

The Pennsylvania State University

The Graduate School

College of Education

**AN EXAMINATION OF TEACHER EXPERIENCES  
USING EDUCATIONAL DIGITAL GAMING IN THE CLASSROOM**

A Dissertation in

Learning, Design, and Technology

by

Michael F. Petner Jr.

© 2018 Michael F. Petner Jr.

Submitted in Partial Fulfillment  
of the Requirements  
for the Degree of

Doctor of Philosophy

August 2018

The dissertation of Michael F. Petner Jr. will be reviewed and approved\* by the following:

Susan M. Land  
Director of Department of Learning & Performance Systems  
Dissertation Advisor  
Chair of Committee

Wei-Fan Chen  
Associate Professor of Education (Information Sciences & Technology)

Edgar P. Yoder  
Professor Extension Education (Agricultural Sciences)

Gabriela T. Richard,  
Assistant Professor of Education (Learning, Design, and Technology)

\*Signatures will be on file in the Graduate School.

## ABSTRACT

This dissertation is a qualitative research investigation that explores the educational experiences and perceptions of public school teachers (K-8) as they relate to the usage of educational video games in their classrooms. To shed light on the phenomenon, the study focused on providing in-depth descriptions of public school teacher narratives of their educational game-based experiences and what they perceive as values and limitations. Phenomenological research methods based on the works of van Manen (1997) and Moustakas (1994) were used to collect and analyze the data. Data collection was undertaken primarily through in-depth, semi-structured interviews. The interviews of fifteen public school teachers describing their experiences and perceptions of educational video game usage were audio and video recorded until a point of saturation.

Findings reveal teachers' experiences with educational video games, including the types of educational video games used, notably: 1.) Kahoot, 2.) IXL, and 3.) Quizlet. In addition, key themes arose from the interview data. These themes detail challenges teachers faced to use video games and include: 1.) Allocation and Lifespan of Devices, Limitations of Resources, and Lack of Funding; 2.) The Struggle for Time; and 3.) Video Games Disrupting the Managed Classroom. The findings of this study highlight the inherent complexities of educational video game usage, performance gaps, and bridges. In this context, performance gaps are obstacles that pose challenges for game-using teachers. For example, if the bandwidth is strained from too many teachers on the server, this would qualify as a gap that interferes with the teacher's ability to use games as intended; thus, a performance gap. The bridges teachers build are described as methods or techniques participants have employed to resolve or work-around said gaps.

## TABLE OF CONTENTS

LIST OF FIGURES .....	vi
ACKNOWLEDGEMENTS .....	vii
Chapter 1 – Introduction.....	1
The Study Purpose.....	3
Chapter 2 - Literature Review.....	6
Terms & Constructs: Entertainment and Educational Video Games.....	6
Video Games and Learning.....	12
Teachers and Other Forms of Technology.....	18
Mobile Learning: Handheld Computers & Mobile Phones.....	19
Social Networks and Digital Media.....	21
The Lifeworld of Educators .....	24
The Psychosocial Perspective .....	25
Acknowledging Themes of Violence .....	25
The Organizational Perspective: How School Policies Could Be a Factor.....	27
Chapter 3 - Research Design .....	33
Introduction .....	33
Methodological Orientation .....	33
Participants and Sampling .....	36
Procedures.....	36
Interviews: How Interview Data is Used in Qualitative Research .....	37
The Method .....	39
Data Triangulation .....	41
Data Analysis .....	42
Theoretical Lens .....	46
Ethical Considerations .....	46
Researcher Identity .....	47
Summary .....	49
Chapter 4 – Results and Discussion .....	50
Biographical Sketches.....	50
Development of Themes .....	53
Teacher, School, and Student Context....	54
What Teachers Have To Say About Video Games .....	57
Let the Games Begin .....	60
Kahoot .....	61
IXL .....	62
Quizlet .....	65
Miscellaneous Other Games.....	66
ABCya.....	66
Study Island.....	67

The Lure of the Labyrinth.....	67
Moderation .....	68
Performance Gaps and the Bridges Teachers Build .....	69
Theme 1: Allocation and Lifespan of Devices, Limitations of Resources, and Lack of Funding..... <sup>1v</sup>	70
Theme 2: The Struggle for Time.....	80
Theme 3: Video Games Disrupting the Managed Classroom.....	86
Chapter 5 – General Discussions and Implications.....	95
Summary and Discussion Pertaining to the Research Question.....	95
The Interplay Between Educational Video Games and Teacher Lifeworlds.....	96
Implications of Themes Pertaining to Learning, Design, and Technology.....	100
Games as Drill and Practice Pedagogy.....	100
Reconsidering Drill and Practice: Student Buy-In: Motivating and Engaging Learners.....	101
Classroom Management.....	102
Evaluation, Assessment, and Meeting Metrics.....	103
Other Considerations.....	104
Limitations and Implications for Future Research.....	105
Conclusion.....	106
Appendix.....	108
References.....	111

## LIST OF FIGURES

Figure 1: Profile of Participants.....	51
Figure 2: Technology Allotment for Each Teacher.....	70

## ACKNOWLEDGMENTS

The completion of a dissertation is the ultimate test of one's mettle. I attribute my success to my faith and devotion in my Lord and Savior, Jesus Christ. I also owe many, many thanks to the following individuals.

