.

Quantitative Findings

The researcher used three quantitative data sources in this study. The small sample size ($n = 6$) prevented him from running a reliability analysis on each. The first data source was the pretest and posttest (see Appendix C and D). Both tests contained a fiction and non-fiction passage and 10 questions derived from the 2018 STAAR and 2019 STAAR. Test questions aligned to 11 TEKS that 5th-grade boys at the elementary school often missed on the STAAR (see Appendix L). Participants had 30 minutes to complete each test. They completed the pretest on week one and the posttest on week six.

The researcher used four multiple-choice formative assessments for the second data source (see Appendices E through H). Each participant completed a formative assessment using pens and paper in weeks two through four. The reading teacher read each question aloud to the group. The assessments included five questions mirroring the STAAR questions and TEKS most participants missed on the pretest. These questions incorporated information from *To the Moon's* commentary and storyline. Participants had 10 minutes to complete each assessment.

The third data source was a 15-item Student Attitudes Survey (see Appendix J). The researcher used a modified version of *Students' attitude towards the use of educational video games to develop competencies* by Marti-Parreno et al. (2018) in this study. The original instrument included five scales. The Student Attitudes Survey used four of the five. They included: a) Attitude, b) Relevance, c) Confidence, and d) Media Affinity. On week six, participants had 20 minutes to complete the quantitative portion of the survey online using their Google Chromebooks.

Pretest and Posttest

On week one of the reading intervention program, all six participants completed the 10-question pretest in Eduphoria and reviewed each question with the reading teacher. Eduphoria is software teachers can use to administer and manage assessments. The test required participants to read a grade-level passage, answer five multiple-choice questions, read another similar passage, and answer five more questions. Eduphoria graded the tests once participants finished. The reading teacher entered the test results into a Microsoft Excel document and uploaded them to a designated folder on her school's Google Drive for the researcher. The value per question was 10 points. The

reading teacher selected the passages and questions from the 2018 STAAR for the pretest. Five of the six participants completed the posttest on week six. The test contained the same number of reading passages and questions as the pretest, focused on the same TEKS, and tested these TEKS in the same order (see Appendix L). The reading teacher selected passages and questions from the 2019 STAAR for the posttest.

Descriptive statistics. The mean for the pretest was 40 ($SD = 22.40$), and posttest was 42 ($SD = 13.30$). Table 4.1 contains descriptive statistics of each test per participant. The researcher gave participants pseudonyms, which are consistent throughout this study. Christopher did not take the posttest. The group's performance improved by two points when comparing the pretest and posttest. Significant was three boys improved, and two did not. Alejandro improved by 30 points and had the greatest improvement among the group, Fernando improved by 20 points, and Theodore improved by 10 points. As for Enrique and Julio, both individuals regressed by 10. Enrique had one of the highest pretest scores.

Four key findings emerged from data analysis on the pretest and posttest. The first finding was that all participants correctly answered question two in the posttest. Only one participant missed this question on the pretest. The group did the best on this question related to TEKS 5.3(B), measuring their ability to use context within and beyond a sentence to determine the meaning of unfamiliar words (Texas Education Agency, 2018). On the contrary, all participants incorrectly answered question eight on the posttest. One boy regressed while the others continued selecting incorrect answers for a second time. This question supported TEKS 5.9(D) (iii) and tested their ability to recognize organizational patterns in texts from logical order to order of importance

(Texas Education Agency, 2018). Half of the participants correctly answered question nine on the posttest for the third finding. Three boys improved from the pretest, and two selected incorrect answers a second time. Question nine required participants to explain the author's purpose and message (Texas Education Agency, 2018). For the final finding, four of six participants answered question 10 correctly on the pretest, and three of five participants selected the incorrect answer on the posttest, indicating a regression on this question aligned to TEKS 5.6(E) and 5.6(H). The first TEKS tested participants' ability to make connections from the text to their own experiences, ideas from other texts, and society (Texas Education Agency, 2018). The second TEKS required them to synthesize information to create new understanding (Texas Education Agency, 2018).

The participants' performance on questions one, three, four, five, and seven did not change significantly from the pretest to the posttest. More than half the participants selected incorrect answers on questions one, three, and four a second time. Meanwhile, half of the group selected the correct answer on questions five through seven a second time. Moreover, the passages for questions one through five were fiction, and questions six through 10 were nonfiction. There were no significant changes between the two on the pretest. However, participants scored slightly higher on questions specific to fictional passages on the posttest.

Table 4.1*Descriptive Statistics of the Pretest and Posttest*

	Alejandro		Christopher		Enrique		Fernando		Julio		Theodore		Mean		SD	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Q1	0	10	0	-	0	10	10	0	0	0	0	0	16.7	40	37.3	49.0
Q2	10	10	10	-	10	10	0	10	10	10	10	10	83.3	100	37.3	0.00
Q3	0	0	10	-	0	0	0	10	0	0	10	0	33.3	20	47.1	40.0
Q4	0	0	10	-	10	10	0	0	0	0	0	0	33.3	20	47.1	40.0
Q5	0	0	10	-	10	0	0	10	0	10	10	10	50	60	50.0	49.0
Q6	0	0	0	-	10	0	10	10	10	0	0	10	50	40	50.0	49.0
Q7	0	10	10	-	10	10	0	0	0	0	0	0	33.3	40	47.1	49.0
Q8	0	0	0	-	10	0	0	0	0	0	0	0	16.7	0	37.3	0.00
Q9	0	10	10	-	0	10	0	0	0	0	0	10	16.7	60	37.3	49.0
Q10	0	0	10	-	10	10	10	10	10	0	0	0	66.7	40	47.1	49.0
Total	10	40	70	-	70	60	30	50	30	20	30	40	40	42	49.0	49.4

Note. Q = Question

Formative Assessments

The participants completed a formative assessment on weeks two through five after each session. The researcher had his fifth-grade daughter play *To the Moon* for four 20-minute sessions when designing each assessment. She continued where she left off each week. He determined which point the participants would likely reach in the game during each gameplay session through her contributions. The researcher then played the video game, getting to where his daughter left off during each session while taking extensive notes and capturing essential commentary verbatim from the game. He also watched several videos on YouTube of people playing *To the Moon* to validate and enhance his notes, as players cannot go backward in the game.

The overarching goal of the formative assessments was to give participants additional opportunities to apply the reading strategies they reviewed and practiced during the mini-lessons and guided practices. The reading teacher had 20 minutes for the mini-lesson and guided practice, 20 minutes for the gameplay session, and 20 minutes to administer and review the formative assessment each week. Each formative assessment contained five multiple-choice questions, focused on seven TEKS, and tested in the following order: (1) 5.8(B), (2) 5.6(F) and 5.7(C), (3) 5.7(D) and 5.9(D) (i), (4) 5.9(D) (iii), and (5) 5.10(A) (see Appendix E through H). The value for each question was 20 points. Since this study sought to use *To the Moon* as a book, formative assessment questions centered on the game's narrative and characters and incorporated written segments verbatim. Formative assessment questions mirrored STAAR questions identically but did not require participants to read large text passages beforehand, given time limitations. Therefore, participants had to remember what they read during

gameplay sessions. Time limitations were another reason the reading teacher provided participants with printed assessments, read the questions and the answer choices aloud, and had the participants select answers using a pencil. The researcher and reading teacher reviewed, discussed, and modified each formative assessment in advance.

Descriptive statistics. Table 4.2 contains the mean and standard deviation of the formative assessments. The means were 26.70 ($SD = 18.90$) for Formative Assessment 1, 43.33 ($SD = 26.90$) for Formative Assessment 2, 28 ($SD = 16.00$) for Formative Assessment 3, and 15 ($SD = 16.60$) for Formative Assessment 4.

Table 4.2

Descriptive Statistics of the Formative Assessments

	N	<i>M</i>	<i>SD</i>
Formative Assessment 1	6	26.70	18.90
Formative Assessment 2	6	43.33	26.90
Formative Assessment 3	5	28	16.00
Formative Assessment 4	4	15	16.60

The participants scored the highest on formative assessment 2 ($M = 43.33$, $SD = 26.90$) compared to all four assessments. Based on the averages of all four assessments, Enrique and Julio had the highest averages in the group, whereas Christopher failed to answer all the questions on the first two assessments. He did not complete formative assessments three and four. More than half of the six participants increased their scores from formative assessment 1 to 2. These four individuals improved by an average of 30 points. Both Julio and Theodore increased by 40 points on formative assessment two, the highest increase in the group. Alejandro's score decreased by 20 points from formative assessment one to two.

More than half of the group's scores decreased from formative assessment 2 to 3, with an average decrease of 40 points. Enrique, who had the highest scores on formative assessments 1 and 2, missed every question on formative assessment 3, an 80-point decrease from formative assessment 2. The scores between formative assessments 2 and 3 remained the same for Alejandro and Enrique. Despite the group's decline in scores, Fernando, Julio, and Theodore scored 20 points higher on formative assessment 3 than on formative assessment 1. As for the final assessment, half the group's scores decreased from formative assessment 3 to 4. The average for those with lower scores was 40 points. Fernando and Theodore both missed every question on formative assessment 4. Alejandro did not take this assessment. Enrique was the only boy in the group whose performance improved by 20 points. Julio's performance remained the same from formative assessment 3 to 4.

As shown in Table 4.3, participants scored the highest on question two on all four assessments. Question two measured TEKS 5.6(F) and 5.7(C) and tested participants' inferential comprehension. Participants scored the second highest on questions one and three. Question one aligned to TEKS 5.8(B). For this TEKS, participants had to analyze the relevancy and conflict among characters. Question three tested participants on TEKS 5.7(D) and 5.9(D) (i), requiring them to retell, paraphrase, or summarize texts and recognize central ideas with supporting evidence. Participants performed lower on question four than on questions one and three. This question supported TEKS 5.9(D) (iii), measuring their abilities to recognize organizational patterns. Almost every boy missed question five on each assessment. Question five supported TEKS 5.10(A). Participants had to explain the author's purpose and message within the text.

Table 4.3*Formative Assessment Scores Per Question*

	Alejandro				Christopher				Enrique				Fernando				Julio				Theodore			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Q1	0	0	0	-	0	0	-	-	20	20	0	0	20	20	0	0	20	20	0	0	0	20	0	0
Q2	20	20	20	-	0	0	-	-	20	20	0	0	0	0	20	0	0	20	0	0	0	20	20	0
Q3	0	0	0	-	0	0	-	-	0	20	0	20	0	0	0	0	0	20	20	20	0	20	20	0
Q4	0	0	0	-	0	0	-	-	20	20	0	0	0	20	20	0	0	0	20	20	0	0	0	0
Q5	20	0	0	-	0	0	-	-	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0
Σ	40	20	20	-	0	0	-	-	60	80	0	20	20	40	40	0	20	60	40	40	20	60	40	0

Note. Q = Question.

Student Attitudes Survey

Participants completed the modified version of the Marti-Parreno et al. (2018) *Students' attitude towards the use of educational video games to develop competencies* survey on week six. The survey was anonymous. Participants had 15 minutes to complete the 15-question survey electronically using their Google Chromebooks. Since the participants read below grade level, the reading teacher read each question aloud, and the participants marked their choices on the paper individually. As illustrated in Figure 4.1, participants used the emoji mood scale to select the correct rating using the five-point Likert type scale, ranging from one to five. Each number represented the following response: 1) Strongly Agree, 2) Disagree, 3) Neutral, 4) Agree, and 5) Strongly Agree.



Figure 4.1 Emoji Mood Scale

Note. Foster, H. (2020, May 9). *The story behind the scale*. Retrieved June 9, 2022, from <https://fostergram.wordpress.com/2020/04/11/the-story-behind-the-scale/>

Descriptive statistics. Upon completion of the Student Attitudes Survey, the descriptive statistics were calculated on the data using Microsoft Excel. The mean and standard deviation for each subscale is: Attitudes ($M = 4.00$, $SD = 0.71$), Relevance ($M =$

3.61, $SD = 1.06$), Confidence ($M = 3.56$, $SD = 0.90$), and Media Affinity ($M = 3.50$, $SD = 1.50$). The overall mean for the survey was 3.67 ($SD = 0.20$) (see Table 4.4). This section describes the findings for each of these scales.

Table 4.4

Descriptive Statistics of the Student Attitudes Survey

	N	M	SD
Attitude Scale (items 1, 2)	6	4.00	0.71
Relevance Scale (items 3, 4, 5, 6, 7, 8)	6	3.61	1.06
Confidence Scale (items 9, 10, 11)	6	3.56	0.90
Media Affinity Scale (items 12, 13, 14, 15)	6	3.50	1.50
Student Attitudes Survey	6	3.67	0.20

Attitudes Scale. The Attitudes Scale had the highest mean and lowest standard deviation ($M = 4.00$, $SD = 0.71$) among the four scales. Two items comprised this scale. In the first item, six participants liked the idea of using video games to develop their reading abilities. As for item two, three boys strongly agreed to have positive attitudes toward using video games to develop their reading abilities, whereas the other three were indifferent.

Relevance Scale. This scale includes items three through eight and measures participants' beliefs that video games provide educational value (Marti-Parreno et al., 2018). From the data, the participants were impartial to linking video game content to what they have already learned in class and had mixed feelings about being able to connect video game content to their daily experiences. Most of the group believed video game content was valuable, worth learning and could help them develop their reading abilities. Item eight captured an important finding significant to this study. Two boys

believed video games could motivate them to develop their reading abilities. In contrast, two boys were indifferent, and the remaining two strongly disagreed with such a claim.

Confidence Scale. This scale contained items nine through 11 and measured participants' confidence or expectancy for success with using a video game to develop their reading abilities. For item nine, three participants were confident they could develop their reading abilities using video games. One boy was indifferent, and two strongly disagreed. Participants responded similarly to item 10, with half of them confident they could apply what they learned from video game-based reading instruction to their daily lives. The other three were neutral or disagreed. A notable finding in this scale was participant responses in item 11. Five of the six boys agreed that video games could help them learn about reading fundamentals and strategies to improve their reading comprehension. One boy was indifferent.

Media Affinity Scale. Items 12 through 15 measured the importance video games have on the participants' lives. According to Marti-Parreno et al. (2018), researchers use this construct to “assess the attitudes of individuals towards the medium and the contents delivered by the medium” (p.368). This scale had the lowest mean and highest standard deviation ($M = 3.50$, $SD = 1.50$) among the four scales. In item 12, we see that most participants play video games daily. Half of the group said they would miss playing them if they could not, while the other half felt indifferent or disagreed. While most participants played video games frequently, they were either neutral or disagreed that video games were essential to their lives. The results in item 15 were consistent with items 12 and 13. Four of the six participants indicated they could not go for several days

without playing video games. As for the remaining two, one had no bias, and the other strongly disagreed.

Qualitative Findings & Interpretations

The researcher used the Student Focus Group Interview and Student Attitudes Survey to collect qualitative data for answering research questions one and two. On Tuesday, February 22, 2022, the reading teacher conducted the Student Focus Group Interview in her classroom. Five participants participated after completing the posttest. Christopher did not take the posttest or participate in the interview but completed the Student Attitudes Survey the following day. All six participants completed the Student Attitudes Survey during their assigned reading class on Wednesday, February 23. Four boys completed the survey in the morning and the remaining two in the afternoon.

The Student Attitudes Survey had two parts. In the first part, the participants completed a 15-item survey using their Google Chromebooks, and in the second part, they participated in a semi-structured interview. The reading teacher led the morning and afternoon interviews using the open-ended questions in Appendix J to guide the discussion and recorded each. The researcher used the Student Focus Group Interview to determine how and to what extent *To the Moon* affected the participants' reading comprehension performance. He used the Student Attitudes Survey to understand their experiences playing *To the Moon* and recreational video games. Due to this study's small sample size ($N = 6$), the researcher combined the qualitative data from both instruments and analyzed it using inductive analysis.

Participant Interviews

Five participants participated in the Student Focus Group Interview on February 22, 2022, and all six completed both parts of the Student Attitudes Survey that following day. The reading teacher led the Student Focus Group Interview, using the open-ended questions in Appendix I, and recorded the discussion. The interview lasted 25 minutes. She spent the first 35 minutes of this final session administering the posttest and was limited to an hour for this final session, given the elementary school and district's policies for after-school tutoring. The participants completed the two-part Student Attitudes Survey during their assigned reading class while the non-participants worked on independent and group assignments. Alejandro, Christopher, Enrique, and Fernando completed the survey in the morning, and Julio and Theodore in the afternoon. They had 30 minutes to finish the survey. Each part lasted 15 minutes. The reading teacher led the semi-structured interview for part two using the five open-ended questions in Appendix J and recorded the discussion for each group. The researcher transcribed the audio recordings, conducted member checking with the reading teacher, merged all three transcripts into one Microsoft Word document, and analyzed the data using inductive analysis. One hundred forty-one codes emerged after the first coding cycle (see Table 4.5).

Table 4.5

Number of Codes from Qualitative Sources

Qualitative Data Source	Number	Total Number of Codes Applied
Participant Interviews	3	141
Totals	3	141

Analysis of Participant Interviews

The researcher used a deliberate qualitative analysis plan to analyze the participant interviews. Once he obtained the audio recordings from the reading teacher, he listened to them, ensured she did not capture participants' personally identifiable information, and then used REV, a speech-to-text company based in San Francisco, California, and Austin, Texas, to transcribe the interviews verbatim. Once transcribed, he compared the transcripts to the recordings, adjusted the transcripts for accuracy, and highlighted inaudible comments. The researcher followed this process several times before emailing the three transcripts for member checking to the reading teacher, who reviewed and updated the transcripts. Member checking enhanced the accuracy of the transcriptions for analysis.

The researcher merged the transcripts into one Microsoft Word document, read it several times, and wrote analytic memos on the phenomenon under investigation (Saldana, 2021). Saldana (2021) compares analytic memos to researcher journal entries or blogs and describes them as ‘notes to self’ researchers use to think more critically about their data (p. 58). Analytic memos allowed the researcher to see the data differently, question and reflect on the participants’ responses, determine key points and trends that would likely become codes and categories, and validate his first cycle coding methods. Figure 4.2 captures a page from the researcher’s analytic memo. Next, the researcher uploaded the transcription to Delve, an online tool for analyzing qualitative data.

- The boys appear to have mixed feelings about the formative assessments.
- Boys wanted a video game with a lot of action.
- Some of the games they would have used do not contain a lot of reading.
- Boys want to play a video game in class again.
- A boy recommended they play the video game at home for homework.
- Couldn't believe they or at least one boy mentioned playing video games to relieve stress.
- They liked not having to share their device since the game was installed on each Google Chromebook.
- They were happy to have finished the study.
- They liked To The Moon.
- To The Moon was different than video games they have played before.
- They liked the idea of having to find items.
- Many of the boys didn't get very far in the game. Thus the formative assessments may have been more difficult unnecessarily.

Figure 4.2 Page from the Researcher's Analytic Memo

Each sentence in the transcript was analyzed using in vivo and initial coding. In vivo coding allows researchers to give passages a literal code drawn from the words of the participants (Saldana, 2021). Saldana (2021) asserts that in vivo coding captures “the meanings inherent in people’s experience” and can enhance and deepen researchers’

understanding of the phenomena (p. 138). The researcher also used initial coding, as there were several occasions when he could not use in vivo coding, given the way a participant responded to the question or in unique circumstances, including when participants responded with one or two words. Initial coding gave the researcher a starting point by allowing him to determine an appropriate code for specific sentences and reword them as necessary throughout the analysis process (Saldana, 2021). Figure 4.3 captures an occasion when the researcher used in vivo coding and initialing to code a sentence in Delve.

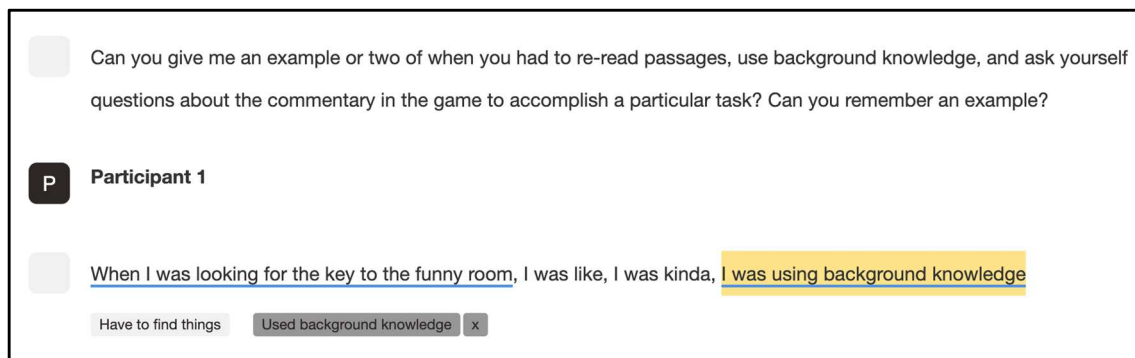


Figure 4.3 In Vivo Coding and Initial Coding in Delve

The researcher created 141 codes after conducting several iterations of in vivo and initial coding. Table 4.6 contains a sample of the codes derived from the first coding cycle. See Appendix M for the complete list of codes. He transitioned into the second coding cycle using code mapping to organize and assemble his codes, create initial categories, and rename and merge codes. The researcher conducted five iterations of this process. Saldana (2021) advises researchers to use code mapping when transitioning from the first to second coding cycle to audit their progress as they rename and merge codes and categorize, recategorize, and conceptualize these codes throughout their

analyses. Using this method can increase the credibility and trustworthiness of one's work (Saldana, 2021).

Table 4.6

Sample of First Coding Cycle Codes

Codes
<ul style="list-style-type: none"> • Had to look for stuff • You can discover new places in To the Moon • Find different characters • Can find different rooms • Finding the funny room • You can find stuff in To the Moon • Can find keys

The researcher used pattern coding to refine and accurately label his categories. Saldana (2021) describes pattern coding as a second cycle method for condensing large amounts of data into smaller, more meaningful analysis units. For example, the researcher identified a pattern with the following codes and categorized them as To the Moon's storyline: 1) Able to recall specific parts of storyline, 2) Liked the storyline, 3) Had an interesting storyline, and 4) Liked knowing what was happening in the game. The researcher used Delve throughout pattern coding. See Figure 4.4 for an example of pattern coding in Delve. The researcher finished pattern coding with five categories and 63 codes. Categories included: 1) Applying reading comprehension strategies during gameplay, 2) Attitudes on the formative and summative assessments, 3) To the Moon as a book, 4) What they liked about video games, and 5) Video games they want to play. Two themes emerged from the participant interviews following pattern coding: a) To the

Moon's effectiveness on reading comprehension performance and b) Boys' attitudes on video games. See Table 4.7 for a sample of the initial themes, categories, and codes and Appendix N for the complete list.

Features of To The Moon (0)
 Write a description or thoughts about this code

Have to find things (12)
 Write a description or thoughts about this code

Cannot go back and reread commentary (2)
 Write a description or thoughts about this code

Can go through game's text fast (1)
 Write a description or thoughts about this code

Figure 4.4 Example of Pattern Coding in Delve

Table 4.7

Sample of the Initial Themes, Categories, and Codes

Themes	Categories
1 – To the Moon's Effectiveness on Reading Comprehension Performance	Applying Reading Comprehension Strategies during Gameplay <ul style="list-style-type: none"> • Had to make correct predictions in the game • Remembered making inferences in the game • Asking questions helped them understand the game more

The researcher conducted a peer debriefing of his first and second coding cycles with his dissertation advisor. They reviewed the five categories and 63 codes in Table 4.7. His advisor recommended he use either phrases or complete sentences but not both

when coding and categorizing the data. She advised him to reread the transcript, reevaluate some of his codes and categories, and define each theme in his own words. From her perspective, the researcher was missing categories, such as “Features of To the Moon” and “Attitudes on using video game in study,” and another theme. The peer debriefing highlighted that his codes, categories, and themes were too broad, specific, or unaligned. The researcher implemented his advisor’s feedback, made the necessary changes, and finalized his analysis. Three themes and nine categories emerged. These themes included: (a) Reading Comprehension Performance, (b) Impressions of To the Moon, and (c) Attitudes toward video games. See Figure 4.5 for more information.

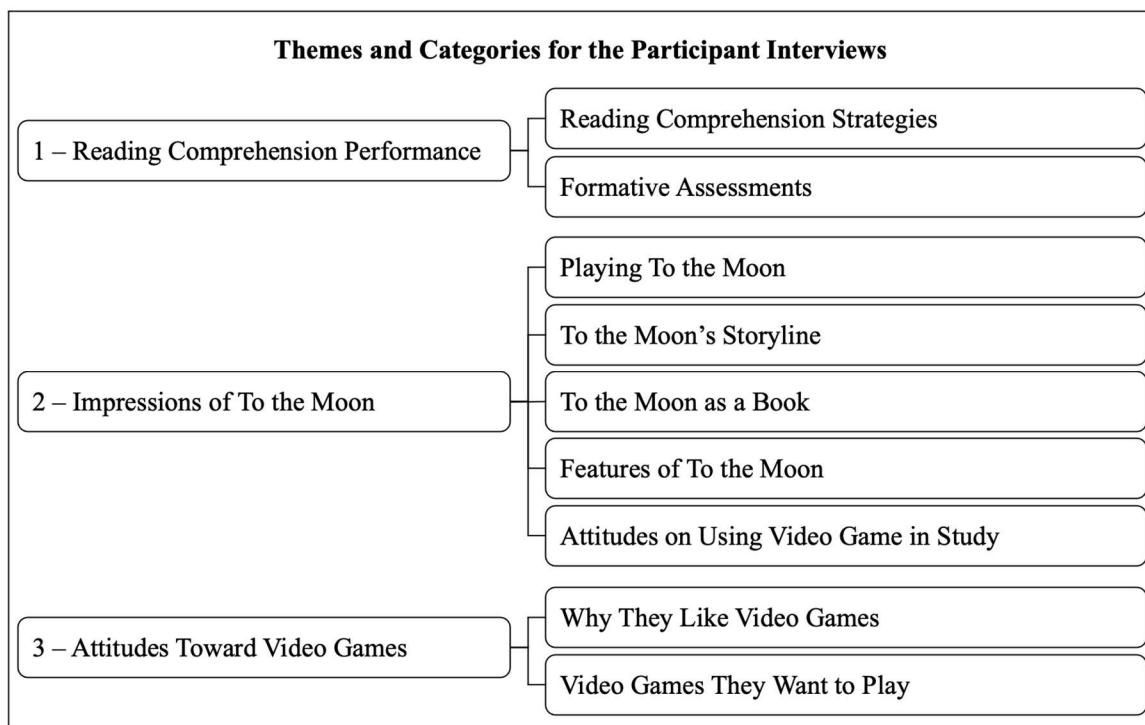


Figure 4.5 Visual Representation of the Three Themes from the Participant Interviews

Theme 1: Reading comprehension performance encapsulates categories *Reading Comprehension Strategies* and *Assessments*. In this study, the participants completed the pretest on week one, received a mini-lesson on reading strategies, participated in a guided

practice, played *To the Moon*, and conducted a formative assessment during each session in weeks two through five, and took the posttest on week six. Both categories are important in understanding how and to what extent recreational video games affect boys struggling with reading comprehension. Based on the data, the participants remembered applying traditional reading comprehension strategies they previously learned or reviewed in the mini-lessons when reading the commentary in *To the Moon*. Second, the formative assessments used information from the video game and mirrored the STAAR questions they missed on the pretest. The participants had mixed feelings about the formative assessments, with many believing they were more challenging and different than both pretest and posttest.

Theme 2: Impressions of *To the Moon* comprises five categories: a) Playing *To the Moon*, b) *To the Moon*'s storyline, c) *To the Moon* as a book, d) Features of *To the Moon*, and e) Attitudes on using video game in the study. These five categories are important in understanding the participants' experiences when playing a recreational video game to improve their reading comprehension performance. According to the data, the participants' impressions of *To the Moon* were positive. They enjoyed using the recreational video game as a book in the reading intervention program, preferring it over actual books, given the game's rich storyline and features. Theme 3: Attitudes toward video games further explore the participants' experiences with recreational video games for improving reading comprehension performance. This theme encompasses two categories: a) Why they like video games and b) Video games they want to play. The participants value video games, believing they offer many benefits, from increasing

participation in class to being fun. Although they enjoyed playing To the Moon, they would have preferred playing a video game with more action if given the option.

Presentation of Findings

The researcher will present the qualitative findings for the participant interviews in the next section, where he explains each of the three themes using verbatim quotes from the participants. The researcher worked with the reading teacher throughout the study. He never received personally identifiable information on the participants, including their names. For this reason, the researcher addresses the participants by their pseudonyms.

Findings from Participant Interviews

Table 4.8 depicts the three themes, key assertions for each, and their associated categories derived from the participant interviews. They include: (a) Reading comprehension performance, (b) Impressions of To the Moon, and (c) Attitudes toward video games.

Table 4.8

Themes, Assertions, and Categories of Participant Interviews

Themes	Assertions	Categories
1. Reading Comprehension Performance	The participants applied traditional reading comprehension strategies when reading the commentary in To the Moon. They had mixed feelings about the formative assessments, with many claiming that they were more challenging than the pretest and posttest.	<ul style="list-style-type: none"> • Reading comprehension strategies • Formative assessments

2. Impressions of To the Moon	The participants enjoyed using To the Moon as a book in the reading intervention program, preferring it over an actual book, given the video game's storyline and features.	<ul style="list-style-type: none"> • Playing To the Moon • To the Moon's storyline • To the Moon as a book • Features of To the Moon • Attitudes on using video game in study
3. Attitudes Toward Video Games	Video games offer many benefits, and the participants prefer playing games with more action.	<ul style="list-style-type: none"> • Why they like video games • Video games they want to play

Theme 1: Reading Comprehension Performance – The participants applied traditional reading comprehension strategies when reading the commentary in To the Moon and found the formative assessments more challenging than the pretest and posttest. The participants described using traditional reading comprehension strategies when reading the commentary in To the Moon. Multiple researchers, including Engerman and Carr-Chellman (2014), found that recreational video games can provide boys with reading comprehension practice, support reading-related standards in K-12 education, and improve reading comprehension performance. In this dissertation, four formative assessments were implemented into the reading intervention program to understand the extent recreational video games have on boys' reading comprehension performance. These assessments focused on the TEKS the boys missed on the pretest and used information from To the Moon. From the participant interviews, the formative assessments were unlike the pretest and posttest, unaligned to each gameplay session, and more challenging, preventing these assessments from accurately measuring reading

comprehension performance. This section examines the two categories comprising this theme: (a) Reading comprehension strategies and (b) Formative assessments.

Reading Comprehension Strategies – The participants applied traditional reading comprehension strategies when reading the commentary in *To the Moon*, from making inferences and correct predictions to creating mental images. All six boys verbally affirmed and gestured with their heads that they had to read the video game's commentary to understand and level up. When asked by the reading teacher if they had to question the text to accomplish a task, Alejandro responded with: "[when] trying to find the funny room." The participants had to find this room earlier in the game. Sometime after, Enrique responded with: "Uh, I ask how to like, like, uh, like find where the key was, they told save the library, for the funny room." From his account, he described questioning the commentary and determining that he had to search the house's library for the key to unlock the funny room. All the participants said using this reading comprehension strategy deepened their understanding of the storyline, characters, and game.

During the Student Focus Group Interview, the participants described applying additional traditional reading comprehension strategies during gameplay sessions. One of these was re-reading passages and using background knowledge to accomplish tasks. This was evident in Alejandro's account: "When I was looking for the key to the funny room, I was like, I was kinda, I was using background knowledge, trying to find the key. And then, you know, to read the book, the page, uh, I was looking for page. I had to go back." Although *To the Moon* was age and grade-appropriate, the game's commentary often contained advanced vocabulary words the participants had to interpret. Most of the

participants use context clues in these cases. On the contrary, Enrique considered searching his Google Chromebook for a dictionary-like application. In addition to these strategies, two participants remembered connecting the game to personal experiences. The main character in the game was a widow. This character reminded Enrique of his deceased dad. He stated: “Okay, so like, me and Fernando’s dad, like passed away, so he, like me and Fernando’s dad is like the wife of the old man.” Alejandro related to the characters caring for the main character, as he once had to care for his ill uncle and injured cousin.

Formative Assessments – **The formative assessments were more challenging than the pretest and posttest.** The participants did poorly on the formative assessments. Despite their performance, they considered them a little easier than the pretest and posttest since they did not contain large reading passages and focused on the video game's storyline. According to Enrique: “I’d say it was easier to know what happened in the story. That’s why mine is like it was kind of easy, but you gotta keep... you gotta remember.” The pretest and posttest contained two large reading passages and 10 questions. Unlike these tests, the formative assessments corresponded with each gameplay session, used information from *To the Moon*, and required the participants to remember what they read and think critically about the information to successfully answer each of the five questions, each containing four answer choices. This multimodal assessment was more challenging than the pretest and posttest.

Assessment questions focused on the TEKS the participants struggled with the most on the pretest. These included the following: (1) 5.8(B), (2) 5.6(F) and 5.7(C), (3) 5.7(D) and 5.9(D) (i), (4) 5.9(D) (iii), and (5) 5.10(A). See Appendix E through H for the

formative assessments, and Appendix L for additional information on each TEKS. The researcher used the questions from the pretest and posttest corresponding with the applicable TEKS to create the five formative assessment questions. For example, question one on the pretest measured TEKS 5.8(B) and included: “Which sentence from the story reveals why Keysha decides to give her signed photograph to the boy?” Whereas, question one on Formative Assessment 1 measured the same TEKS and contained the following: “Which comment reveals why Dr. Watts and Dr. Rosalene crashed the company car?”

A key observation made by the participants was the unalignment between the formative assessments and gameplay sessions. The participants did not reach the predetermined point the researcher and reading teacher had established for each gameplay session. The unalignment made the formative assessments unnecessarily difficult for the participants, as the questions focused on aspects of the game’s story they had not seen. For example, one of the formative assessment questions asked participants: “What can the reader infer from the term “*déjà vu*” as used in the video game?” Participants would not be able to answer this question if they did not get to this part in the video game. Theodore’s statement supports this assertion: “they [the formative assessments] were hard when you didn’t get to get to those parts.” Another participant attributed this unalignment to getting every question wrong on one or more formative assessments. Another reason the formative assessments may have been more challenging than the pretest and posttest was that the participants could skim or quickly scroll through the commentary during gameplay sessions. Alejandro affirms this: “When you’re in the

game and you want to pass a part, you can go fast to read it, so that made it [the formative assessments] hard.”

Theme 2: Impressions of To the Moon – The participants enjoyed using To the Moon as a book in the reading intervention program, preferring it over an actual book, given the video game's storyline and features. There are limited recreational video games that are reading intensive, interesting to boys, simple to play, compatible with school-issued Google Chromebooks, and morally, ethically, and culturally appropriate for K-12 settings. To the Moon was the only recreational video game meeting stringent game-selection criteria the researcher found. Despite the game being more than 10 years old and reading-intensive, the participants were excited to participate in the study, knowing they would play a video game, enjoyed using To the Moon as a book, and preferred the game over an actual book. Based on the participant interviews, five categories emerged from the data creating this theme: (a) Playing To the Moon, (b) To the Moon's storyline, (c) To the Moon as a book, (d) Features of To the Moon, and (e) Attitudes on using video game in the study. The researcher discusses each category in this section.

***Playing To the Moon* – The participants liked playing To the Moon and were excited to participate in the study, knowing they would be playing a video game.** Several participants believed the video game would help them read more. This point is evident in Christopher's statement describing why he wanted to participate in the study: “I was willing to try the game out. I was thinking it will help me read more or a little bit, I really did.” At the end of the Student Focus Group Interview, Theodore made a more assertive comment about To the Moon: “It [To the Moon] will help you read more.”

Aside from the perceived benefits of the video game, participants thought playing *To the Moon* was something different to do in reading initiatives. They also enjoyed playing it on their Google Chromebooks at their own pace without having to share their devices with classmates. This was particularly significant for Enrique and Fernando, twin brothers, who share an Xbox at home.