To my mom, Theresa, and my dad, Michael Sr., I want to thank you both for raising me in the Catholic faith. Each and every day, we have prayed for strength and resolve to overcome the obstacles faced along this tireless journey. You have always been there for me during the hardships. You have both been my unwavering supporters. Words cannot adequately express just how grateful I am to you for the countless sacrifices you have made to help get me here. You raised me to never give up and constantly reminded me that I am capable of anything I set my mind to. Thank you, always, mom and dad. I love you!

To my sister, Rebecca—thank you for propelling me through the hardships. You've always managed to squeeze into our conversations: "How's the dissertation going?" Thanks for always keeping my head in the game and my eye on the prize! I'm blessed to have a loving and supportive sister that is so invested in her brother's success. I love you, Becky!

I want to thank my grandparents on the Schwarz and Petner sides of the family—rest in peace; I love you always. Grandpop Schwarz: you taught me that, no matter how big or small of a task, I should always aim to do it right. I have always held onto that lesson and reflected on it often. It has been ingrained in who I am, today. Gram: I miss you so very much. You were always a bright spot in my day when things got tough. No matter when I saw you, you always had a smile on your face. You always managed to bring joy when things seemed so dim. You were my second mom—you helped raise me to become the man that I am today. I love you and know you'll be looking down from heaven during my defense. Grandmom and Grandpop Petner:

thank you both for supporting my journey as an educator. I will continue to strive to make you both proud! I love and miss you both!

To my friend and colleague, Shawn Vashaw: thank you for never giving up on me. Thank you for letting me pick your brain, turn to you for advice, and the countless hours of exchanges shared during this quest called graduate school. You are a true friend and inspiration. I can't wait to don the legendary graduation robes and, in a true Warcraft fashion, chant "For the Horde!" We are brothers in arms—on the digital and scholarly fronts. We've got the battle scars to prove it!

There are so many faculty members of Penn State that I also wish to thank. Thank you to Ali Carr-Chellman, who helped set me on this journey. Thank you to Kyle Peck, who picked up the torch as my chair, following Ali's departure to the University of Idaho. And thank you, Susan Land, who carried the torch to the finish line and helped me reach my full potential. Many thanks to Gabriela Richard, who offered wonderful insights into the world of video games. A great many thanks, as well, to Ed Yoder—you are a tour de force in academia. Additionally, I wish to express my gratitude to Wei-Fan Chen for taking on the fourth seat of my ever-changing committee dynamic. Lastly, on the Penn State front, I wish to thank Jennifer McLaughlin, Carol Fantaskey, and Nancy Crowder. I know it's been a long and winding road to the defense and I could not have made it without your expertise as administrative support coordinators!

I'd like to conclude by expressing my gratitude to a host of family and friends who have also helped me on this journey. To my dear friend, Father Jon Thomas, thank you for the encouragement and unwavering support. You always managed to put things into perspective—reminding me of God's great plan for me, in spite of the many adversities faced along the way. To my friend, Philip Neris, and his mom, Yolanda Perez: thank you both for your gestures of



kindness and generosity. You are true friends and I am forever grateful to the both of you. To Linda Bemiller—you helped me find strength and continued to cheer me on throughout the span of this venture! Thank you and God bless you, my dear friend! To my Aunt MaryEllen: thank you for letting me work in your house—the peace and quiet was conducive to a great many productive sessions! To my cousin, Jonathan Gelner and my pal, Johnny Alayo: thank you both for the unwavering support, as I encountered bumps in the road. You've certainly helped me get through some rough patches and I'm blessed to call you my friends.

Finally, I wish to thank the teachers who participated in my study. I am sincerely indebted to you for taking the time to meet with me, open up to me, and share so many insightful stories from your classrooms. Your voices...your experiences are the lifeblood of my research. From one educator to another, I am truly grateful to each and every one of you!

## *Chapter 1 – Introduction*

According to a 2015 study conducted by the Entertainment Software Association, in the United States, over 55% of the population engages in playing video games with an average player age of 35 years (Entertainment Software Association, 2015). Other studies (Granic, Lobel, & Engels, 2014; ISFE, 2016) cite that more than 70% of children and teenagers across the European Union, and over 90% in the United States, play video games. In addition, these figures keep growing with the advancement of smartphones and other mobile technologies doubling as potential gaming platforms (McCauley, Kopanidis, & Farrelly, 2016). In light of such numbers, one can infer that video games are a popular avenue of entertainment. Educational institutions have also noticed these trends and have responded by integrating video games into their own curricula.