***To the Moon's Storyline* – The participants liked *To the Moon's* captivating storyline, evident by their ability to recount specific scenes in the game.** *To the Moon* is an acclaimed, story-driven, Indie adventure, role-playing video game about two doctors traversing the memories of an elderly gentleman to fulfill his final wish of going to the moon (Freebird Games, 2021). When asked to provide an example or two of the game's storyline, Alejandro responded: "There were very interesting stories, so it's like at first it starts with something like not major, but it's like, the squirrel being hit by the car or something like that. And then it goes to something major, like the uncle in the bed, lost his memories and stuff like that." Although not entirely accurate, Alejandro described parts of the game in detail. Enrique later shared his thoughts with the group: "I thought that was like a really, like really good because before I got in the game for a little while, I saw *to the moon* and the grandpa in a comma, so like we go into the memory. You see him with his wife, with his wife on the cliff on where you see the moon, and how there is a piece that said, we all... somewhere where he said, like a book, like he wanted to go to the moon in the library." Even though Enrique's account is not entirely accurate, he describes in detail what he saw and experienced when playing *To the Moon*.

Enrique had more to say about *To the Moon*'s captivating storyline. He recounted the following during one of his gameplay sessions: "They said, "Put the machine down," and they said they were talking about this and like, to access their mind, like access memories." He later continued, "At the beginning, I think I just saw like, two... the same people who does like, the saying "this is taking way too long," when they were in his mind with helmets." Enrique refers to a scene in level one of the game where the doctors prepare themselves and equipment to access Johnny's memory. In addition to recalling specific scenes, the participants appreciated knowing what was happening in the game through its frequent commentary.

***To the Moon as a Book* – If given the option in reading class, the participants said they would rather play a reading-intensive recreational video game, like *To the Moon*, than read an actual book.** In this study, the reading teacher treated *To the Moon* identically to an actual book, where participants submersed themselves in the game's rich storyline for 20 minutes during each session. When the reading teacher asked the participants what they thought about using *To the Moon* as a book in the reading intervention program, they believed the game was like an actual book and worked well. Some of the participants considered the game's storyline a candidate for publication. Christopher stated: "I think it [*To the Moon*] would be a very good book, a good mystery book." The participant interviews highlighted the potential and benefits of recreational video games on boys uninterested in reading and those struggling with reading comprehension.

***Features of To the Moon* – The participants commented heavily about how *To the Moon* required them to find specific items, characters, and places and**

perform various tasks to level up in the game. This feature kept the participants engaged as they explored the video game's environment, searching for items. These points, derived from the data, are captured in Julio's statement: "You can find stuff and um, like discover new places and all that. Theodore shared similar feelings in his feedback: "I really like it [To the Moon]. You can find a lot of stuff, and it's like a different video game from what I've played before." Being a different type of video game was another feature discussed in the participant interviews. When playing To the Moon, the participants could not go back and reread the previous commentary but could initially read the game's commentary slowly or quickly.

Attitudes on using video game in study – Integrating a recreational video game into the reading intervention program made the participants want to participate.

As the researcher sought to understand the boys' experiences with using To the Moon in a reading intervention program, a question he had the reading teacher ask the participants was what they would have changed about the study. Some participants said they would not have changed anything about the study, echoing Fernando, who stated: "I liked it [the study] the way it was." The reading teacher also asked participants to share their feelings about their participation in this study, knowing they would be playing a recreational video game. Alejandro said that he did not mind and was happy to participate. She elaborated with the following statement to elicit additional participant feedback: "Like oh, this is something I don't want to try, or you're like, meh, or excited, or looking forward to it? Or did it matter?" Enrique said he did not mind participating if he could play a video game.

Theme 3: Attitudes Toward Video Games – The participants believe recreational video games offer many benefits and prefer playing video games with more action. The final theme from the participant interviews answered the second research question of understanding the participants' experience of using a recreational video game to improve their reading comprehension performance. This theme provides unique insight into boys' perceptions of video games and the exact type they enjoy playing recreationally and would want to play in future reading initiatives in K-12 settings. The following categories emerged during data analysis, creating this theme: (a) Why they like video games and (b) Video games they want to play.

Why they like video games – Recreational video games offer many benefits.

On 13 occasions during the Student Focus Group Interview, the participants alluded to how recreational video games increased their participation during the study or could increase their participation in future reading instruction and intervention programs. When the reading teacher asked them if they wanted to play another video game in class or tutoring, they all exclaimed in unison with “yeah!” Their excitement caught the teacher by surprise. When asked why, the participants explained that playing video games are fun. Alejandro elaborates: “You’re having fun and you are uh, playing, having fun and learning at the same time.” During the participant interviews, the participants highlighted many other reasons for liking video games.

As mentioned by the participants, video games help them relieve stress, increase their motivation during gameplay, and could serve as reading-related homework. The latter point is not well-captured or apparent in the existing literature. Some of the participants in this study were raised by single parents or guardians and came from low-

income families. Having a recreational video game, like To the Moon, on their Google Chromebooks they could play at home resonated with Enrique, who stated: “I wish I could have it [To the Moon] at home.” He later continues: “Like, something I have to do, I’ll do it at home, and I will like play the game at home, say I’ll do it at home because then I have something to do at home.” The participants shared that playing video games gives them something to do, can pass the time, teach them something new, and enhance collaboration in class and a person’s creativity. They also felt the reading teacher could use video games during independent reading or special projects in class.

Video games they want to play – The data revealed the type of recreational video games the participants play at home and want to play in future reading initiatives at school. During the participant interviews, the reading teacher asked the participants which recreational video game they would have picked for the study if given the option. They would have picked a video game containing more action and less reading. Four recreational video games surfaced from the data: Gears of War, Rocket League, Roblox, and Animal Crossing. From their responses, Gears of War is a third-person shooter video game, Rocket League is a vehicular soccer video game, Roblox allows players to create games and play them, and Animal Crossing allows players to perform various tasks, such as collecting items, fishing, and more. When asked to elaborate on their game selection, Enrique enthusiastically responded: “I’d pick the Gears of War for three reasons. One, it’s action. Two, it’s like kind of, you can be like stuck, you can be liked sneaked, like stealth. And three, you, its mysteries. You have to find like, sometimes it doesn’t matter the spot where you gotta go.” According to the participants, these video games have minimal reading.

The main recreational video game the participants would have selected contains significant violence, is unsuitable for K-12, and all four have little to no reading. Despite not being ideal candidates for reading instruction or reading interventions, the boys were genuinely excited to discuss the video games they enjoy and play. The participants may not have recommended video games like *To the Moon* since they are not as prevalent or commonplace among 10 to 11-year-old boys and because these types of video games require them to read frequently. According to the reading teacher, the participants are tier-two and three readers, and one participant in the group reads at a first-grade level. A key observation from the data was the participants voluntarily played a reading-intensive recreational video game at school for six weeks and enjoyed it. However, they would not have previously picked or played this type of video game.

Summary

The participants' performance improved from the pretest ($M = 40$, $SD = 22.40$) to the posttest ($M = 42$, $SD = 13.30$). The difference in performance at the group level was insignificant. Notable was Alejandro improved by 30 points, Fernando improved by 20 points, and Theodore improved by 10 points. Despite Enrique, an avid gamer and recreational video game enthusiast, earning the highest scores on both tests and taking the reading intervention seriously, his performance regressed by 10 points. Julio was the only other participant whose performance declined between tests. The researcher was unable to determine the cause of their regression. Christopher did not take the posttest. Moreover, the participants did marginally better on questions aligned to the fiction passage on the posttest than the nonfiction passage. Analysis of both tests showed that

they did the best on TEKS 5.3(B) (vocabulary), improved the most on TEKS 5.10(A) (author's purpose), and did the worst on TEKS 5.9(D) (iii) (genres).

The qualitative and quantitative data results highlighted the misalignment of the formative assessments to the pretest and posttest and how participants did not get to points in the game the researcher had predetermined, adversely affecting their performance on these assessments. Unlike the pretest and posttest, where participants had to read and use large passages to answer questions, the formative assessments did not contain any texts. Participants had to remember and think critically about what they read during gameplay sessions to select the correct answers. These assessments, by accident, were being used to test participants' multimodal literacy skills, explaining why the group did poorly on each. Most of the data from this instrument became unrelated to this study and not valuable in answering the research questions. Considerable to note was that the participants did the best on questions focused on TEKS 5.6 and 5.7(C), measuring their ability to make inferences using the information from the text. They did the worst on TEKS 5.10 (author's purpose). Despite being more challenging than the pretest and posttest, the participants liked how the formative assessments used information from the game and gave them a deeper understanding of its characters, events, and overall storyline.

The participants' attitudes were positive toward using *To the Moon* in this study to improve their reading comprehension performance, evident by the qualitative and quantitative data from the Student Focus Group Interview and Student Attitudes Survey. Three themes emerged from the qualitative data: 1) Reading comprehension performance, 2) Impressions of *To the Moon*, and 3) Attitudes toward video games.

From the quantitative data, the attitude scale had the highest mean and lowest standard deviation ($M = 4.00$, $SD = 0.71$), and the media affinity scale had the lowest mean and the highest standard deviation ($M = 3.50$, $SD = 1.50$). Responses to all 15 items in the Student Attitudes Survey were relatively consistent, with occasional outliers. From the reading teacher's perspective, some participants were confused with certain items given their current reading levels and may have selected inaccurate responses, explaining the few items in question. She read and clarified each item to the group to minimize this issue as they completed the survey.

CHAPTER 5

DISCUSSION, IMPLICATIONS, AND LIMITATIONS

This chapter contextualizes the study's findings within the literature. This study aimed to determine whether a recreational video game can help fifth-grade boys struggling with reading comprehension at an elementary school in Texas. The researcher collected and analyzed quantitative (i.e., pretest and posttest, formative assessments, and Student Attitudes Survey (part one)) and qualitative data (i.e., Student Focus Group Interview and Student Attitudes Survey (part two)). The data answered both research questions. This chapter examines the following sections: (a) Discussion, (b) Implications, and (c) Limitations.

Discussion

RQ 1: How and to what extent does a recreational video game affect fifth-grade boys' reading comprehension performance?

Research question one sought to understand changes in the participants' performance from using *To the Moon* in a six-week-long reading intervention program. The researcher used a pretest, posttest, four formative assessments, and a Student Focus Group Interview. Participants conducted the pretest on week one and the posttest and Student Focus Group Interview on week six. Applying the recommendations in Bartha and Elleman (2017), the reading teacher began each session with a mini-lesson focused on the reading strategies supporting the questions and associated TEKS the participants missed on the pretest. They practiced these strategies as part of guided practice, played

To the Moon, and completed a five-question formative assessment using information from the video game. Formative assessments focused on the TEKS the participants missed on the pretest. These included the following TEKS: (1) 5.8(B), (2) 5.6(F) and 5.7(C), (3) 5.7(D) and 5.9(D) (i), (4) 5.9(D) (iii), and (5) 5.10(A). The researcher analyzed the participants' performance between the tests and four formative assessments and examined designated TEKS per instrument, participant, and group. He merged his quantitative and qualitative findings to answer this research question. Two subsections guide the discussion: (a) Positive Effects and (b) Negative Effects.

Positive Effects

The participants' performance improved from the pretest ($M = 40$, $SD = 22.40$) to posttest ($M = 42$, $SD = 13.30$). See Appendix C for the pretest and Appendix D for the posttest. Despite the marginal change in the group's performance, Alejandro improved by 30 points, Fernando by 20, and Theodore by 10. Studies show that incorporating recreational video games into reading programs gives boys reading comprehension practice that may significantly increase their performance (Carroll, 2016; Engerman et al., 2019; Mahmoodi-Shahrehabaki, 2019). The participants improved on questions one (TEKS 5.8(B)), two (TEKS 5.3(B)), five (TEKS 5.8(C)), seven (TEKS 5.7(D) and 5.9(D) (i)), and nine (TEKS 5.10(A)). The improvement was minimal for questions one, five, and seven, sustained and enhanced for question two, and significant for question nine. These findings confirm that To the Moon supported reading standards in K-12 education and contributed to the literature as previous studies were unable to determine which reading standards recreational video games support, nor the methods for assessing and making such determination (de Freitas, 2018; Southgate et al., 2017; Spires, 2015).

The participants did the best on question two, measuring TEKS 5.3(B). One individual missed this question on the pretest, and the entire group answered it correctly on the posttest. Question two required the participants to use context within and beyond sentences to determine the meaning of unfamiliar or multiple-meaning words (Texas Education Agency, 2018). Although unknown, it is possible the reading intervention program and use of *To the Moon* helped the participants with this TEKS. *To the Moon* was reading intensive, and its commentary contained vocabulary words more commonplace in middle and high school and higher education. These more advanced words did not dissuade the participants from reading the commentary and playing the game. Instead, these words made them apply the traditional reading comprehension strategies they previously learned or reviewed in the mini-lessons and practiced in the guided practices. One main strategy was context clues. One participant even contemplated pausing the game and searching his Google Chromebook for a dictionary application to determine the meaning of unfamiliar words. The participants' performance on question two supports the literature: playing recreational video games can compel boys to learn new vocabulary words and understand how to spell and use them correctly in and out of the classroom while simultaneously enhancing their abilities to interpret and infer clues (Engerman & Carr-Chellman, 2014; Hein et al., 2016; Mahmoodi-Shahrehabaki, 2019).

The participants' improved the most on question nine, measuring TEKS 5.10(A). This question required them to explain the author's purpose and message within a text (Texas Education Agency, 2018). All five participants missed this question on the pretest. Three of the five answered it correctly on the posttest. It is unknown if the

participants playing To the Moon helped improve their performance with this TEKS. The researcher discussed this improvement with the reading teacher during an informal debriefing and learned that she spent additional time on this TEKS when compared to the others since the entire group missed question nine on the pretest. This may explain the participants' improved performance. In addition, studies have shown that recreational video games can strengthen boys' literacy development and provide them with opportunities to practice reading comprehension strategies aligned with specific reading standards (Engerman & Carr-Chellman, 2014; Engerman et al., 2015; Hein et al., 2016; King, 2015; Mahmoodi-Shahrehabaki, 2019). These standards include reading and comprehending various informational text types and determining the main idea, theme, and author's point of view (Engerman & Carr-Chellman, 2014).

Negative Effects

Both Enrique and Julio regressed by 10 points between the pretest and posttest, and the group did not improve on questions three (TEKS 5.7(D)) and four (TEKS 5.6(F) and 5.7(C)) and regressed on questions six (TEKS 5.6(F) and 5.7(C)), eight (TEKS 5.9(D) (iii)), and 10 (TEKS 5.6(E) and 5.6(H)). Four of the five participants incorrectly answered questions three and four on the pretest and posttest. Both questions aligned to fictional passages and gave the participants the most difficulties. Question three required the participants to retell, paraphrase, or summarize texts in ways that maintain the meaning and logical order. Question four required them to make inferences and use text evidence to support an appropriate response. Previous studies found that reading-intensive recreational video games require boys to compare and contrast characters and significant moments in a video game and can increase their ability to analyze themes and

make inferences (Engerman & Carr-Chellman, 2014; Hein et al., 2016; Mahmoodi-Shahrehabaki, 2019). The pretest and posttest did not confirm this finding.

The participants' performance regressed on three of the five questions aligned to the non-fiction passages in the posttest. These included questions six, eight, and 10. The regression for each question was marginal. The researcher and reading teacher could not determine the regression's causes. Question six required the participants to make inferences and use text evidence to support an appropriate response. Question eight tested their ability to recognize organizational patterns, such as logical order and order of importance. The entire group missed this question on the posttest. Question 10 required them to connect the text to personal experiences, ideas in other texts, and society and synthesize the information from the passage to create a new understanding. Despite the participants' performance on this question, they recalled having to use background knowledge to understand and progress in *To the Moon*, and Alejandro and Enrique were able to connect the game's storyline to personal experiences. This validated findings from previous studies determining that boys can practice traditional reading comprehension strategies by playing recreational video games, targeting reading-related skills, and state-administered assessments (Borgonovi, 2016; Carroll, 2016; de Freitas, 2018; Dindar, 2018; Southgate et al., 2017).

RQ2: What are the fifth-grade boys' experiences when playing a recreational video game to improve their reading comprehension performance?

Question two sought to understand the participants' experiences playing *To the Moon* to improve their reading comprehension performance. The researcher used the Student Focus Group Interview and Student Attitudes Survey to answer this question.

The following themes guide answering this question: (a) Attitudes toward video games, (b) Benefits from playing video games, and (c) Impressions of To the Moon.

Attitudes Toward Video Games

Using To the Moon in this study affected the participants' attitudes. A child's attitudes are a significant factor to consider when studying the gender gap in reading development and performance (Schwabe et al., 2015; Solheim & Lundetrae, 2018; Yanga et al., 2018). Attitudes can affect reading enjoyment, frequency, comprehension, class participation, and performance (Mohd-Asrafl & Abdullah, 2016; Schwabe et al., 2015; Scholes, 2019; Solheim & Lundetrae, 2018). The literature recommended future research, like this study, focus on instructional practices and text content corresponding to the needs of boys in reading programs to determine changes in their attitudes and performance (McGeown, 2015; Mohd-Asrafl & Abdullah, 2016; Schwabe et al., 2015; Scholes, 2019).

The participants' attitudes toward using To the Moon in this study may have attributed to their improved performance between pretest and posttest. The literature suggests that developing a positive reading attitude correlates with increased reading comprehension and motivation (Mincey-Jones, 2017; Pegram, 2016; Torpa, 2018). The researcher did not measure changes in their attitudes in this study. Davila and Patrick (2010) found that a child's reading attitudes and reading comprehension performance can improve from playing recreational video games. Teachers can further enhance a child's reading attitudes when incorporating recreational video games into traditional reading instruction, which occurred in this study (Conradi et al., 2013). Among the four scales in the Student Attitudes Survey, the participants had the highest mean and lowest standard

deviation ($M = 4.00$, $SD = 0.71$) on the attitudes scale. Within this scale, all six participants said they liked the idea of using a recreational video game to develop their reading abilities. However, the group either strongly agreed or was neutral about having positive attitudes toward using a recreational video game to develop their reading abilities. Differences in attitudes also occurred in the other scales within the Student Attitudes Survey, as some of the questions confused the participants given their current reading levels.

General attitudes on using *To the Moon* to improve participants' reading comprehension performance were reasonably positive in the Student Attitudes Survey, with a slight difference in opinion on selected items, indicating that not all boys shared the same attitudes. Almost all the participants believed integrating and playing a recreational video game in reading instruction could help them develop their reading abilities. However, as measured in item nine, their confidence with such an action varied. Three participants agreed, one was neutral, and two disagreed. Despite these differences, item 11, the final item in the confidence scale, revealed that almost all participants believed they would learn enough about reading fundamentals and strategies using a recreational video game to improve their reading comprehension.

Benefits From Playing Video Games

Before this study, there remained a shortage of data proving the benefits of integrating recreational video games into reading instruction for boys struggling with reading comprehension (Carroll, 2016; Engerman et al., 2015; Hein et al., 2016; Mahmoodi-Shahrehabaki, 2019; Spires, 2015). The researcher found that integrating *To the Moon* into the reading sessions on weeks two through five improved the participants'

motivation and participation and highlighted the unlocked potential and benefits these types of video games can have on boys uninterested in reading and those struggling with reading comprehension. This subsection addresses the following: (a) Reading Motivation, (b) Participation, and (c) Other Benefits.

Reading Motivation. Using *To the Moon* in this study motivated the participants to read more and improve their reading abilities. This is a significant finding contributing to the literature, as the extent of boys' reading motivation from recreational video games remains unclear compared to traditional reading instruction (Carr-Chellman, 2019; de Freitas, 2018; Southgate et al., 2017). Teachers and researchers must consider reading motivation when studying the gender gap in reading development and performance (Schwabe et al., 2015; Solheim & Lundetrae, 2018; Yanga et al., 2018). Earlier studies determined that using recreational video games on disengaged boys in traditional classrooms could increase their reading motivation (Hamilton & Jones, 2016; McGeown, 2015). A recent study by the NLT in the U.K. found that video games can motivate boys to read, become better readers, and increase their confidence (Picton et al., 2020).

The researcher concluded that *To the Moon* helped improve the participants' reading motivation based on the results from the Student Focus Group Interview, Student Attitudes Survey, and reading teacher's informal observations. The data derived from the Student Attitudes Survey was relatively reliable, but the participants' answers did not completely correlate with what the reading teacher witnessed throughout the study. For instance, item eight in the Student Attitudes Survey measured if video games could motivate boys to develop their reading abilities. The participants' responses included: one (5) strongly agree, one (4) agree, two (3) neutral, and two (1) strongly disagree. A

similar trend in responses was identified in items nine and 10, measuring the participants' confidence in using video games to develop their reading abilities and apply what they learned from the game and reading instruction to their lives. On the contrary, almost all the participants selected (5) strongly agree or (4) agree on items six, seven, and 13. Items six and seven sought to understand if playing recreational video games in reading instruction could help participants develop their reading abilities. Item 13 asked if the participants could learn enough about reading comprehension strategies by playing video games that would improve their performance.

The reading teacher's observations conflicted with some of the participant's responses to the items in the Student Attitudes Survey. The teacher believed some of them, such as Fernando, were confused about what the item was asking. The researcher and reading teacher identified and attempted to remedy this issue before the participants completed the survey on week six. This explains why the researcher tailored each item for 10- and 11-year-old boys and added an emoji scale to each item and why the reading teacher read and explained each item during the survey. The reading teacher's observations of the participants throughout the study showed that they were genuinely motivated to play To the Moon and work on their reading abilities. Several of them approached her either before or after reading class when the reading intervention program was underway to discuss To the Moon and the uniqueness of the program. On one occasion, one of her participants could not attend one of the weekly reading sessions for reasons out of his control. The reading teacher found out later from the boy's mother that he was saddened by not being able to attend the reading session and play the game.

The reading teacher had never seen the participants as motivated as they were during this study, changing how she viewed recreational video games in K-12 education and making her want to discuss the effects of this study with her school and district leadership. The Student Focus Group Interview captured and reinforced her points. For example, she asked the participants if they wanted to play another video game in class or tutoring. They exclaimed in unison with "yes" or "yeah!" Their excitement caught the reading teacher by surprise. When asked why, the participants said, "playing video games is fun and exciting." This study's findings corroborate with existing literature on reading motivation and further confirm what Davila and Patrick (2010) found: boys who play recreational video games are more motivated to read, have a better attitude toward reading, and have better reading skill development. It also supports Cummings et al. (2018) that boys' reading motivation increases when they engage in highly interesting or rewarding reading tasks.

Participation. Integrating and using *To the Moon* in this study increased the participants' participation. From the Student Focus Group Interview and the reading teacher's informal observations, the participants were excited and eager to participate in this study, knowing they would play a recreational video game. During these interviews, the participants stated on at least 13 occasions how video games increased their participation during reading sessions and could have the same effect in future reading instruction and intervention programs. According to the reading teacher, the participants took this study seriously, did not have to be told to focus, do their work, or participate in class, and were engaged in the material and gameplay sessions at a level she had not seen in them previously. The increased participation allowed the reading teacher to be a

facilitator and create an ideal student-centered, active learning environment. This allowed the participants to feel more comfortable learning reading comprehension strategies and working on their reading abilities; something they would not have willingly done.

Determining that the integration and use of *To the Moon* in the reading intervention program increased the boys' participation aligns with the literature. Hein et al. (2016) and Mahmoodi-Shahrehabaki (2019) found that boys who played recreational video games in reading class were more involved in game-related discussions and activities. Other researchers discovered that recreational video games could motivate and engage boys to learn new knowledge and skills because of their captivating and interactive virtual learning environments and focus on the learner and their interests (Arnab et al., 2012; Carroll, 2016; Engerman, 2015; Engerman et al., 2019; Huang, 2019). The virtual learning environment that recreational video games create can be immersive, powerful, and engaging, be more effective and motivating than traditional instruction and educational material, and enable boys to take a more active role in their learning (Arnab et al., 2012; Carr-Chellman, 2019; Engerman et al., 2015; Hein et al., 2016; Huang, 2019).

Other Benefits. From the Student Focus Group Interview, the participants highlighted the potential advantages and benefits recreational video games can offer boys struggling with reading comprehension. When integrated with reading instruction, recreational video games can be fun, relieve stress, pass the time, give students something new to do, and promote a natural, healthy form of self-expression. These points complement existing literature on this subject (Bacalja, 2018; Carr-Chellman, 2019;

Carroll, 2016; Engerman et al., 2015; Engerman et al., 2019). What was not captured in this study or from discussions with the reading teacher was if students used the gameplay sessions to compete with each other or if they viewed failure in the game as constructive and necessary for development.

From the participants' perspective, recreational video games could teach them something new, like more advanced vocabulary words, improve their creativity, and enhance collaboration in class. The literature thoroughly documents how video games can enhance collaboration in reading instruction. Arnab et al. (2012) found that recreational video games can improve collaboration at school because of their engaging and peer-supported learning environments and ability to foster teamwork, camaraderie, and participation. Consistent with these points are the contributions of King (2015) and McTigue and Uppstad (2018). These researchers believe video games can be critical to boys' success in reading comprehension initiatives if students have the option to participate in gameplay sessions with their friends and receive peer feedback, critiques, and compliments. The participants also considered recreational video games candidates for independent reading assignments in class and reading-related homework, points not well-captured or apparent in existing literature, requiring further examination.

Impressions of To the Moon

The participants' impressions of *To the Moon* were positive. They thought it was something different to do in a reading intervention program. More importantly, the participants enjoyed using *To the Moon* as a book in the study, preferring it over an actual book, given its rich storyline and features. A key finding in this study was they recalled applying traditional reading comprehension strategies while reading the game's

commentary. This subsection addresses: (a) To the Moon as a Book, (b) To the Moon's Storyline, and (c) Reading Comprehension Strategies.

To the Moon as a Book. The researcher and reading teacher treated To the Moon as a book in this study, changing how the participants viewed and played it. From the data, the participants enjoyed using this recreational video game as a book in the study, preferring it over an actual book. They believed the game served its purpose well. If given the option, the participants would rather play a reading-intensive recreational video game, such as To the Moon, than read a book. Many of them believed this game helped them read and read more. These points align with the literature. Several studies found that boys are more willing and excited to read and read more from the texts in a video game than printed texts (Carroll, 2016; Engerman & Carr-Chellman, 2014; Engerman et al., 2015; McTigue & Uppstad, 2018; Spires, 2015). This is likely because recreational video games are meaning-making activities with consequences predicated on reading speed and comprehension accuracy (Carroll, 2016; Engerman & Carr-Chellman, 2014; Engerman et al., 2015; McTigue & Uppstad, 2018; Spires, 2015). Playing video games is fun, increases boys' desire to read for enjoyment, and creates an enriching experience during gameplay sessions (Conradi et al., 2013; Picton et al., 2020).

To the Moon's Storyline. The participants liked To the Moon's award-winning and captivating storyline, unmistakable by their ability to recount specific scenes in the game. At one point during the Student Focus Group Interview, the reading teacher recorded Enrique describing a part in one of his gameplay sessions: "Like, where he like, turned on the, I think when he like, turned on the lights from [to] the funny room, there was like, uh, lots of rats [origami rabbits] that was looking at him [Dr. Neil Watts]." The

motivating and engaging benefits of recreational video games can help boys retain what they have learned (Borgonovi, 2016; Brooks et al., 2015; Imlig-Itenl & Petkol, 2018; Southgate et al., 2017; Spires, 2015). This is because boys playing these games exhibit deep levels of understanding, have enhanced attention and focus, and have better strategic thinking skills (Cummings et al., 2018; Engerman & Carr-Chellman, 2014; Imlig-Iten & Petko, 2018; Mahmoodi-Shahrehabaki, 2019). In addition, the high-quality narratives, graphics, music, and compelling characters used in recreational video games can create and maintain a suspenseful atmosphere that draws boys into their digital worlds (Carroll, 2016; Hein et al., 2016; McTigue & Uppstad, 2018). Not only did the participants appreciate *To the Moon*'s acclaimed storyline and know what was happening in the game from its frequent commentary, they considered it a candidate for publication.

Reading Comprehension Strategies. A significant finding in this study was that the participants recalled applying traditional reading comprehension strategies they previously learned or reviewed in the mini-lessons when reading the commentary in *To the Moon*. The data obtained from the Student Focus Group Interview supports this assertion. Strategies they recalled applying during gameplay sessions included making inferences and correct predictions and creating mental images. During the discussions, all six participants affirmed and gestured with their heads that they had to question the video game's commentary to understand the storyline, characters, and game to accomplish tasks and level up. Alejandro remembered using background knowledge to understand the game's commentary and advance. He and Enrique also spoke openly about their deep personal connections to the game, where Alejandro remembered feeling for the characters and making him remember when he had to help care for ill and injured

relatives. On the other hand, Enrique connected the main character in *To the Moon* to his deceased father.

The findings from this study complement the literature and answer an important literature gap. Carroll (2016) and de Freitas (2018) found that recreational video games can provide boys with reading fundamentals and practice and potentially increase their reading motivation, frequency, and performance. When integrated with reading instruction, these video games can give boys reading comprehension practice and enhance and expand their metacognitive skills (Carroll, 2016; Engerman et al., 2019; Mahmoodi-Shahreabaki, 2019). Other studies showed that recreational video games could reinforce literacy development and allow boys to practice reading comprehension strategies aligned with designated state-administered assessments (Engerman & Carr-Chellman, 2014; Engerman et al., 2015; Hein et al., 2016; King, 2015; Mahmoodi-Shahreabaki, 2019). Specific standards include reading and comprehending various informational text types and determining the main idea, theme, and author's point of view (Engerman & Carr-Chellman, 2014). The literature does not provide reading teachers and researchers with an appropriate recreational video game they can use on boys struggling with reading comprehension at school (de Freitas, 2018; Southgate et al., 2017; Spires, 2015). This study determined that *To the Moon*, although not a silver-bullet solution, is a suitable reading-intensive recreational video game teachers can use on their boy learners compatible with school-issued computers.

Implications

This section addresses the following implications: (a) Personal Implications, (b) Implications for Upper Elementary School Reading Teachers, and (c) Implications for Future Research.

Personal Implications

The researcher serves as the Learning Capabilities Officer for Training Command within the U.S. Marine Corps Training and Education Command. As a member of the learning technologies field, he learned several lessons from this study he will use in and out of the military. These personal implications include: (a) Integrating Recreational Video games into Reading Instruction, (b) Serving as a Scholarly Practitioner in this Study, and (c) Studying a Vulnerable Population Outside the Scope of Expertise.

Integrating Recreational Video Games into Reading Instruction. When the researcher began studying the gender gap in reading portions of state-administered assessments in K-12 education, he was optimistic about integrating and using an appropriate recreational video game to improve fifth-grade boys' reading comprehension. What first appeared straightforward and possible was not. Few peer-reviewed studies used recreational video games on boys in reading instruction, and none used a game as a book (Carroll, 2016; Hein et al., 2016). Most studies used educational games (de Freitas, 2018; Marklund, 2016).

The researcher was confident he could find a suitable game for this study, given the popularity and magnitude of the gaming industry and troves of recreational video games (Brooks et al., 2016; Engerman, 2018). The issue he discovered was that there are few reading-intensive recreational video games appropriate for K-12 settings (Arnab et

al., 2012; Carroll, 2016). Top video games played by and attractive to boys contain violence, ranging in severity (Brooks et al., 2016; Engerman, 2018). Some of these games even include profanity and nudity. The video games the researcher found and tested for this study were challenging to play, designed for and intended for adults, contained distracting banners, or required the participants to create an account using an active email address. It took him a year to find and test *To the Moon*. The game met his game selection criteria.

Another challenge was to determine how to integrate *To the Moon* into a reading intervention for fifth-grade boys. The researcher found that available literature on using recreational video games in K-12 education was accurate. Integrating recreational video games into reading instruction was time-intensive. It required the researcher and reading teacher to play *To the Moon* extensively to determine how the participants could transfer gameplay sessions to learning or reinforcing specific TEKS and how the game could support the STAAR (Arnab et al., 2012; McTigue & Uppstad, 2018; Southgate et al., 2017). During this planning, the researcher and reading teacher decided to view and treat *To the Moon* as a book and learning technology. The shift in mindset among the participants was evident. No longer was *To the Moon* a recreational video game. It was a motivating and engaging fictional book that would motivate and engage the boys to read, read more, and focus on improving their reading abilities.

Serving as a Scholarly Practitioner in this Study. As a Marine Corps officer and learning capabilities officer, the researcher began this study understanding that challenges would require him to shift the plan when necessary. He did not understand what it meant to serve as a scholarly practitioner until he was making final preparations

for the study and started encountering problems, and when the study began. The researcher received approval from the elementary school district to conduct this study. At this point, he had 15 participants, comprising tier-one, two, and three readers. The researcher and reading teacher had to adjust the plan and number of participants because the district's IT department would not install To the Moon on school-issued Google Chromebooks since the game was not labeled "educational" in Google Play. Carroll (2016) and Southgate et al. (2017) emphasize in their studies that teachers and researchers wanting to use recreational video games in K-12 education must ensure these games work on school technologies and comply with mandated policies.

The researcher focused the study on tier-two and three boys, comprising six participants and purchased refurbished Google Chromebooks, mirroring those used at the elementary school. The age and model of the refurbished Google Chromebooks prevented him from buying and downloading To the Moon from Google Play onto each device. Therefore, he had to add Windows 10 to each computer, turn them into Ultrabooks, and add To the Moon to each. The researcher modified and designated each computer for the participants. Their usernames were "Participant" and their assigned number, and they had to input "password" to access their computer. To the Moon was the only icon on their desktops. The researcher disabled most of the computer's features, including its Wi-Fi. Participants could not connect to the school's Wi-Fi or intranet. These actions ensured the researcher complied with the school and district's IT policies and IRB approval agreement.

Before the study began on January 18, 2022, the researcher and reading teacher made final preparations that overlooked other important considerations. Some of these

included having a plan for participants missing sessions, as this study occurred during the Coronavirus pandemic, not getting to predetermined locations in the video game, and how to best assess participants' understanding of the material after each session.

Although the researcher and reading teacher adjusted the plan when needed, such as giving Alejandro and Christopher formative assessments applicable to where they were in the game when they missed a session, the unintentional multimodal nature of the formative assessments did not mirror the STAAR, was overly difficult, and did not measure participants' understanding of the material.

Studying a Vulnerable Population Outside the Scope of Expertise. When the researcher started his doctoral program, he had finished a three-year tour serving as the Assistant Professor of Naval Science at Tulane University in New Orleans, Louisiana. He was passionate about understanding why millions of young men decide not to attend higher education annually compared to young women. Getting more men to attend American colleges and universities after graduation remains a problem. The researcher was excited to explore this problem further and determine actionable and out-of-the-box solutions using modern technology. Little did he know that his problem of practice would shift from understanding the problem at its current level to exploring root causes. One key contributor to this problem, the researcher discovered, was the transition boys make between upper elementary and middle school when they go from learning how to read to reading to learn (Kingdon et al., 2017; Reilly et al., 2018). He would partner with an elementary school in his home state and pursue this study, not being a K-12 teacher or reading specialist and not knowing anything about improving fifth-grade boys reading comprehension performance.

The researcher could not conduct an action research study since he was not a certified K-12 teacher or reading specialist and did not have a sphere of influence at the elementary school. He was constrained to work with the reading teacher for all matters involving the sample and study. Complimenting this dynamic and integrated partnership, the researcher focused his doctoral studies and work on exploring ways to create a more motivating and engaging curriculum and instruction for boys struggling with reading comprehension. The learning curve was significant, and what he discovered in the process was shared with the reading teacher. These insights gave them a valuable and new perspective they would later integrate and test in this study. Even though the researcher could have conducted an action researcher study impacting hundreds if not thousands of service members in his command, he would not have been as passionate about it.

Implications for Upper Elementary School Reading Teachers

The gender gap in reading portions of state-administered assessments in the U.S. remains unsolvable. Upper elementary school teachers should not dismiss or overlook this gap, as it may contribute to other issues, such as the low number of men attending U.S. colleges and universities annually. Instead, they should examine and reflect on their current practices and curriculum for teaching boys reading comprehension strategies, understanding that their interests and motivations may be at odds in the classroom and with course content and expectations (Carr-Chellman, 2019; Eate et al., 2017; Engerman et al., 2019; Hein et al., 2016). This section addresses implications for upper elementary school reading teachers and includes the following subsections: (a) Viewing

Recreational Video Games as Learning Technologies and (b) Using Recreational Video Games to Increase Reading Motivation.