When it comes to the topic of video games, there are critics and defenders; those who oppose games for their inappropriate or unethical themes (Kutner & Olson, 2011; Van Cleave, 2010; Deterding 2014) and those who advocate for games because of their apparent ability to motivate and yield unique learning opportunities (Granic, Lobel, & Engels, 2014; McGonigal, 2011; Prensky, 2005; Shute, et al, 2015).

Ottenbreit-Leftwich (2014) makes the argument that technology needs to support the kinds of instruction believed to be the most powerful. Academics have long contended that video games are a fitting instructional tool and that learning is a noteworthy outcome of playing video games (Gee, 2016; Greitemeyer & Mügge, 2014; Gros, 2015; Ke, 2016; McGonigal, 2011; Novak, Johnson, Tenenbaum & Shute, 2016). Those in the "pro" camp argue in favor of video games for a number of reasons. They cite that playing video games correlates with improved learning performance (Brom, Preuss, & Klement, 2011; Hwang, Wu, & Chen, 2012), as well as

improved motor skills (Bauer, Kettschau, Brücher, Bodendorf, Skibbe, Rashid, & Franke, 2016; George, Rohr, & Byrne, 2016), enhancing a variety of brain functions (Polat, 2016), including decision making (Hilliard, Buckingham, Geldhof, Gansert, Stack, Gelgoot, Bers, & Lerner, 2016), and helping to address psychological problems, functioning as a treatment for depression (Cabot & Wilkinson, 2016). In addition, they contend that video games are intrinsically motivating (Hanus & Fox, 2015, Rigby & Ryan, 2011), fostering socialization and collaboration (Magnussen, Hansen, Planke & Sherson, 2015), as well as offering challenges and a personal sense of accomplishment (Klimmt & Hartmann, 2006).

Findings by Barata, Gama, Jorge, and Gonçalves (2013) suggest that the integration of video games into classroom settings can produce effects that can be complementary to instructional strategies and improve upon traditional teaching tools. Notable areas that have been found to show positive gains in educational settings include improved sense of autonomy (DeRosier & Thomas, 2018), engagement (Lindgren, Tscholl, Wang, & Johnson, 2016), motivation (Hanus & Fox, 2015), enhanced visual perception and attention (Green & Bavelier, 2012), as well as improvements in retention and transfer performance (Sáez-López., Román-González & Vázquez-Cano, 2016).

In contrast, some scholars contend that video games do not belong in the classroom setting and are actually a contributing *source* for a wider array of societal problems (Anderson, 2004; Ferguson & Colwell, 2016; Gallimberti, Buja, Chindamo, Rabensteiner, Terraneo, Marini, Pérez & Baldo, 2016; Griffiths, Van Rooij, Kardefelt-Winther, Starcevic, Király, Pallesen, Müller, Dreier, Carras, Prause & King, 2016; Slater, Henry, Swaim, & Anderson, 2003). Much of the educational research thus far published on gaming has focused on violence, addiction, and other negative video game effects (Ferguson, 2015; Gentile, Swing, Anderson, Rinker, &

Thomas, 2016; Gerber, Abrams, Onwuegbuzie & Bengue, 2014; Griffiths, Mark, Kuss, & King, 2012; Groves & Anderson, 2016). Many of these arguments suggest that video games have serious negative consequences on the players, their families, and the societies in which they live. The news and associated media also tend to favor reporting on the negative effects of video games (Bushman, 2016; Reeves, Yeykelis & Cummings, 2016), giving the debate a more strident tone.

In spite of the conflicting opinions, reports of schools integrating video games into their curricula have become increasingly frequent (Maguth, List, & Wunderle, 2015; Pusey & Pusey, 2016; Schrader, Deniz, & Keilty, 2016). According to Gee (2014), among K-12 education settings, video games have increasingly been used as learning and literacy tools. This is a new transition for administrators, educators, and students, alike. In light of such changing dynamics, the prospect for research is ripe.

### **The Study Purpose**

In 2003, De Aguilera & Mendiz noted that video games were a part of our broader culture, but not really a part of the school culture. Five years later, in 2008, there were reports that some educators were beginning to acknowledge the educational potential in gaming, as long as it was used appropriately (Moreno-Ger, Burgos, Martínez-Ortiz, Sierra, & Fernández-Manjon, 2008). Another five years passed and video games gained a sturdier footing in our schools, though Schultheiss and Helm (2013) reported that some teachers were skeptical about video game use. Video games have been steadily earning a reputation as a viable instructional tool within academic settings, offering unique and engaging learning experiences for students and teachers, alike.

It has been proposed that issues of teacher change are central to any discussion of technology integration. Generally, when teachers are asked to implement technology to facilitate learning, some degree of change is required along any or all of the following dimensions: (a) beliefs, attitudes, or pedagogical ideologies; (b) content knowledge; (c) pedagogical knowledge of instructional practices, strategies, methods, or approaches; and (d) novel or altered instructional resources, technology, or materials (Fullan & Stieglbauer, 1991) (Ertmer, 2010, p. 2). With these considerations in mind, the purpose of this study is to investigate teacher lifeworlds (Husserl, 2012). The "lifeworld", according to Husserl, is understood as the pre-theoretical world—the immediate, pre-reflective consciousness of individual lives. The focus of this phenomenological inquiry is to collect and review teacher perceptions, perspectives and understandings as they pertain to the introduction and application of educational digital games in their classrooms. At its core, phenomenology refers to the perceived meaning of an event by a person or group, rather than examining the event as it exists externally (Merleau-Ponty & Smith, 1996). The research question is as follows: **What are the experiences of teachers who use educational video games in their classrooms?**

The rationale for this study is based on the fact that there are limited first-hand accounts from teachers about their experiences with video games in their classrooms. Many of the scholarly studies currently available either touch upon the effectiveness or ineffectiveness of video games as they apply to learner performance and improvement, but first-hand accounts from those actually using video games as a teaching tool are lacking. As has been established, the notion of video game integration in schools has been steadily gaining acceptance. As technology has become more sophisticated, so too have the approaches of educators, which includes the application of video games for educational purposes. Given that, what are teacher

attitudes about video game use in their classrooms? Have their attitudes changed as the presence of video game has reached an elevated state in their schools? These are the types of questions this research seeks to answer.

The results of this study will be beneficial to educators interested in integrating video games into classrooms and policy makers who seek to craft a different approach to curriculum and instruction. One can argue that teachers are gatekeepers that can either empower students by engaging them in new methods of student-centered learning or continue adhering to traditional approaches of instruction. In conducting this study, we may better understand the values and goals of teachers using video games in their classrooms, as they are the ones engaging students with this form of technology. This study used data from multiple interviews, observations, and field notes in order to better understand the experiences of teachers with video games in their respective schools.

## *Chapter 2 - Literature Review*

"A teacher affects eternity; he can never tell where his influence stops."

*Henry Brooks Adams*

A gap exists in the academic literature concerning teacher attitudes about video games. A thorough exploration of the literature was conducted using online resources and scholarly databases and a well-stocked academic library at a major institution of higher learning. This chapter details the findings.

In conducting this literature review, some articles were found detailing how a select number of educators are currently using video games in their classrooms—mostly falling into the report or case study kind of publication. The majority of published literature on the topic of video games in education settings, serious games, etc. address the gains or shortcomings of said implementation, with a limited selection of teachers recounting their experiences using games in the classroom. As a result, this literature review was only successful at drawing small elements of teacher experiences from current literature in the area.

In order to gain a better feel for the experiences of those that have participated in the adoption of video game technologies in schools, it is useful to look at examples of other associated technological elements that have been blended into teacher lifeworlds (Schutz & Luckmann, 1973) in recent years, including video games, but also cell-phones, digital cameras, and online and social media. We begin by looking at data pertaining to video games, as they are the key focus of this phenomenological study.

### *Terms & Constructs: Entertainment and Educational Video Games*

There's a common theme among the passions of today's children: they care about video games (Gros, 2015; Lu, Buday, Thompson & Baronowski, 2016; Reynolds, McAllister, &

Ruggill, 2016). They're motivated by video games (Birk, Atkins, Bowey & Mandryk, 2016; Woo, 2014) and the video game industry, schools, and academic scholars alike are aware of this potential (Donovan, 2010; Downes & Bishop, 2012; Foster, Shah, & Duvall, 2016). The popularity of video games is increasing and, with more avenues to experience such content (phones, augmented reality, handhelds, tablets, laptops, increasingly sophisticated consoles, cloud gaming etc.), the opportunities for users to engage with such media is on the rise, too.

To better frame this study, a clear definition of video games must be established. Video games were originally designed for the purpose of entertainment and act as a venue that satisfies the human desire for play, though they have also recently emerged as a tool to facilitate learning. Video games are defined as digital games conducted largely through electronic computation that are guided by rules, require human input, and offer variable outcomes related to given inputs, such as winning or losing (Redmond & Seider, 2012). Video games hold the potential to exert a powerful influence upon participants through their content, procedural rhetoric, and the ecosystem that surrounds game play (Bogost, 2007; Koo and Seider 2010).