Viewing Recreational Video Games as Learning Technologies. Although some K-12 teachers in the U.S. use recreational video games like Minecraft in K-12 education, other teachers and parents still reject their use and value (Engerman et al., 2019; Martinez et al., 2022; Southgate et al., 2017). Upper elementary school reading teachers should relinquish their trepidation regarding these games and view them as learning technologies. Recreational video games are valuable tools for academic learning and can support fifth-grade reading instruction and initiatives when implemented effectively (Martinez et al., 2022). These learning technologies should never seek to replace effective instruction. They are tools that can support the curriculum and state-administered assessments, provide learners with additional reading-related knowledge and practice, and improve academic performance (Borgonovi, 2016; Dindar, 2018; Huang, 2019; McTigue & Uppstad, 2018; Southgate et al., 2017). This study is a launching point for upper elementary school teachers to integrate and use reading-intensive recreational video games like *To the Moon* in reading instruction and intervention programs for boys struggling with reading comprehension.

Using Recreational Video Games to Increase Reading Motivation. Using *To the Moon* in this study motivated the participants to read, take each reading session seriously, and work on their reading abilities. This increased motivation may have contributed to their increased performance between pretest and posttest, such as Alejandro, who improved by 30 points. Reading motivation is a critical factor that upper elementary school reading teachers should consider when determining how to help boys

struggling with reading comprehension (Schwabe et al., 2015; Solheim & Lundetrae, 2018; Yanga et al., 2018). This study confirmed what Davila and Patrick (2010) and Picton et al. (2020) determined in their studies: recreational video games can motivate elementary-aged boys to read while boosting their confidence and reading abilities. What the reading teacher observed in this study was unlike anything she had experienced before with fifth-grade boys. The participants wanted to continue playing *To the Moon* and another reading-intensive recreational video game in reading class. Following this study, she planned to speak with her principal and district leadership about her experiences and observations in this study and advocate for a policy change to give reading teachers another tool to motivate disengaged students to read and improve their reading abilities.

Implications for Future Research

The findings and interpretations for this mixed-methods case study suggest four implications for those seeking to integrate and use a reading-intensive recreational video game in future studies supporting boys struggling with reading comprehension. These implications include: (a) Reading Intervention Programs, (b) Recreational Video Games, (c) Student Attitudes Survey, and (d) Assessments.

Reading Intervention Programs. Future studies should view and use reading-intensive recreational video games as books, include mini-lessons on traditional reading comprehension strategies, extend gameplay sessions, and use informal formative assessments as needed. Researchers should extend the length of their studies by several weeks and include additional reading sessions weekly. While the study was completed with six participants, increasing the number of participants would strengthen the study's

findings, validity, and credibility. This study concentrated on tier-two and three readers. Including tier-one readers would expand the scope of the research. Furthermore, research shows that boys struggle with reading earlier in their education than girls, and the gender gap increases throughout their K-12 education. Including girls in future studies may enrich the data and determine if these interventions similarly improve their reading comprehension performance.

Researchers seeking to replicate or enhance this study should construct theirs with greater flexibility in anticipation of unforeseeable issues. This will help minimize any disruptions. These studies should include formal observations and a research journal and focus on student collaboration during gameplay sessions. The research journal could include what the participants say and do and any critical moments, including laughing, joking, and competitive gestures and comments. Further exploring reading instruction and intervention programs using reading-intensive recreational video games will contribute to the literature and give teachers additional information they can use on boys struggling with reading comprehension.

Recreational Video Games. It took the researcher a year to find *To the Moon* for this study. Finding this recreational video game per the established criteria and determining its applicability in this study was time-intensive. Future studies should identify and test other suitable recreational video games. Several defining components of a good game are having a clear goal, relevant rules, feedback and assessment options, and opportunities for student choices within the game. These all lead to higher levels of student engagement (Carroll, 2016; Southgate et al., 2017). While future studies could

use *To the Moon*, teachers and researchers should identify other reading-intensive video games containing more action (Brooks et al., 2015; Carroll, 2016; Dindar, 2018).

Given the elementary school and district IT policies, the researcher had to purchase computers for the study. Schools and districts should permit teachers and researchers to install appropriate recreational video games onto school-issued computers and experiment with them in the classroom. This approach would allow them to explore and determine effective ways of integrating them into reading instruction and intervention programs (Arnab et al., 2012; McTigue & Uppstad, 2018; Southgate et al., 2017). Examples include using reading-intensive recreational video games during independent reading, issuing them as classwork or homework, and incorporating them into writing assignments. While *To the Moon* was used to support the TEKS, future research could further explore and determine how recreational video games support other reading standards in K-12 education (de Freitas, 2018; Southgate et al., 2017; Spires, 2015). Based on these implications, there is a need to determine other suitable reading-intensive recreational video games and for elementary schools and districts to incorporate them into their curriculum and instruction.

Student Attitudes Survey. Future research should explore how recreational video games in reading intervention programs affect boys' attitudes, including their reading motivation. The survey used in this study only contained one item measuring reading motivation. Researchers conducting future studies could create and use custom surveys containing less than 10 items, with several items focused on reading motivation. They could have the participants complete these surveys at the beginning and end to determine any changes in their attitudes. Survey items should be short and direct if given

to elementary-aged children with low reading levels. In addition, the Student Attitudes Survey in this study collected quantitative and qualitative data. Future studies could do the same by having mixed data to understand participants' attitudes better.

Assessments. Researchers should consider designing a custom pretest and posttest containing background information or aspects of the video game the participants will play in their studies. This could apply to formal and informal formative assessments if used. Integrating information from the video game into the various assessments used in these studies could have several effects on the participants. It could make them take gameplay sessions more seriously, apply traditional reading comprehension strategies when engaging with the text in the game or on assessments, and further determine how recreational video games affect boys' reading comprehension performance. These are just a few reasons for aligning assessments to video games. Also, the format of the formative assessments could mirror the pretest and posttest. However, as recommended by the reading teacher, a better option is to use informal and verbal formative assessments episodically at the end of reading sessions. These assessments should avoid negatively affecting the participants' self-esteem. Instead, they should build confidence, stimulate quality discussion, and increase learning and performance.

Limitations

Despite this study providing valuable insight into using reading-intensive recreational video games on fifth-grade boys struggling with reading comprehension, it had several limitations. This section discusses five of these limitations: (a) Time, (b) Sample Size, (c) Theory Integration, (d) Student Attitudes Survey, and (e) Observations.

Time

Time affected this study in several ways. Six weeks was an insufficient amount of time for this study. The researcher could not comprehensively explore and understand the effects of using reading-intensive recreational video games on boys struggling with reading comprehension, even though he identified several findings contributing to the literature on the subject. Further impacting the study, the reading teacher could not meet with the participants for more than an hour per week, given her additional duties and responsibilities as the fifth-grade master reading teacher.

The participants participated in four actual reading sessions in this study during weeks two through five. Each session lasted an hour and included a mini-lesson, guided practice, gameplay, and formative assessment. The reading teacher used weeks one and six for administrative purposes. Participants completed the pretest on week one and the posttest, Student Focus Group Interview, and Student Attitudes Survey on week six. The tempo for each week was aggressive and impacted the quality of activities. Moreover, participants were tier-two and -three readers, with many requiring special accommodations. They needed more time to grasp concepts, practice applying designated reading comprehension skills, read the commentary in *To the Moon*, and complete formative assessments. Participants had 20 minutes to read and complete each five-question formative assessment and review it with the reading teacher. The researcher did not incorporate large reading passages into these assessments because the participants would have needed additional time. Without these passages, the formative assessments became a type of multimodal literacy assessment that did not contribute significantly toward answering research question one and discouraged the participants.

In addition, the participants could click through the commentary in *To the Moon* without reading it, and the formative assessments were unaligned to gameplay sessions.

Sample Size

Six tier-two and three fifth-grade boys participated in this study. The other tier-two and three boys in this grade could not stay after school for reasons outside their control. The researcher and reading teacher considered expanding this study to include tier-one boys and tier-one, two, and three girls. The diverse sample size would have expanded the study's focus, giving the researcher more valuable data on how reading-intensive recreational video games affect the reading comprehension performance and experiences of different readers and genders. This was not possible without additional computers. The district's IT department could not add *To the Moon* to school-issued Google Chromebooks because it was not labeled “educational” in Google Play. This resulted in the researcher purchasing, preparing, and using six refurbished Google Chromebooks in this study.

The small sample size in this study prevented the researcher from collecting additional quantitative and qualitative data, creating more comprehensive findings, and using other quantitative analysis methods. Therefore, he could not run a reliability analysis on the pretest, posttest, formative assessments, and Student Attitudes Survey data. The small sample size may have affected the reliability and strength of his findings, further compounded by the fact that not every participant attended each session. Alejandro missed week five, and Christopher missed weeks four and five and did not take the posttest or participate in the Student Focus Group Interview.

Theory Integration

This study drew on the Connected Learning Theory and its guiding principles. Ito et al. (2013) found that this theory can exploit digital age opportunities, like reading-intensive recreational video games, to make learning more active, engaging, and relevant for learners by linking their interest to a community, and academic topics, such as reading comprehension. Equally important is that the theory considers learners' various contexts, demands, and environments in the 21st century (Bayeck, 2016). Its approaches and principles helped the researcher prepare and conduct this study and answer his research questions. Aside from its applicability to this study, there was little information on the Connected Learning Theory, as it is still being developed (Bayeck, 2016). The lack of data prevented the researcher from finding and using research methods appropriate for this study. Thus, he did not use or test other researchers' methods and findings nor explicitly state how this study builds upon or supports this theory.

Student Attitudes Survey

The researcher used the questionnaire in Marti-Parreno et al. (2018) *Students' attitude toward the use of educational video games to develop competencies* study. This was the most relevant quantitative instrument the researcher could find, but it was designed for and used on undergraduate students. He removed the "Self-efficacy" scale and its six items, modified the 15 items for 10- and 11-year-old boys struggling with reading comprehension within reason, and included a qualitative portion containing five open-ended questions, turning the questionnaire into the Student Attitudes Survey. Even though this instrument obtained valuable data and helped answer research question two, some of the items were too similar or unclear; the survey contained too many questions;

the statements for each item were too long for the participants, given their below-grade level reading abilities; and not all items applied to this study, which confused participants and may have caused them to select inaccurate responses. This was evident with item eight: “I can be motivated to develop my reading abilities using a video game.” What appeared straightforward was not with some participants. It is important to remember that the participants had the lowest reading comprehension in their fifth-grade class at this school. The reading teacher confirmed that some participants were confused with specific items and may have selected incorrect responses. She was confident that To the Moon increased the participants’ motivation and made them want to participate in the study, read, and improve their reading comprehension. Moreover, the researcher did not conduct a reliability analysis of the Student Attitudes Survey data, given the small sample size.

Observations

The researcher was not physically present at the elementary school during the study, did not use formal observations, and relied on the reading teacher to collect the quantitative and qualitative data. He experienced occasional difficulties analyzing and determining the significance of some of the qualitative data collected during the Student Focus Group Interview and Student Attitudes Survey by not having the reading teacher’s perspective or being in the room with the participants. Observations are “one of the oldest and most fundamental research methods approaches. This approach involves collecting data using one’s senses, especially looking and listening in a systematic and meaningful way” (McKernie, 2008, p. 573).

Werner and Schoepfle (1987) identified three types of observations: (a) descriptive, (b) focused, and (c) selective. The first involves observing everything, the second concentrates on well-defined, observable entities, and in the third, the researcher focuses on general entities (Smit & Onwuegbuzie, 2018, p. 2). Since the researcher did not use any of these observations in this study, the reading teacher attempted to verbally describe when participants made physical gestures, such as moving their heads up and down, agreeing with another participant, but not saying anything. These nonverbal cues emphasized an action in the classroom the researcher could not otherwise hear, see, or read and would have given him valuable perspective. While including observations in this study would have enhanced data analysis, it would not have been practical for the reading teacher to lead each session, support the learning needs of the participants, and capture observations.

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APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL LETTER 1



OFFICE OF RESEARCH COMPLIANCE

INSTITUTIONAL REVIEW BOARD FOR HUMAN RESEARCH APPROVAL LETTER FOR EXEMPT REVIEW

Dear Mr. Donald Meyer:

This is to certify that the research study *Boys, Reading, and Video Games: A Mixed-Methods Case Study Examining the Effects of Using a Recreational Video Games to Improve Reading Comprehension Performance at an Elementary School in Texas* was reviewed in accordance with 45 CFR 46.104(d)(1), the study received an exemption from Human Research Subject Regulations on **12/10/2021**. No further action or Institutional Review Board (IRB) oversight is required, as long as the study remains the same. However, the Principal Investigator must inform the Office of Research Compliance of any changes in procedures involving human subjects. Changes to the current research study could result in a reclassification of the study and further review by the IRB.

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

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

The Office of Research Compliance is an administrative office that supports the University of South Carolina Institutional Review Board (USC IRB). If you have questions, contact Lisa Johnson at lisaj@mailbox.sc.edu or (803) 777-6670.

Sincerely,



Lisa M. Johnson
ORC Assistant Director and IRB Manager

APPENDIX B

INSTITUTIONAL REVIEW BOARD APPROVAL LETTER 2

Notice of Approval To: Mr. Donald Meyer

From: [REDACTED]

Date: 9/17/2021

Boys, Reading, and Video Games: A Mixed-Methods Case Study Examining the Effects of Using a Recreational Video Games to Improve Reading Comprehension Performance at an Elementary School in Texas

Research Request Status: Approved

Survey Request Status: Approved

Expiration Date: August 31, 2022

The above referenced proposal has been approved as submitted for the school year 2021-2022. Please provide a copy of this approval notice with all communications regarding this request.

Please be advised of the following:

- If your project includes a research request, no surveys may be administered until the full research request has been approved.
- Participation in this research is voluntary and dependent upon campus principal approval and, where applicable, parent approval.
- Student surveys must be approved by the Parent Review Committee.
- A waiver and background check are needed for each non-employee researcher that will be on campus.
- Changes to the study focus, sampling, or data collection methodology after your research request has been approved must be submitted for review by the Research Request Review Committee.

Please adhere to the guidelines established on the Research Agreement you submitted with your request.

Your point(s) of contact with the district are listed below. If you have any questions, they can be reached at the email address(es) listed.

Point of Contact Name

[REDACTED]

Point of Contact Email

[REDACTED]

Please see below for any additional notes regarding your request: N/A.

We wish you success in this study and look forward to receiving the final study report.

APPENDIX C

PRETEST

Read the selection and choose the best answer to each question. Then fill in the answer on your answer document.

A Winning Day

1 “Here we are, Keysha,” Mom said, pointing to two seats in the front row of the basketball arena, near the home team’s bench. “I know how long you’ve waited to see your favorite basketball player in person,” she added with a smile.

2 “These seats are incredible!” I exclaimed. “It was really nice of your boss to give you these tickets.”

3 “Did you remember to bring the photo?” Mom said.

4 “Of course.” I waved my photo of Dwight Edwards at her. I was thrilled to be at my first professional basketball game. But even more thrilling was the fact that my favorite player had joined our home team.

5 “Ladies and gentlemen, the Sousville Bearcats!” the announcer’s voice blasted through the arena. “At point guard, wearing number 45... Dwight Edwards!” The crowd roared, and I cheered until my throat stung. I could not believe I was seeing the Dwight Edwards in person!

6 Throughout the game against the Raiders, Dwight made one fantastic play after another.

7 “Well, what do you think, Keysha?” Mom asked.

8 “This is awesome, Mom. I just hope...Do you think there’s any chance he’ll sign my photo?”

9 “I don’t know, honey,” Mom replied. “But we’re in the best seats for that to happen.”

10 I listened to the players’ shoes squeaking loudly on the court. Sometimes I could even hear the players talking to one another. On television they didn’t look so immense, but they towered above me in real life.

11 I watched the game from the edge of my seat. With 3 seconds left in the game, the Raiders were winning 94 to 93. Dwight ran right in front of me, caught a pass from another player, and slammed the ball into the basket as the buzzer sounded.

12 I jumped to my feet along with the rest of the crowd. The Bearcats had beaten the Raiders, and Dwight Edwards had scored the winning basket.

13 “Wow, Mom, what a great game!” I shouted. I kept my eyes on Dwight Edwards as the television announcers interviewed him on the court. When they were finally done, Dwight began walking toward the team bench.

14 “Now’s your chance, Keysha,” Mom said with a nudge, and we walked toward Dwight.

15 “Umm...Mr....Mr. Edwards? I’m Keysha, and I think you’re amazing.” As Dwight turned toward us, my heart began pounding in my chest like a bass drum. I summoned my courage and asked, “Would you please sign my photo?”

16 “Sure, Keysha. Thanks for coming today.” Dwight smiled as he signed the photograph and then shook my hand. I thanked him, and Mom and I turned toward the exit. “I’m never washing this hand again,” I whispered to myself.



17 “O.K., you can breathe now, Keysha,” Mom said with a laugh. As Mom guided my steps toward the exit, I watched Dwight until he disappeared into the locker room. When I turned around, I noticed a little boy in a Dwight Edwards jersey standing next to his father. He was clutching a piece of paper and a pen and was sobbing.

18 “It’s O.K., son,” I heard his father say. “We’ll meet Dwight Edwards some other time.”

19 I walked along with Mom.

20 “Did you see that boy?” I asked Mom.

21 “Yes,” she answered. “He must have really been looking forward to meeting Dwight Edwards.”

22 I looked back at the steady stream of people leaving the game. I could see the boy huddled against his dad, who stroked his hair, trying to console him.

23 I looked at Dwight Edwards’s signature on my photograph and thought about how great it had been to meet him. Then I thought about how kind Mom’s boss was for giving us the tickets that had allowed me to have this experience. “Wait here, Mom. I’ll be right back,” I said.

24 I pushed my way back through the crowd and saw that the boy and his father were still standing where I had seen them. When I reached them, I tapped the boy on the shoulder. His tear-streaked face peeked out at me from under his father’s arms.

25 “Here, I want you to have this autograph,” I said, handing the boy Dwight’s photograph.

26 The boy’s eyes widened. “Dwight’s autograph? Wow!” he exclaimed, beaming. “Thank you!”

27 “No problem,” I replied. I turned to meet Mom, who stood waiting for me.

28 “Keysha, that was very thoughtful of you,” she said, hugging me. “I know how much that autograph meant to you.”

29 I smiled at her. “I got to see Dwight Edwards play the most amazing game ever. Then I got to meet him and shake his hand. I won’t need an autograph to remember this day.”