The content of a video game typically—though not always—includes narrative elements, such as plot, characters, and themes, as well as design elements, such as graphics, audio, dialogue, soundtrack, and varying degrees of gameplay mechanics. The embedding of plots and themes, as well as experiences and objectives within a video game's content allows players to experience guided decision-making, thus deepening their own personal commitment and intrinsic motivation to play the game. In this way, video games, like other forms of mass media, act as message transmitters—containing and conveying values, attitudes, and moral systems that may influence an individual's personal opinions, beliefs, and actions (Koo & Seider, 2010). Unlike television and film, literature and other forms of passive media, video games stand out by



presenting participants with *immersive* fantasy elements, as well as elements that foster intrinsic motivation.

Video games tap into the nature of play, which is an enduring facet of the lived experience. Johan Huizinga (1950), author of *Homo Ludens* (Latin for “Man the Player”), argues that the concept of play is not only a significant social function, but also one that shapes who we are as human beings. A significant element of Huizinga's work is that this form of engagement is both fun and enjoyable; it is a voluntary act that one engages in of his or her own volition. We play video games for the same reasons.

There exist other underlying facets of video game design that also contribute to their appeal. According to Malone (1981) the elements of challenge, fantasy, and curiosity are key aspects of game design that foster engagement. Findings by Dickey (2006), whose research focused on Massively Multiplayer Online Role Playing Games (MMORPGs) recognized inherent motivating factors within the game design, including "choice, control, collaboration, challenge, and achievement" (p. 265) in addition to "elements within the design of a narrative environment which help scaffold players in the gameplay experience by providing a cognitive framework for problem-solving and by fostering metacognitive skills" (p. 265). Other such factors to explain why we play deal with concepts of *choice* (pursuing a task for one's own sake), *novelty-seeking and risk-taking* (taking on new challenges in areas that the learner understands very little about, yet engages in "behaviors that can result in both catastrophe and significant growth" (p. 20), *enjoyment* (providing a positive environment wherein a "sense of play and excitement....resulted in significant growth" (p. 20), and the importance of invoking internal *passion and shared passion* or "leveraging of affinities" (Scherer, 2006). Video games can be

simple or complex, but it is the combination of these qualities which make for memorable and enjoyable game-play experiences.

The Joan Ganz Cooney Center study (2013) uses the broad title of “digital games” describing them as "ones that can be played on dedicated consoles (TV-based or handheld), computers, mobile devices (tablets and phones), and in social media environments (such as Facebook)" (p. 26). In addition, the Cooney Center was inclusive in their definition—covering games created for instructional, as well as entertainment purposes (Pressey, 2013).

On that note, it is useful to address some of the differences between entertainment and educational video games. Commercial video games are typically designed for entertainment purposes, these are the types of games that are typically developed by major publishers, such as Sony, Microsoft, and Nintendo. They can be purchased off-the-shelf or as a digital download. Among these games, there are numerous genres with varying degrees of popularity, of which the Entertainment Software Association (ESA) has published sales, demographic, and usage data for 2015.

The types of commercial games that are played vary greatly (Egenfeldt-Nielsen, Smith, & Tosca, 2016). Among the notable percentages of *best-selling* game genres for 2015, First-person shooters (FPS) were the highest selling genre that year, contributing to 24.5% of total video game sales; FPS titles include titles such as the Call of Duty series, Counter-Strike, Halo, Unreal Tournament, and Doom. Action games, such as Destiny, the Far Cry series, Assassin's Creed, the Tomb Raider franchise, the Super Mario series, and Metal Gear ranked second at 22.9% and sport games placed third with 13.2%. These sales numbers, however, did not indicate time spent playing after the time of purchase. However, supplemental data was collected for frequency of usage, which revealed a contrast in the types of games people play more routinely.

As for the types of games *played most often*, 31% were social in nature with the next most popular genre at 30% being action games. Meanwhile, video games that were of the Puzzle/ Board Game/ Card Game/ Game Show variety accounted for another 30% of frequent play. Another notable finding: of the games rated by the Entertainment Software Rating Board (ESRB) in 2015, 37% received an E (Everyone) rating, 23% received an E10+ (Everyone 10+) rating, 29% received a T (Teen) rating, and 11% received an M (Mature) rating (p. 8). In light of this, one can interpret that commercial game developers aim to cater to a broader consumer audience—one of all-ages—incorporating elements of socialization, action, and strategy to hook players and keep them entertained.

Turning to educational games, these are the types of games designed to meet a specific learning objective. They tend to fit into one of three categories: *simulations*, which attempt to model a system in a manner that is consistent with reality (Heinich, et al. 1996), *drill and practice* games, which are designed for factual and procedural recall (Jonassen 1988), or *short / simple games*, which are designed to be simple and ubiquitously available across subjects and mediums of delivery (Advertainment & Rise, 2016). These varieties of educational games are primarily used in the military, schools, and the learning industry (Routledge, 2016). To further make the distinction between educational games and their commercial counterparts, Abt (1975) coined the term "serious games", which rests on the idea of using games for purposes other than fun, citing "these games have an explicit and carefully thought-out educational purpose and are not intended to be played primarily for amusement." (Abt, 1975, p. 9). Reflecting on such definitions, one might interpret serious / educational games as a vessel to convey information with some semblance of an entertaining video game.