1. Which sentence from the story reveals why Keysha decides to give her signed photograph to the boy?

- Ⓐ When I turned around, I noticed a little boy in a Dwight Edwards jersey standing next to his father.
- Ⓑ Then I thought about how kind Mom’s boss was for giving us the tickets that had allowed me to have this experience.
- Ⓒ I pushed my way back through the crowd and saw that the boy and his father were still standing where I had seen them.

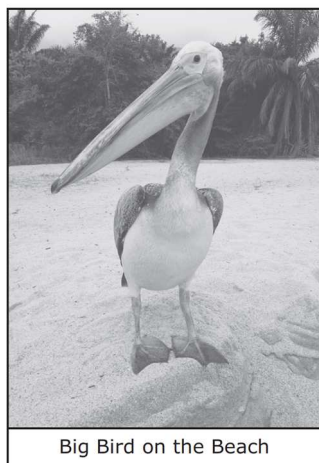
- Ⓓ When I reached them, I tapped the boy on the shoulder.
2. Which words from paragraph 10 help the reader understand the meaning of immense?
- Ⓐ squeaking loudly
 - Ⓑ talking to one another
 - Ⓒ towered above me
 - Ⓓ in real life
3. What is the best summary of the story?
- Ⓐ Keysha's mother receives tickets to a professional basketball game. Thankful for the tickets, Keysha and her mother enjoy the game together. They see an important basketball player who has just joined the team, and Keysha gets his autograph.
 - Ⓑ Keysha achieves her longtime dream of meeting her hero, a basketball player named Dwight Edwards. After the game he signs a photograph for her. Keysha feels sorry for a child who is crying because he was unable to get an autograph.
 - Ⓒ Eager to see her favorite basketball player, Keysha hopes that he will sign a photograph for her. After the game her mother encourages her to approach him. He agrees to sign the photograph and thanks Keysha for coming to the game.
 - Ⓓ Keysha and her mother go to a basketball game to see Keysha's favorite player, Dwight Edwards. Keysha meets him after the game and gets his autograph. However, a little boy's sadness leads Keysha to give the child her signed photograph.
4. In this story, the author emphasizes the importance of —
- Ⓐ making wise decisions
 - Ⓑ being generous
 - Ⓒ becoming popular
 - Ⓓ developing strong friendships
5. Paragraph 17 is important to the plot because it is when Keysha —
- Ⓐ learns that her mother understands the value of the photograph
 - Ⓑ realizes that her favorite player has to go to the locker room
 - Ⓒ feels content after meeting her favorite player
 - Ⓓ notices the crying young boy and his father

Read the selection and choose the best answer to each question. Then fill in the answer on your answer document.

Flying Lessons for Big Bird

1 An injured great white pelican picked the right spot to land after a storm separated him from his flock. The gigantic bird swam out of a lake in Tanzania. Then he clumsily waddled onto the beach of an African safari resort. Startled tourists may have assumed the bird was an adult because of his large size. However, staff at the resort soon discovered that the pelican was only about three months old. They cared for Big Bird, as they called the young pelican, and nursed him back to health.

2 The great white pelican is one of the largest species of flying birds on the planet. The birds can weigh up to 33 pounds. When they spread their wings, the length from tip to tip is nearly 12 feet. The staff members knew Big Bird would need a lot of food to grow to full adult size. In the wild a flock of pelicans will work together to corral fish into shallow water and scoop them up. But Big Bird did not have a flock, so the resort staff asked the park authority for permission to feed him. With steady meals of fish provided by the resort staff, Big Bird grew bigger.



Big Bird on the Beach

3 Big Bird also changed color as he grew, which helped the staff verify that he was male. When the pelican first arrived, he was totally brown. After several months his facial mask turned pink. Orange would have identified Big Bird as a female. His elastic pouch and legs also changed to bright yellow and pink. In addition, Big Bird's beak began to grow longer and in a downward curve. The beaks of female pelicans are shorter and straighter than those of males.

4 Everyone at the resort anticipated that Big Bird would fly away and rejoin his flock once he regained his health. However, the pelican did not budge. It turned out that Big Bird needed flying lessons! The staff raced along the beach, flapping their arms to simulate the act of flying. It may have looked silly to onlookers, but showing birds how to fly is a method that is sometimes used by human caretakers. "We aren't sure how

much flying he may have already done before arriving here, but he was pretty shaky,” staff posted on the resort’s website blog.

5 The staff members, however, were not discouraged. “He would look on curiously,” the blog reported, “until one day he showed us how it was done!” Big Bird’s first attempts were short. He was wild in the air and even wilder when trying to land. There were some close calls with the beach furniture as Big Bird was learning to distinguish between the air and the ground. Little by little, though, the efforts of the staff began to pay off.



Big Bird gets flying lessons.

6 After some more practice, Big Bird rewarded his growing fan club with a video of a successful flight. The staff attached a miniature camera to his beak to capture a view of the pelican’s face as it flew. The two-minute video taken of Big Bird’s flight shows the colorful streaks of the last light of day as the sun is setting behind the lake at the resort. Big Bird landed at the very same spot he took off from just as day was turning into night. “We are so proud of him, and he is such a clever bird. He can fly!” Big Bird’s trainers said.

7 No one is sure how long Big Bird will stay at the resort. He may one day take flight, find a flock of pelicans to join, and never return to the place where he learned to fly. Until then, though, staff members and tourists are glad to be part of his human family.

6. Based on paragraphs 4 and 5, what can the reader infer about the staff members at the resort?

- Ⓐ They needed more training to learn how to help animals.
- Ⓑ They used the resort’s blog to share information about native wildlife.
- Ⓒ They wanted to make sure that Big Bird learned a necessary skill.
- Ⓓ They thought that having Big Bird at the resort would discourage tourists from visiting.

7. In paragraph 2, the details about how great white pelicans catch fish support the idea that Big Bird —

- Ⓐ could not have survived on his own without help

- Ⓑ left his flock because he was unable to find food
- Ⓒ had injuries that kept him from fishing on his own
- Ⓓ was not familiar with the food at the resort

8. How does the author organize the information in paragraph 3?

- Ⓐ The author uses cause and effect to explain why the appearance of pelicans changes.
- Ⓑ The author uses logical order to help the reader understand how pelicans came to look the way they do.
- Ⓒ The author uses sequential order to show what is interesting about the way pelicans fish.
- Ⓓ The author uses compare and contrast to explain what male and female pelicans look like.

9. The author's primary purpose for writing the selection is to —

- Ⓐ share interesting facts about a large species of bird
- Ⓑ explain how the staff at a resort is taking care of a large bird as it grows up
- Ⓒ tell about the methods bird experts use to encourage birds to fly
- Ⓓ describe how a lost bird caused problems for tourists at a beach resort

10. Read these sentences from the selection.

Everyone at the resort anticipated that Big Bird would fly away and rejoin his flock once he regained his health. (Paragraph 4)

He may one day take flight, find a flock of pelicans to join, and never return to the place where he learned to fly. (Paragraph 7)

These sentences help the reader understand that Big Bird's caretakers —

- Ⓐ lack the resources to give Big Bird what he needs
- Ⓑ know that Big Bird belongs in the wild
- Ⓒ believe that Big Bird will get lost if he flies away
- Ⓓ are trying to find out where Big Bird came from

APPENDIX D

POSTTEST

Read the selection and choose the best answer to each question. Then fill in the answer on your answer document.

Playing the Field

by Janette Rallison

- 1 At home I continued to be a model son in order to persuade my parents I did, indeed, need a room of my own. That night after dinner while I cleared off the table and Mom put things in the dishwasher, I asked her, “Did you and Dad talk about moving Kirk out of my room?”
- 2 “Well, we talked about moving you into the office.”
- 3 “Me? Why do I have to be the one to move?”
- 4 “Because you’re the one who wants his own room.”
- 5 “But Kirk’s the one that’s impossible to live with.”
- 6 Mom handed me a dishcloth. “Kirk’s been in that room since he was a baby. It will be easier on him to be alone if he’s still in familiar surroundings.”
- 7 “But all the stuff in that room is mine. It’s decorated with posters of my favorite baseball players.”
- 8 “I know it’s not exactly fair,” Mom said, “but if you want your own room, you’ll have to make some concessions.”
- 9 I knew she meant I had to let Kirk have his own way.
- 10 “But don’t you think Kirk would like to decorate a room with something he likes?” I asked. “Something with cowboys or astronauts or trains?”
- 11 Mom poured the dish soap into its tray. “Kirk does like trains,” she said. As she wiped off the counters, she called, “Kirk!” A few moments later he trotted in.

12 Mom put on the overly happy face she always uses to try to get Kirk excited about something. “Hey, sweetheart, I was just thinking about how much you like trains. Maybe you’d like to spend more time with some trains.”

13 “Are we going someplace?” Kirk asked hopefully.

14 “Well, no. I was just thinking maybe we could decorate the office with train things. Would you like that?”

15 “Yeah,” Kirk said slowly, as though he knew there was a catch but wasn’t sure where.

16 “Wouldn’t it be fun to move your bed in with all of the train things?”

17 “No!” His face scrunched up, and he put his hands on his hips. “I’m not moving to the office. I want to sleep in my baseball room.” He stomped off.

18 She sighed. “We’ll give him a little time to adjust to the idea.”

19 I figured he could adjust while I moved his things out, but I didn’t say so. I was being a model child.

20 On Sunday I told Kirk over and over again how neat his new room would be. It didn’t matter. Kirk refused to adjust. He wanted his closet, his window, and his posters, which unfortunately also happened to be my closet, my window, and my posters.

21 Mom and Dad said they’d try to reason with Kirk about it. Since when has reason solved anything in the world?

22 That night I tried my own methods to convince Kirk to move.

23 “Kirk,” I said, “I haven’t told you this before, but there’s buried treasure somewhere in the office.”

24 Kirk surveyed me skeptically. “What kind of treasure?”

25 “Gold and silver,” I whispered in awed tones, but when he didn’t look impressed, I added, “And Hot Wheels, and flashlights, and swords. If you move into the office, I bet you’ll be able to find it.”

26 “How come Mom and Dad have never told me about the treasure?”

27 “They don’t know about it. It was left there by the people who owned the house before we did.” I continued slowly, “I discovered a map for the treasure. I was going to find it myself, but if you agree to move to the office, I’ll give you the map.”

28 Kirk pulled on the top to his pajamas carefully. I knew he was thinking it over.

29 “And I’ll tell you another secret.” I looked under the bed quickly as I said this. “I’ve also discovered a bunch of monsters have moved into this room. I think I’d better stay here and fight them off so they don’t eat anyone.”

30 I flung the closet door open quickly and jabbed my hand into the clothes a few times.

31 Kirk said, “You’re just trying to scare me so I’ll move out.”

32 I put my arm against the back wall of the closet and acted like I was being sucked in. “Oh, no!” I yelled. “One’s got me now!”

33 Kirk let out a scream and ran down the hallway to our parents’ room.

34 After a few minutes, Dad came into the room holding Kirk’s hand and gave me a stern lecture about putting ideas into my brother’s head. I don’t know what Dad was worried about. If I could really put ideas in Kirk’s head, the idea that he should move into the office would have stuck.

1. What does the interaction between Mom and the boys show about her?

- Ⓐ Mom is eager to help the narrator with his request.
- Ⓑ Mom tries to consider everyone’s feelings when making decisions.
- Ⓒ Mom is angry that she has to give up her office for the narrator.
- Ⓓ Mom expects her children to act perfectly at all times.

2. In paragraph 8, the word concessions refers to something that is —

- Ⓐ created by accident
- Ⓑ decided without much thought
- Ⓒ kept in a special area
- Ⓓ done in order to come to an agreement

3. What is the best summary of paragraphs 1 through 19 of the story?

- Ⓐ The narrator helps clean the table because he wants his own room. He is upset to hear that he will have to be the one to change rooms. He suggests that his brother would like a new room with his own decorations. He reminds his mother that Kirk really enjoys trains.
- Ⓑ The narrator asks his mother if she and his father talked about moving Kirk into a different room. The mother considers that Kirk might like to decorate a new room. She mentions trains to Kirk. Kirk becomes excited and thinks they are going somewhere with trains.
- Ⓒ The narrator thinks of a plan that will make his brother happy and allow them both to have their own rooms. His mother says that Kirk should stay in the room he is currently in. She explains that he has always been in that room and would be more

comfortable there.

- Ⓓ The narrator tries to be helpful so he can get his own room. He becomes upset when his mother says that he will have to move into the office. He tells his mother that Kirk would enjoy the new room. She talks to Kirk, but Kirk refuses to move out of their current room.

4. Read this sentence from paragraph 21.

Since when has reason solved anything in the world?

This sentence suggests that the narrator believes —

- Ⓐ his parents do not understand why he wants his own room
 - Ⓑ he is unlikely to get the outcome he wants
 - Ⓒ his brother is too young to understand what is being asked of him
 - Ⓓ he has the same problem as many of his friends
5. Which event occurs as a result of the narrator's conversation with Kirk?
- Ⓐ Kirk decides he would enjoy having trains in his room.
 - Ⓑ The narrator realizes that sharing a room with Kirk is not all bad.
 - Ⓒ Kirk becomes excited about moving his bed into the office.
 - Ⓓ Dad is unhappy that the narrator tried to scare Kirk.

Read the selection and choose the best answer to each question. Then fill in the answer on your answer document.

Winter Counts

- 1 In the late 1700s and 1800s, Lakota Indians roamed the grassy western plains of the United States. Like many other American Indian tribes, the Lakota did not use writing. Still they wanted to remember important events. To do this, they made winter counts. A winter count is a piece of buffalo skin, cloth, or paper that is covered with small pictures. One picture marks each year since the winter count began.
- 2 This collection of pictures was called a winter count because the Lakota measured each year from the first snowfall of the season to the next year's first snowfall. The winter count helped the tribe keep track of what happened and when.



The "Lone Dog's Winter Count" records events from 1801 through 1876.

Fine Art / Contributor/Getty Images

The Keeper's Role

3 Since the Lakota did not write their language, they passed down their history orally. Parents told their children about past events. When those children grew up, they told the same stories to their children.

4 In each Lakota community, there was one person who knew all the stories very well. This person was called the keeper. The community listened to the keeper when it wanted to know its history. Hearing about past events helped the members of a community learn ways to stay healthy, strong, and united against enemies.

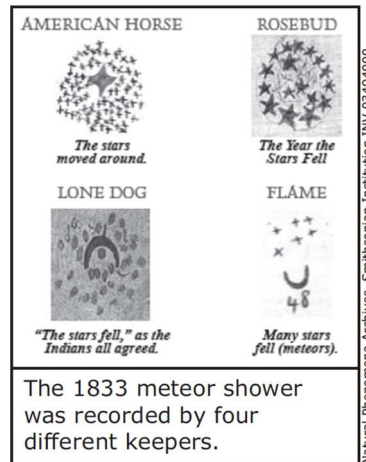
5 The keeper was in charge of the winter count, which he kept among his personal belongings. He was the one who added a new picture each year. If the pictures on the winter count started to fade, he copied them onto a new one. When a keeper got old, he gave the winter count to his son, who became the community's new keeper. Keepers were almost always male.

6 Caring for the winter count was just one part of a keeper's job. His larger task was remembering the community's history. To do so, he had to remember hundreds of events, even things that had happened many years ago. The winter count, though important and useful, did not show details. Its drawings were very simple. They were meant to trigger memories, not serve as works of art. When a keeper saw a certain picture, it was supposed to make him think of all the important things that had happened during that year.

Ordering the Years

7 When it was time to add a new picture to a winter count, the keeper talked with the oldest and wisest members of the community. Together they decided which event should be drawn. The event had to be something many people had seen or known about. "Black Crow won the battle" might define one year. "Many buffalo" might mark another year as special.

8 Sometimes different keepers used the same event to mark a year. In 1833, many Lakota Indians saw a spectacular meteor shower. They watched as many shooting stars flashed across the night sky and appeared to drop to Earth. Four different keepers—American Horse, Rosebud, Lone Dog, and Flame—drew meteor showers on their winter counts that year. Each of the four pictures is different, but they all refer to the same event.



9 Not all of the pictures on winter counts were arranged the same way. Some winter counts had rows of pictures. On other winter counts, the earliest pictures were in the middle, and the more recent pictures circled outward. The pattern was not important; placement was what mattered. Each new picture had to be placed next to the one that had been painted the year before. The placement allowed a person to count backward to find out how long it had been since, for example, his community had made peace with another group. The winter count could also show people how old they were. If a woman had been born in “the year when everyone was very sick,” for example, she found that picture. Then she counted how many years had passed since then. In this way, the winter count served as a calendar.

A New Purpose

10 By the 1930s, most Lakota had learned to write, which gave them a new way to document their history. Winter counts were no longer necessary. Today only a few winter counts survive.

11 Many winter counts now hang in museums. They no longer perform the task of preserving a tribe’s history. Their information, however, is still valuable. Historians have learned many things about the Lakota by studying their winter counts. For those who know how to read them, winter counts still have stories to tell.

6. Based on the selection, what can the reader infer about the job of the keeper?

- Ⓐ Selecting someone for the position was often a complicated process.
- Ⓑ The duties were so demanding that the keeper had no other position.

- Ⓒ All of the men in the tribe were considered for the job of keeper.
 - Ⓓ The person who had the job had to be dedicated to the task.
7. What are paragraphs 1 and 2 mostly about?
- Ⓐ The Lakota lived on the grassy plains in the western part of the country.
 - Ⓑ The Lakota used pictures in place of a writing system.
 - Ⓒ The Lakota had a special way to keep track of important events.
 - Ⓓ The Lakota measured years from snowfall to snowfall.
8. The author's use of comparison and contrast in paragraph 9 helps the reader understand that winter counts —
- Ⓐ were cared for by many different keepers
 - Ⓑ provided information about a tribe's members
 - Ⓒ had unique designs but served the same purpose
 - Ⓓ were used as calendars and to tell people's ages
9. The author wrote this selection most likely to —
- Ⓐ tell the reader about how one American Indian tribe recorded its history
 - Ⓑ encourage the reader to visit a museum that displays American Indian artifacts
 - Ⓒ share important events that happened to a particular American Indian tribe
 - Ⓓ show how modern calendars are similar to those kept by American Indians
10. Which idea about the keeper is emphasized throughout the selection?
- Ⓐ He kept his winter count with his own belongings.
 - Ⓑ He served an important role within the community.
 - Ⓒ He made simple drawings without many details.
 - Ⓓ He chose where the drawings were placed on the winter count.

APPENDIX E

FORMATIVE ASSESSMENT 1

Read each question with your teacher and then select the best answer.

1. Which comment reveals why Dr. Watts and Dr. Rosalene crashed the company car?
 - Ⓐ “Where were you looking, Neil?!”
 - Ⓑ “Hm... We’ll just say I was saving a puppy.”
 - Ⓒ “Aw c’mon, I crashed the car while trying to evade it! What more do you want?!”
 - Ⓓ “Well excuse me for heroically evading that squirrel coming out of nowhere!”
2. Based on the commentary in the video game, what can the reader infer about Johnny?
 - Ⓐ He is a widow.
 - Ⓑ He is bedridden.
 - Ⓒ He is the homeowner.
 - Ⓓ He lets Lily live with him for free.
3. The details about how Johnny wants to go to the moon support the idea that he —
 - Ⓐ has unrealistic expectations.
 - Ⓑ can do this if his memory is altered.
 - Ⓒ is delirious.
 - Ⓓ has unfinished business.
4. What is the author’s primary purpose for writing the commentary in your session?
 - Ⓐ highlight the efforts of two renowned doctors, as they seek to help a dying elder.
 - Ⓑ introduce key characters, the setting, and what is to come.
 - Ⓒ reinforce the fact that people, like Johnny, will do anything for those they love.
 - Ⓓ showcase the difficulties of fulfilling last-minute requests.
5. Read these sentences from the selection.

“... it’s probably gonna be another all-nighter, y’know.”

“And I doubt they’d have any coffee...”

These sentences help the reader understand that Dr. Watts and Dr. Rosalene —

- Ⓐ dislike working at night.
- Ⓑ may have a long night ahead of them.
- Ⓒ do not have caffeine to keep themselves awake.
- Ⓓ are becoming annoyed with their situation.

APPENDIX F

FORMATIVE ASSESSMENT 2

Read each question with your teacher and then select the best answer.

1. Which comment best reflects what was in the funny room?
 - Ⓐ "...What do you know about all those rabbits?"
 - Ⓑ "A rabbit folded out of paper."
 - Ⓒ "A stuffed toy platypus."
 - Ⓓ "A broken music box."
2. What can you infer about the machine from Dr. Rosalene and Lily's conversation?
 - Ⓐ It cannot alter a person's memories without human involvement.
 - Ⓑ It is not easy to use.
 - Ⓒ People using this machine must receive specialized training.
 - Ⓓ It is heavy and expensive.
3. The doctors traveling to Johnny's memories support the idea that they —
 - Ⓐ are experts in their field.
 - Ⓑ will learn a lot about him and his past.
 - Ⓒ will have to find and then activate certain mementos along the way.
 - Ⓓ are overconfident and expect such a convoluted process to work.
4. The author's reasoning for writing the commentary in your session was to —
 - Ⓐ expose you to the ancient art of paper folding.
 - Ⓑ pique your interest in a form of time travel.
 - Ⓒ highlight possible mementos in Johnny's memories
 - Ⓓ further explore Johnny's character, interests, and recent memories.
5. Read these sentences from the selection.

"Seems like these memory hops only span a short period of time..."

"We need to find a leaping memento or it's going to take forever."

These sentences help the reader understand that Dr. Rosalene —

- Ⓐ believes they are taking too long traversing Johnny's memories.
- Ⓑ made a critical observation that requires them to change their current approach.
- Ⓒ determined how to traverse Johnny's memories quickly.
- Ⓓ is worried that they may be unable to help Johnny.

APPENDIX G

FORMATIVE ASSESSMENT 3

Read each question with your teacher and then select the best answer.

1. What comment from the video game confirms that Johnny built the house?
 - Ⓐ “It’s what she really wants.”
 - Ⓑ “Like you, I’ll be able to watch over her every day.”
 - Ⓒ “You don’t know how much this place means to her.”
 - Ⓓ “I might never understand why, but I stayed true to your wish.”
2. What can the reader infer about River?
 - Ⓐ She is Johnny’s wife.
 - Ⓑ Her medical condition is treatable.
 - Ⓒ Her medical treatment is expensive.
 - Ⓓ She questions the medical treatment's effectiveness.
3. The commentary about Anya supports the idea that —
 - Ⓐ it is the lighthouse.
 - Ⓑ it is River’s platypus.
 - Ⓒ she is Johnny and River’s daughter.
 - Ⓓ she was not in Johnny’s late memory.
4. What is the author’s purpose for writing the commentary in your gameplay session?
 - Ⓐ Intensify the story's plot to pique the reader's interest.
 - Ⓑ Show how River's final wish and decision impact Johnny.
 - Ⓒ Prove that people are willing to make life-changing sacrifices for those they love.
 - Ⓓ Provide the reader with essential information about River.
5. Read these sentences from the selection.

“You don’t know how much this place means to her.”

“We have a long history with that place.”

These sentences help the reader understand River’s —

- Ⓐ wish to build the house.
- Ⓑ decision to sign the papers.
- Ⓒ deep connection with the lighthouse.
- Ⓓ decision to stop receiving medical treatment.

APPENDIX H

FORMATIVE ASSESSMENT 4

Read each question with your teacher and then select the best answer.

1. What comment best supports why the local government closed the lighthouse?
 - Ⓐ “No longer needed...?”
 - Ⓑ “I suppose she’s just no longer needed.”
 - Ⓒ “...Why would they abandon her like this?”
 - Ⓓ “You know how it is, now that everything has GPS and all that.”
2. What can the reader infer from the term "déjà vu" used in the video game?
 - Ⓐ It occurs when a person sees or experiences something before it happens.
 - Ⓑ Dr. Watts and Dr. Rosalene asked Johnny questions about origami rabbits.
 - Ⓒ When one is unfamiliar with a known person or situation.
 - Ⓓ The doctors witnessed origami rabbits in Johnny's late memory and relived them
3. The commentary about River’s condition supports the idea that she —
 - Ⓐ makes illogical decisions.
 - Ⓑ had a lapse in memory or judgment.
 - Ⓒ is talkative with friends, family, and strangers.
 - Ⓓ has become obsessed with making origami rabbits.
4. What is the author’s primary purpose for writing the commentary in your session?
 - Ⓐ River's medical condition, love for the lighthouse, and desire to build new house
 - Ⓑ Explain the negative effects of neuro-related syndromes
 - Ⓒ Persuade readers that the nature of life will force them to make difficult decisions
 - Ⓓ Make River a more prominent character
5. Read these sentences from the selection.

“Well buddy, it’s sure been a while.”

“Hasn’t it? Who knew how hard it is to get across a few cities nowadays?”

The reader now understands that —

- Ⓐ Nicolas and Johnny had not seen each other in a long time.
- Ⓑ Nicolas and possibly Johnny encountered unexpected challenges traveling.
- Ⓒ Nicolas and Johnny do not live in the same town or city.
- Ⓓ the times have changed since Nicolas and Johnny last met.

APPENDIX I

STUDENT FOCUS GROUP INTERVIEW PROTOCOL

Date: _____

Time (Start): _____ Time (End): _____

Number of Participants: _____

Interview Protocol

I will now conduct the interview portion of your reading intervention program, which should take less than 30 minutes. Your participation is important and voluntary. You may end this interview at any time with no repercussions. To protect your identity, I will give each of you a pseudonym, such as student 1, 2, and 3, when providing any information to the researcher. Your identity is safe. The purpose of this interview is to determine the effectiveness of using a recreational game in reading instruction to support learners like you, struggling with reading comprehension.

Recreational video games are available to the public and designed and intended for recreational use and purpose. Its creator did not design it for educational purposes. Make sense?

I will now ask you a few open-ended questions focused on how To the Moon affected your attitudes and reading comprehension performance. I am going to record our conversation for the researcher. The data you provide is valuable and necessary for him to study this subject. Do you have any questions before we begin?

Interview Script

1. Can you share a time when you asked questions about the commentary while playing the game to accomplish a task?

1.a. How did the questions deepen your understanding of the storyline, characters, and game?

2. Can you give me an example or two when you were required to make correct predictions using the commentary in the game?

2.a. Is this like what you usually do in class?

2.b. How was it different?

3. Did any of you create mental images of the steps you would take in the game given the text you received?
4. Can you give me an example or two of when you had to reread passages, use background knowledge, and ask yourself questions about the commentary in the game to accomplish a particular task or level up?
5. Were you able to connect the game to your personal experiences, ideas in other texts, and society?
6. Give me examples of when you had to make inferences in the video game?
 - 6.a. How was this process similar or different from what you learned in class?
7. How did the game require you to evaluate important details?
8. How often did you come across words you did not know or could not pronounce?
 - 8.a. What did you do in these situations?
 - 8.b. How many of you applied the same reading principles your other teachers and I taught you?

Are there any final questions or comments? This concludes your interview. The researcher will analyze your data to determine if video games help upper elementary students improve their reading comprehension performance in preparation for the annual STAAR. You are free to go. Have a wonderful day!

APPENDIX J

STUDENT ATTITUDES SURVEY

Instrument Type: Survey

Format: The Student Attitudes Survey comprises two parts. In part one, the participants answer 15 close-ended items using 5-point Likert Scales. (1) denotes strongly disagree, while (5) signifies strongly agree. The reading teacher will ask five open-ended semi-structured questions and record the participants' feedback in part two.

Source: Marti-Parreno, J., Galbis-Cordova, A., & Miquel-Romero, M. (2018). Students' attitude towards the use of educational video games to develop competencies. *Computers in Human Behavior*, Vol 81, 366-377. doi: <https://dx.doi.org/10.1016/j.chb.2017.12.017>, © 2018 by Elsevier. Reproduced by Permission of Elsevier.

Close-Ended Items

Original Items	Modified Items
Attitudes (AT)	
<ul style="list-style-type: none">• AT1 – I like the idea to use educational video games to develop my competencies• AT2 – My attitude towards the use of educational video games to develop my competencies is positive	<ul style="list-style-type: none">• AT1 – I like the idea of using video games to develop my reading abilities.• AT2 – My attitude towards using video games to develop my reading abilities is positive.
Relevance (RE)	
<ul style="list-style-type: none">• RE1 – I can link the content of an educational video game designed to develop my competencies to knowledge with which I am already familiar about competencies.• RE2 – The content of an educational video game designed to develop my competencies can be linked to my daily experiences.• RE3 – The content of an educational video game designed to develop my competencies is valuable and worth learning.	<ul style="list-style-type: none">• RE1 – I can link the content of a video game used to develop my reading abilities to what I have already learned in class.• RE2 – The content of a video game used to develop my reading abilities can be linked to my daily experiences.• RE3 – The content of a video game used to develop my reading abilities is valuable and worth learning.

- RE4 – An educational video game designed to develop my competencies can be very helpful to me.
- RE5 – Playing an educational video game designed to develop my competencies will help me to develop my competencies.
- RE6 – I can be motivated to develop my competencies using an educational video game.
- RE4 – A video game used to develop my reading abilities can be very helpful to me.
- RE5 – Playing a video game in reading instruction will help me develop my reading abilities.
- RE6 – I can be motivated to develop my reading abilities using a video game.

Confidence (CO)

- CO3 – I am confident that I can develop my competencies using educational video games.
- CO4 – I am confident that I can apply what I learn about competencies using educational video games to my daily life.
- CO5 – I believe I will learn enough about competencies using educational video games so that I will enhance my competencies.
- CO1 – I am confident that I can develop my reading abilities using video games.
- CO2 – I am confident that I can apply what I learn in reading instruction using video games to my daily life.
- CO3 – I believe I will learn enough about reading fundamentals and strategies using video games so that I will enhance my reading comprehension performance.

Media Affinity (MA)

- MA1 – Playing video games is one of the things I do every day.
- MA2 – Whenever I'm unable to play video games, I really miss it.
- MA3 – Playing video games is important in my life.
- MA4 – I can't go for several days without playing video games.
- MA1 – Playing video games is one of the things I do every day.
- MA2 – Whenever I'm unable to play video games, I really miss it.
- MA3 – Playing video games is important in my life.
- MA4 – I can't go for several days without playing video games.

Self-Efficacy (SE)

- SE1 – Compared with other students in this class I expect to use educational video games to develop my competencies well.
- SE2 – I'm certain I can use educational video games to develop my competencies.
- SE3 – I expect to do very well using educational video games to develop my competencies.

- SE5 – I am sure I can do an excellent job using educational video games to develop my competencies.
 - SE6 – I think I will receive a good grade using educational video games to develop my competencies.
 - SE9 – I know that I will be able to use educational video games to develop my competencies.
-

Open-Ended Items

1. How did you feel about participating in this study knowing you would be playing a video game?
2. What are your thoughts on using To the Moon as a book in this reading intervention program, including in the formative assessments?
 - 2.a. How did the formative assessments compare to the pretest and posttest (e.g., were they harder, easier, not similar, etc.)?
3. What video game would you have picked for this study? Why?
4. What would you have changed about the study?
5. Would you like to play another video game in class or tutoring? Why?

APPENDIX K

CONSENT FORM

UNIVERSITY OF SOUTH CAROLINA

CONSENT TO BE A RESEARCH SUBJECT

Boys, Reading Comprehension, and Video Games: A Mixed-Methods Case Study
Examining the Effects of Using a Recreational Video Game to Improve Reading
Comprehension Performance at an Elementary School in Texas

KEY INFORMATION ABOUT THIS RESEARCH STUDY: A doctoral researcher from the University of South Carolina would like your child to participate in a study to determine the effectiveness of using a recreational video game to support fifth-grade boys struggling with reading comprehension.

The study will occur after school during mandatory reading tutoring. The participants will take a pretest and posttest as part of the study. Each session includes a mini-lesson, guided practice, gameplay, and formative assessment. In the last week of this study, your child will participate in a Student Focus Group Interview and complete a Student Attitudes Survey.

The participants will play To the Moon during gameplay sessions. This video game is rated “E” for everyone and morally, ethically, and culturally appropriate for K-12 settings. It does not contain violence, nudity, or profanity. To the Moon is known for its award-winning storyline and being reading intensive. It is appropriate for your child.

PROCEDURES:

Week(s)	Activity
1	• Pretest.
2-5	• Mini-lesson, Guided Practice, Gameplay Session, & Formative Assessment.
6	• Posttest, Student Focus Group Interview, & Student Attitudes Survey.

DURATION: The study is six weeks long.

RISKS/DISCOMFORTS: The researcher will not interact with your child during the study. There are no anticipated risks.

BENEFITS: Participants may benefit from the research by acquiring reading strategies and increasing their reading motivation.

CONFIDENTIALITY OF RECORDS: The information collected will be confidential throughout this study. Your child's reading teacher will protect their anonymity.

VOLUNTARY PARTICIPATION: Participation in this research study is voluntary. Your child can stop at any time, for any reason, without negative consequence. If they withdraw from the study, their information remains confidential. Your child will need to inform their reading teacher if they wish to withdraw from the study.

You have had the opportunity to ask questions about this study. The reading teacher satisfactorily answered your questions or concerns. You will contact the reading teacher or researcher if you have any questions about your child's participation in this study.

Direct concerns about your child's rights as a research subject to Lisa Johnson, Assistant Director, Office of Research Compliance, University of South Carolina, 1600 Hampton Street, Suite 414D, Columbia, SC 29208, phone: (803) 777-6670 or lisaj@mailbox.sc.edu.

I permit my child to participate in this study. I have a copy of this form for my records.

Sign and date if you DO NOT want your child to participate in this study.

Signature of Parent or Guardian

Date

Signature of Qualified Person Obtaining Consent

Date

APPENDIX L

GRADE 5 READING TEXAS ESSENTIAL KNOWLEDGE AND SKILLS

Literacy Routines (use during Word Study, Reading, and Writing to improve communication)	
Developing and sustaining foundational language skills: listening, speaking, discussion, and thinking	
5.1 Oral language. The student develops oral language through listening, speaking, and discussion.	
Application	Instructional Focus
5.1 <i>communicate ideas effectively through speaking and discussion</i>	5.1(A) listen actively to interpret verbal and nonverbal messages, ask relevant questions, and make pertinent comments 5.1(B) follow, restate, and give oral instructions that include multiple action steps 5.1(C) give an organized presentation employing eye contact, speaking rate, volume, enunciation, natural gestures, and conventions of language to communicate ideas effectively 5.1(D) work collaboratively with others to develop a plan of shared responsibilities

Word Study	
Developing and sustaining foundational language skills: listening, speaking, reading, writing, and thinking	
5.2 Beginning reading and writing. The student develops word structure knowledge through phonological awareness, print concepts, phonics, and morphology to communicate, decode, and spell.	
5.3 Vocabulary. The student uses newly acquired vocabulary expressively.	
Application	Instructional Focus
5.2 <i>demonstrate and apply phonetic knowledge while reading and spelling</i>	<div>Decoding (Reading)</div> <div>↔</div> <div>Encoding (Writing)</div>
	5.2(A) demonstrate and apply phonetic knowledge by: (i) decoding words with consonant changes, including /t/ to /sh/ such as in select and selection and /k/ to /sh/ such as music and musician ↔ 5.2(B) demonstrate and apply spelling knowledge by: (ii) spelling words with consonant changes, including /t/ to /sh/ such as in select and selection and /k/ to /sh/ such as music and musician (R)
	(ii) decoding multisyllabic words with closed syllables; open syllables; VCe syllables; vowel teams, including digraphs and diphthongs; r-controlled syllables; and final stable syllables ↔ (i) spelling multisyllabic words with closed syllables; open syllables; VCe syllables; vowel teams, including digraphs and diphthongs; r-controlled syllables; and final stable syllables (R)
	(iii) decoding words using advanced knowledge of syllable division patterns ↔ (iv) spelling words using advanced knowledge of syllable division patterns (S)
	(iv) decoding words using advanced knowledge of the influence of prefixes and suffixes on base words ↔ (v) spelling words using knowledge of prefixes (S) (vi) spelling words using knowledge of suffixes, including how they can change base words such as dropping e, changing y to i, and doubling final consonants (R)
	(v) identifying and reading high-frequency words from a research-based list
	(iii) spelling multisyllabic words with multiple sound-spelling patterns (S)
5.3 <i>use skills to support strategies for determining the meaning of unknown words while reading</i>	5.3(A) use print or digital resources to determine meaning, syllabication, pronunciation, and word origin (S) 5.3(B) use context within and beyond a sentence to determine the relevant meaning of unfamiliar words or multiple-meaning words (R) 5.3(C) identify the meaning of and use words with affixes such as trans-, super-, -ive, and -logy and roots such as geo and photo (S) 5.3(D) identify, use, and explain the meaning of adages and puns (S)