Referring back to findings by the Cooney Center study, 81% of K-8 game-using teachers (GUTs) reported using titles created for educational purposes, such as the online suite of games available from BrainPOP, the mobile apps created by PBS KIDS, and the 3D multi-user simulation, *Atlantis Remixed*. Alternately, only 45% of GUTs agreed with the statement, “Commercial games not created for educational purposes can be used to teach core curriculum” (Pressey, 2013, p. 29). This is of interest because commercial games have been shown to possess qualities consistent with constructivist-inspired views of learning (e.g., student-centered / self-directed learning) (Din, Haron, & Rashid, 2016; Hannafin, Hill, Land, & Lee, 2014). The premise of student-centered instruction is the shifting away of teachers as purveyors of information and more towards the role of facilitators—providers of guidance and scaffolding for student learning. In the same vein, students are seen as autonomous participants who are actively engaged in and responsible for their own learning and, upon gaining a greater sense of control over their academic endeavors, can readily engage in meaningful learning activities and achieve favorable learning outcomes.

Consequently, many of the positive qualities that constitute good video games are among the qualities sought by educators and education reformists. For example, according to the SecEd Guide to...Outstanding Teaching (2012), key criteria for outstanding instruction include "high levels of engagement", "collaboration", "tasks [that] are challenging", and "activities [that] are imaginative" (Hill, 2012, p. 4). Video games exhibit parallels to student-centered learning, catering to students by eliciting responses that engage and enhance their learning experiences.

Clark Abt further suggests in his book *Serious Gaming* that video games in education combine the serious cognitive work of learning with the emotional freedom of active play to produce a more impactful learning experience (Abt, 1987, p. 11). He claims it is this holding

power—a trait video games have to entertain and generate emotional involvement—which lends to its value in the educational arena. Abt does, however, acknowledge concerns that video games may not be able to fully impart, what he calls, True Knowledge (p. 12). He turns to the work of Jean Piaget (1967), who cites "Knowledge is not a copy of reality. To know an object, to know an event, is not simply to look at it and make a mental copy, or image, of it. To know an object is to act on it. To know is to modify, to transform the object, and to understand the process of this transformation, and as a consequence to understand the way the object is constructed." Abt suggests that games should not replace or render traditional instruction redundant; rather, games should be considered no less capable of imparting knowledge or promoting learning (p. 12). Video game designers and developers have honed the motivational angle to near-perfection; it is the harnessing of this driving force in the classroom that some say holds potential for modern learning environments.

The direction of this literature review now shifts to uncover research about the benefits of video games, as well as examples of video games being used in educational settings. The following section details relevant findings.

### **Video Games and Learning**

In conducting this section of the literature review, I strove to find examples of studies that examined video game use in elementary schools (grades K-8), as that is the particular demographic of teachers I intend to interview. However, this endeavor was only semi-fruitful. As a result, I included studies at the high-school level as well. As noted previously, uncovering teacher experiences and perceptions proved difficult. As a result, I focused the research on examples of video games being used in classroom settings, which primarily focus on areas of student performance and improvement in a variety of areas. From these studies, I was

successful at gleaning a limited number of teacher experiences regarding the implementation of digital game-based learning.

According to a meta-analysis conducted by Qian & Clark (2016), their findings suggest an overall upward trend in digital game-based learning research. Looking at 137 academic papers, the literature was diverse with respect to its findings, which included information about participant ages, game genres, and learning outcomes. As it pertains to participant ages, 30% of the studies investigated those in higher education, followed by 21% in middle school, 20% at the elementary school age and 13% of high school age, and a mere 9% being adults. A notable observation, given my own study, is that much of the research surrounding video games is occurring in higher-education settings, as opposed to the elementary level, which one could argue is a time in one's educational development where learner attitudes towards the school infrastructure and learning in general are ultimately shaped for better or for worse. Among the classifications of game genres within the meta-analysis, 50% of studies employed an educational game (e.g. serious games, simulations, educational, edutainment), and the rest used entertainment games (25%), while 15% were mobile augmented reality, mobile games, or design-based games/tools. The remainder (7%) employed intelligent tutoring systems, gamification or other digital technologies (4%). Among their findings, the most frequently occurring outcomes were *student* behaviors and attitudes (42%) as well as cognitive gains (38%). The study did not provide a concrete list of what these behaviors or attitudes are. However, the authors acknowledged that 42% of the studies cited behavior(s) as learning objectives, which may suggest elements linked to motivation, critical thinking, creativity, collaboration and communication skills. Unfortunately, among this meta-analysis, no

information could be gathered as it pertains to teacher behaviors and attitudes, particularly among the K-6 demographic, on which this study is specifically focusing.

Identifying other positive implications of video games in learning environments—the research reveals favorable results. It should be noted, however, that most of these studies were conducted by researchers—*not teachers*—and, therefore, can only provide an approximate understanding of how video games can actually function within the learning space. With that said, the following studies illuminate findings of significance uncovered from studies whereby a video game-based model of instruction was implemented.

Studies have been conducted regarding the use of video games and their effects on autonomy (Domínguez, Saenz-de-Navarrete, De-Marcos, Fernández-Sanz, Pagés & Martínez-Herráiz, 2013; Furtak & Kunter, 2012), engagement (Laffan, Greaney, Barton & Kaye, 2016; Sosa, Simon, Sweetman & Rupp, 2016), and motivation (Birk, Atkins, Bowey & Mandryk, 2016; Folkins, Brackenbury, Krause, & Haviland, 2016) among learners—elements that are aligned with student-centered instruction. Rosas et al (2004), for example, led a study of video games in classroom settings by calling upon a focus group consisting of first and second-grade students. Five games were employed, chosen to address the educational goals of the selected student population for basic knowledge in mathematics and reading comprehension with emphasis on improving both language and communications skills (pp. 78-79). Not only did the results yield an increase in the ability scores of the experimental (video-game) group (p. 84), but the study also revealed that, upon reinstating conventional teaching methods following the game-based activities, there was a decline in student performance, as students had become accustomed to the autonomous / self-guiding approach of the video-game activity (p. 86). Perhaps the greatest effects that the introduction of video games produced in the

instructional setting were the varying degrees of motivation on the participant pool; chiefly, there was an increase in the drive and enthusiasm of students who were exposed to gaming (Rosas, et al., 2004, p. 87). Likewise, *teacher inclinations* towards educational video games also improved, as observations saw an increase in peer collaboration and responsibility (p. 88). A conclusion drawn from the study was that certain video games, used as instructional tools, can have positive effects on learning and motivation in the classroom and have been shown to stabilize and increase cognitive development (Rosas et al., 2004, p. 72). In this particular study, the use of video games was not only effective in eliciting motivation and learning, but implementation also resulted in a positive attitude towards video games by students and teachers alike.

Regarding other endeavors of integrating commercial video games to increase student performance, findings have also been favorable (Sun & Gao, 2015). The characteristics of video games allow players to develop skills that can relate to real life scenarios and create knowledge bases that can be applied to academic endeavors (Briggle, Holbrook, Opong, Hoffmann, Larsen, & Pluscht, 2016). Since video games allow for the repeated execution of a task, they allow students to enhance cognitive elaboration, which is the process of forming associations between new information and prior knowledge (Becker, 2017; Reigeluth, 1999).

Other impacts video games have on the cerebral capabilities of learners include improvements in cognition and perceptual skills. Novak and Tassel (2015) conducted a study focusing on geometry, word, and non-word math problem solving skills among students who were experienced playing action video games (AVG) compared with those who were less experienced. The study determined that students who were more experienced playing action-themed video games displayed improved cognitive skill, spatial awareness, and working memory—traits that are important in promoting mathematical proficiency (Novak & Tassell,



2015). Due to the high-speed nature of the in-game events—often requiring quick reflexes to overcome challenges—AVG players were found to display gains in selective attention, described as “the processes that allow an individual to select and focus on particular input for further processing while simultaneously suppressing irrelevant or distracting information” (Novak & Tassell, 2015; Stevens & Bavelier, 2012, p. 30). Another notable outcome of using action games in the classroom was decreased amounts of stress among students (Novak & Tassell, 2015).

Video games have been shown to provide improvements in learning and retention—specifically, the fields of reading comprehension, grammar, and mathematics (Bavelier & Green, 2016). For example, Sun and Gao's (2015) study examined the use of video games among groups of students between the ages of fifteen to sixteen years of age with specific focus on commercial games' abilities to improve scholastic performance. *Cut the Rope* and *Angry Bird Space* were two games used as a means to measure learned physical concepts and, upon completion of the video-game sessions, students were assessed via multiple choice questions in conjunction with concept maps to evaluate and measure the games' effectiveness on student learning. The results of the study revealed an increase in scores among the experimental group over students who were taught similar concepts through a more traditional teaching approach (pp. 176-178). Additionally, this study, yet again, revealed that video game use resulted in increased motivation. Furthermore, findings also revealed an increase in students' ability to use collaboration as a tool to accomplish goals. Such findings demonstrate that video games have the potential to improve student understanding of physical concepts and, when harnessed with specific learning goals in mind, can be an asset in a learning space.