Shared Reading										
Tools to Know ⑧										
Developing and sustaining foundational language skills: listening, speaking, reading, writing, and thinking										
5.3 Vocabulary. The student uses newly acquired vocabulary expressively.										
5.4 Fluency. The student reads grade-level text with fluency and comprehension.										
Comprehension skills: listening, speaking, reading, writing, and thinking using multiple texts										
5.6 Comprehension. The student uses metacognitive skills to both develop and deepen comprehension of increasingly complex texts.										
Reading Process: Thinking Within the Text							Comprehension: Thinking with the Text			
5.4(A) use appropriate fluency (rate, accuracy, and prosody) when reading grade-level text	5.6(A) establish purpose for reading assigned and self-selected texts	5.3(B) use context within and beyond a sentence to determine the relevant meaning of unfamiliar words or multiple-meaning words (R)	5.6(B) generate questions about text before, during, and after reading to deepen understanding and gain information	5.6(C) make and correct or confirm predictions using text features, characteristics of genre, and structures (S)	5.6(D) create mental images to deepen understanding	5.6(I) monitor comprehension and make adjustments such as rereading, using background knowledge, asking questions and annotating when understanding breaks down	5.6(E) make connections to personal experiences, ideas in other texts, and society (R)	5.6(F) make inferences and use evidence to support understanding (R)	5.6(G) evaluate details read to determine key ideas (R)	5.6(H) synthesize information to create new understanding [Informational] (R)
Ways to Show: Thinking About the Meaning										
Multiple genres: listening, speaking, reading, writing, and thinking using multiple texts										
5.8 Literary elements. The student recognizes and analyzes literary elements within and across increasingly complex traditional, contemporary, classical, and diverse literary texts.										
5.9 Genres. The student recognizes and analyzes genre-specific characteristics, structures, and purposes within and across increasingly complex traditional, contemporary, classical, and diverse texts.										
5.10 Author's purpose.										
Application	Instructional Focus	Fiction ⑧	Poetry	Drama	Informational ⑧	Argumentative	Multimodal/Digital			
5.8/5.9/5.10 comprehend the author's purpose and meaning in increasingly complex texts and in multiple genres; analyze the relationships among literary elements and structures and how they contribute to the overall meaning	Genre Characteristics	5.9(A) demonstrate knowledge of distinguishing characteristics of well-known children's literature such as folktales, fables, legends, myths, and tall tales (S)	5.9(A) demonstrate knowledge of distinguishing characteristics of well-known children's literature such as folktales, fables, legends, myths, and tall tales (S)	5.9(A) demonstrate knowledge of well-known children's literature such as folktales, fables, legends, myths, and tall tales (S)	5.9(D) recognize characteristics and structures of informational text, including: (ii) features such as insets, timelines, and sidebars to support understanding (S)	5.9(E) recognize characteristics and structures of argumentative text	5.9(F) recognize characteristics of multimodal and digital texts			
			5.9(B) explain the use of sound devices and figurative language and distinguish between the poet and the speaker in poems across a variety of poetic forms (S)	5.9(C) explain structure in drama such as character tags, acts, scenes, and stage directions (S)						
	Overall Meaning	5.10(A) explain the author's purpose and message within a text (R)	5.10(A) explain the author's purpose and message within a text (R)	5.10(A) explain the author's purpose and message within a text (R)	5.10(A) explain the author's purpose and message within a text (R)	5.10(A) explain the author's purpose and message within a text (R)	5.10(A) explain the author's purpose and message within a text			
		5.8(A) infer multiple themes within a text using text evidence (S)	5.8(A) infer multiple themes within a text using text evidence (S)	5.8(A) infer multiple themes within a text using text evidence (S)	5.9(D) (i) [recognize] the central idea with supporting evidence (R)	5.9(E) (i) identifying the claim (R) 5.9(E) (iii) identifying the intended audience or reader (S)				
	Analysis for Deeper Meaning	5.8(C) analyze plot elements, including rising action, climax, falling action, and resolution (R)	5.8(C) analyze plot elements, including rising action, climax, falling action, and resolution (R)	5.8(C) analyze plot elements, including rising action, climax, falling action, and resolution (R)	5.9(D) (iii) [recognize] organizational patterns such as logical order and order of importance (S)	5.9(E) (ii) explaining how the author has used facts for or against an argument (R)	(refer to the genre)			
		5.8(B) analyze the relationships of and conflicts among the characters (R)	5.8(B) analyze the relationships of and conflicts among the characters (R)	5.8(B) analyze the relationships of and conflicts among the characters (R)						
		5.8(D) analyze the influence of the setting, including historical and cultural settings, on the plot (S)	5.8(D) analyze the influence of the setting, including historical and cultural settings, on the plot (S)	5.8(D) analyze the influence of the setting, including historical and cultural settings, on the plot (S)						

Author's Craft: Thinking About the Writing							
5.10 Author's purpose and craft. The student uses critical inquiry to analyze the authors' choices and how they influence and communicate meaning within a variety of texts. The student analyzes and applies author's craft purposefully in order to develop his or her own products and performances.							
Application	Instructional Focus	Fiction	Poetry	Drama	Informational	Argumentative	Multimodal/Digital
5.10 <i>analyze the authors' choices and how they influence meaning; apply author's craft purposefully in writing and speaking</i>	Point of View	5.10(E) identify and understand the use of literary devices, including first- or third-person point of view (S)	5.10(E) identify and understand the use of literary devices, including first- or third-person point of view (S)	5.10(E) identify and understand the use of literary devices, including first- or third-person point of view (S)			5.10(E) identify and understand the use of literary devices, including first- or third-person point of view
		5.10(B) analyze how the use of text structure contributes to the author's purpose (S)	5.10(B) analyze how the use of text structure contributes to the author's purpose (S)	5.10(B) analyze how the use of text structure contributes to the author's purpose (S)	5.10(B) analyze how the use of text structure contributes to the author's purpose (S)	5.10(B) analyze how the use of text structure contributes to the author's purpose (S)	5.10(B) analyze how the use of text structure contributes to the author's purpose
	Structure	5.10(C) analyze the author's use of print and graphic features to achieve specific purposes (S)	5.10(C) analyze the author's use of print and graphic features to achieve specific purposes (S)	5.10(C) analyze the author's use of print and graphic features to achieve specific purposes (S)	5.10(C) analyze the author's use of print and graphic features to achieve specific purposes (S)	5.10(C) analyze the author's use of print and graphic features to achieve specific purposes (S)	5.10(C) analyze the author's use of print and graphic features to achieve specific purposes
		5.10(D) describe how the author's use of imagery, literal and figurative language such as simile and metaphor, and sound devices achieves specific purposes (S)	5.10(D) describe how the author's use of imagery, literal and figurative language such as simile and metaphor, and sound devices achieves specific purposes (S)	5.10(D) describe how the author's use of imagery, literal and figurative language such as simile and metaphor, and sound devices achieves specific purposes (S)			5.10(D) describe how the author's use of imagery, literal and figurative language such as simile and metaphor, and sound devices achieves specific purposes
	Language	5.10(F) examine how the author's use of language contributes to voice (S)	5.10(F) examine how the author's use of language contributes to voice (S)	5.10(F) examine how the author's use of language contributes to voice (S)	5.10(F) examine how the author's use of language contributes to voice (S)	5.10(F) examine how the author's use of language contributes to voice (S)	5.10(F) examine how the author's use of language contributes to voice
		5.10(G) explain the purpose of hyperbole, stereotyping, and anecdote (S)	5.10(G) explain the purpose of hyperbole, stereotyping, and anecdote (S)	5.10(G) explain the purpose of hyperbole, stereotyping, and anecdote (S)	5.10(G) explain the purpose of hyperbole, stereotyping, and anecdote (S)	5.10(G) explain the purpose of hyperbole, stereotyping, and anecdote (S)	5.10(G) explain the purpose of hyperbole, stereotyping, and anecdote

Independent Reading

5.5 Self-sustained reading. Developing and sustaining foundational language skills: listening, speaking, reading, writing, and thinking. The student reads grade-appropriate texts independently.

5.5(A) self-select text and read independently for a sustained period of time

Responding to Text (applied to both Shared Reading and Independent Reading)

5.7 Response skills: listening, speaking, reading, writing, and thinking using multiple texts. The student responds to an increasingly challenging variety of sources that are read, heard, or viewed.

Ways to Show (Response Skills)

5.7(A) describe personal connections to a variety of sources, including self-selected texts	5.7(B) write responses that demonstrate understanding of texts, including comparing and contrasting ideas across a variety of sources (R)	5.7(C) use text evidence to support an appropriate response (R)	5.7(D) retell, paraphrase, or summarize texts in ways that maintain meaning and logical order (R)	5.7(E) interact with sources in meaningful ways such as notetaking, annotating, freewriting, or illustrating	5.7(F) respond using newly acquired vocabulary as appropriate	5.7(G) discuss specific ideas in the text that are important to the meaning
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Writing	
Composition: listening, speaking, reading, writing, and thinking using multiple texts	
5.11 Writing process. The student uses the writing process recursively to compose multiple texts that are legible and uses appropriate conventions.	
5.12 Genres. The student uses genre characteristics and craft to compose multiple texts that are meaningful.	
Application	Tools to Know (Writing Process) ⓘ
5.12(A) compose literary texts such as personal narratives, fiction, and poetry using genre characteristics and craft	5.11(A) plan a first draft by selecting a genre for a particular topic, purpose, and audience using a range of strategies such as brainstorming, freewriting, and mapping
	5.11(B) develop drafts into a focused, structured, and coherent piece of writing by: <ul style="list-style-type: none"> (i) organizing with purposeful structure, including an introduction, transitions, and a conclusion (R) (ii) developing an engaging idea reflecting depth of thought with specific facts and details (R)
	5.11(C) revise drafts to improve sentence structure and word choice by adding, deleting, combining, and rearranging ideas for coherence and clarity (R)
	5.11(D) edit drafts using standard English conventions, including: (S) <ul style="list-style-type: none"> (i) complete simple and compound sentences with subject-verb agreement and avoidance of splices, run-ons, and fragments (R) (ii) past tense of irregular verbs (R) (iii) collective nouns (S) (iv) adjectives, including their comparative and superlative forms (S) (v) conjunctive adverbs (S) (vi) prepositions and prepositional phrases and their influence on subject-verb agreement (S) (vii) pronouns, including indefinite (S) (viii) subordinating conjunctions to form complex sentences (S) (ix) capitalization of abbreviations, initials, acronyms, and organizations (S) (x) italics and underlining for titles and emphasis and punctuation marks, including quotation marks in dialogue and commas in compound and complex sentences (S) (xi) correct spelling of words with grade-appropriate orthographic patterns and rules and high-frequency words (R)
	5.11(E) publish written work for appropriate audiences
5.12(B) compose informational texts , including brief compositions that convey information about a topic, using a clear central idea and genre characteristics and craft (R)	5.2(C) write legibly in cursive
5.12(C) compose argumentative texts , including opinion essays, using genre characteristics and craft (R)	
5.12(D) compose correspondence that requests information	

Research (embedded skills throughout Reading and Writing)	
5.13 Inquiry and research: listening, speaking, reading, writing, and thinking using multiple texts. The student engages in both short-term and sustained recursive inquiry processes for a variety of purposes.	
Application	Instructional Focus
5.13 <i>use research skills to plan and present in written, oral, or multimodal formats</i>	5.13(A) generate and clarify questions on a topic for formal and informal inquiry 5.13(B) develop and follow a research plan with adult assistance 5.13(C) identify and gather relevant information from a variety of sources 5.13(D) understand credibility of primary and secondary sources 5.13(E) demonstrate understanding of information gathered 5.13(F) differentiate between paraphrasing and plagiarism when using source materials 5.13(G) develop a bibliography 5.13(H) use an appropriate mode of delivery, whether written, oral, or multimodal, to present results

(Texas Education Agency, 2021)

APPENDIX M

CODES FROM FIRST CODING CYCLE

- Had to look for stuff
- You can discover new places in To the Moon
- Find different characters
- Can find different rooms
- Finding the funny room
- You can find stuff in To the Moon
- Can find keys
- Can find other things
- He has a lot of stress
- To The Moon was a good mystery book
- Interesting stories
- Reminded them of their dad who passed away
- Good game
- Made him think of when he helped family members
- Made them think of their dad
- A good book
- In his mind
- Liked using To the Moon as a book
- Must remember what you read
- It is fun
- Cannot go back and reread passages
- Did not get far in game
- Can go through the game's text fast
- Would help read more
- Looking for the page
- In the bed
- Same two people
- Funny room
- Accessing their memories
- It will help you read more

- Was sad
- A very good book
- It is fast
- To the Moon video game is fun
- Can play the video game at home
- To the Moon was a fun game
- Wished he could play To the Moon at home
- Liked To the Moon's storyline
- To the Moon relieved stress
- Liked To the Moon better than an actual book
- To the Moon is a different type of video game
- Really liked playing To the Moon
- To the Moon is like Roblox
- He liked playing To the Moon
- Making inferences in video games is different
- Remembered making inferences in the game
- Making predictions in the game was different
- Had to make correct predictions in the game
- Asking questions helped them understand the game more
- Similar about the reading
- Came across words they did not know or could not pronounce
- Context clues
- Could not remember making inferences
- Reading and answering questions
- Using background knowledge
- Created mental images in the game
- Did not create mental images in the game
- Trying to lookup word
- Applied the same reading principles
- Preferred the game over a book
- Must remember more
- Play a reading intensive game over a book
- Really like using To the Moon as a book
- Liked reading about what was going on in the game
- At some of the parts in the game
- Going through the text fast made the assessments harder
- Got all the questions wrong
- Helped understand the story

- Formative assessments focused on the storyline
- Formative assessments were easier than pretest & posttest
- Formative assessments were harder if not at a particular part
- Formative assessments were kind of easy
- Formative Assessments were kind of hard
- Formative assessments were harder than Pretest & Posttest
- Formative assessment questions were easier
- The pretest was harder
- Formative assessments were a little hard
- Formative assessments were hard if you did not get to certain parts
- The pretest and posttest were easier than the formative assessments
- The formative assessments were more difficult
- Play a video game in class
- Hooked them
- Want to play another video game in class or tutoring
- Playing video games in class is something different
- Would like to play another video game in class
- Liked working together during gameplay sessions
- Agreed to participate in the study
- Wanted to participate in the study
- Did not mind participating
- Was not mad
- Willing to try the game
- Happy
- Did not mind playing the video game
- No other games they would have picked
- Would not have changed anything about the study
- Add an action video game to the study
- Liked the study as it was
- Would not change anything about the study
- Use video games in class
- Would like to play another game in class
- Liked not having to share a device
- He felt good participating in the study
- Was excited to play a video game in class
- Thought the reading intervention program was fine the way it was
- Thought the reading intervention program was fine
- Animal Crossing is like a book

- A gear that fights
- It is like a chainsaw
- Can have several weapons
- Can add subtitles to the video game
- His cousin likes
- Gears of War
- Call of Duty
- Animal Crossing
- Mario Kart
- Rocket League
- Minecraft
- Prefer to keep playing To the Moon over other video games
- Could be a reading game
- Video games like To the Moon
- Do not have to constantly read
- It is action
- It is not a reading intensive video game
- You can be stealthy
- An action reading game
- It has mysteries
- The game has soccer and cars
- Likes soccer and cars
- Can play different games in Roblox
- Get different blocks in Roblox
- Playing video games are fun
- Video games are fun
- Video games have multiple purposes
- Playing video games can be a project
- Video games can give you some creativity
- Video games can give you a creative mind
- Playing video games gives you something to do
- Can use video games during independent reading time
- Can play a video game during free time
- Video games make time go by faster
- Video games can relieve stress

APPENDIX N

INITIAL THEMES, CATEGORIES, AND CODES

Themes	Categories
1 – To the Moon’s Effectiveness on Reading Comprehension Performance	<p>Applying Reading Comprehension Strategies during Gameplay</p> <ul style="list-style-type: none"> • Had to make correct predictions in the game • Remembered making inferences in the game • Asking questions helped them understand the game more • Came across words they did not know • Applied reading comprehension principles in the game • Connected the game to personal experiences • Making predictions in the game was different than traditional text • Created mental images in the game • Reading in video games is similar compared to traditional text • Used context clues in the game • Reading and answering questions • Making inferences in video games is different • Used background knowledge • Did not create mental images in the game • Could not remember if they made inferences • Tried to lookup unknown words <p>Attitudes on the Formative and Summative Assessments</p> <ul style="list-style-type: none"> • Formative Assessments were Easier than Pretest and Posttest • Formative Assessments were Hard

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- Formative Assessments were harder than Pretest and Posttest
 - Had to remember what you read in the game
 - Only got to certain parts in the game
 - Formative assessments hard if you did not get to a particular part in the game
 - Going through the text too fast made the assessments harder
 - Got all the questions wrong
 - The formative assessments helped them understand the story
 - Formative assessments focused on the storyline
 - Cannot go back and reread passages

2 – Boys' Attitudes on Video Games

To the Moon as a book

- Preferred the game over an actual book
- Able to recall specific parts in the storyline
- Considered it a good book
- Thought To the Moon was a different type of video game
- Liked reading about what was going on in the game
- Had an interesting storyline
- Liked To the Moon's storyline
- Can go through the game's text fast

What they liked about playing video games

- Playing video games is something they like doing
 - Able to play a video game in class
 - Increases Participation
 - They are fun
 - Did not have to share devices
 - Relieves Stress
 - Enhances creativity
 - Makes the time go by faster
 - Can learn something
 - Can help them read more
 - Can play the game at home
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- It is something different to do
- They can be Collaborative
- Can use during free time
- They can be used in projects
- Can use during independent reading

Video games they want to play

- Hidden Object Games
 - Gears of War
 - Rocket League
 - Keep playing To the Moon
 - Roblox
 - A game that is not reading intensive
 - Animal Crossing
 - Call of Duty
 - Mario Kart
 - Minecraft
 - An action reading game
 - An action video game
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