Video games have also proven to be useful in teaching foreign languages. Massively Multiplayer Online Role-Playing Games (MMORPG's) and other online games, have been explored as a means to teach foreign language (Alias, Rosman, Rahman, & Dewitt, 2015, p. 1022). Norlidah Alias (2015) conducted a series of interviews with a pool of professionals in the field of education, as it pertains to the Malay language, which has changed its context from an official language, national language and language of knowledge to a language *learned as a foreign language* (Alias, Rosman, Rahman, & Dewitt, 2015). This study sought input from curriculum specialists, ICT specialists and language teachers in order to help identify elements required in video games for teaching the Malay language to students. Based on the analysis from this sample group, the consensus revealed perceived improvement in the retention of skills acquired from video games and pointed to high suitability for gaming use in the learning space (Alias, et al., 2015, p. 1025). Another conclusion made from this study: the appealing nature and interactivity of video games can make language studies more attractive proceeding into the future (Alias, et al., p. 1026). One particular criticism of this study is that the researchers do not isolate the teacher responses. Rather, the findings are a collection from an assortment of parties. Additionally, no first-hand accounts were recorded or reported in this study, as it was quantitative in nature.

Transitioning this section, the following paragraph concerns other notable findings—namely studies that reported negative / unfavorable implications of video game use in learning environments. For example, Desai, Krishnan-Sarin, Cavallo, & Potenza (2010) conducted a cross-sectional anonymous survey of 4,028 students in public high schools. According to that survey, these adolescents reported problems with gaming and other health behaviors. A total of 51.2% of the sample acknowledged playing video games (76.3% of boys and 29.2% of girls)

and, among this demographic of gamers, 4.9% reported problematic gaming habits, which included reports of trying to cut back on time spent gaming, experiencing an irresistible urge to play, and experiencing a growing tension that could only be relieved by playing video games. The study identified that boys were more likely to report these problems (5.9%) than girls (3.0%), which suggests that male gamers may be at higher risk for developing a gaming problem (Desai, Krishnan-Sarin, Cavallo, & Potenza, p. 1418). One may interpret from these findings that video games in classroom settings tread a fine line, as the notion of video game use in the classroom "lies at the boundary zone between the resilient structures of education and entertainment that structure contemporary childhoods in the United States" (Ito, 2008, p. 89). This can be a difficult hurdle that educators and proponents for academic reform face. These facets are among several possible considerations in understanding the lifeworld of teachers as they relate to video game use in their respective education settings.

In conclusion, it should be once again noted that in conducting this review, little information could be gleaned on teacher experiences pertaining to the rise of video game use in schools. In addition, minimal information regarding teacher attitudes could be uncovered. At this juncture, the literature review shifts to examine the integration of other forms of technologies in school settings in hopes that such findings may add substance to the topic in question.

### **Teachers and Other Forms of Technology**

Schools and their respective teacher populations have been incorporating new technologies into their instruction for decades. In order to try and understand the basic components that embody teacher mindsets, an attempt will be made to illuminate perspectives through an explication of relevant literature as seen through teacher reactions to technology more

broadly; still, this study strives for teacher reactions towards video games. The broader exploration of teacher attitudes and experiences with technological integration is an effort toward extrapolation that may be applied to this study and to perceptions of gaming as a framework for fuller understandings. The literature review now turns to examples of tools that have been successfully integrated in classroom settings, including cell-phones, digital cameras and mobile devices, as well as social networks and digital media.

### **Mobile Learning: Handheld Computers & Mobile Phones**

Among popular devices that were once considered a taboo in the classroom, yet became more readily accepted in schools, those of the mobile/handheld variety are perhaps the most notable. Mobile learning (M-Learning) refers to the utilization of mobile devices, such as smart-phones, handheld computers, notebooks, and tablets for educational purposes. M-learning is convenient in that it is accessible from virtually anywhere, with almost immediate delivery of shared content among an active participant pool. As far as devices that are readily available and meet the desired technical specs to achieve M-Learning, smart-phones are among the most prominent due to the fact that the ownership of such devices has become more commonplace among students in recent years. For example, recent reports indicate that 87% of active high school teenagers own a cell phone (Lenhart, 2012; Madden, Lenhart, Duggan, Cortesi, & Gasser, 2013).

A smartphone is a sophisticated mobile phone that functions as a handheld computer capable of running software applications (colloquially called “apps”), which can offer an assortment of tools and functionalities. The use of mobile technology offers synchronous instruction via texting and email, digital cameras, and internet access—all of which can complement a teacher’s desired learning objectives (Roblyer & Doering, 2010). In addition,

smart phones in the classroom have been proven beneficial in other ways, including content creation (Gikas & Grant, 2013), student-centered learning, authentic learning (Ke & Hsu, 2015), assessment and reflection (McClanahan, Williams, Kennedy, & Tate, 2012), and differentiation of instruction (Rossing, Miller, Cecil, & Stamper, 2012). Cell phones also enable students to multitask by conducting research, access course materials and communicate with other students and their teachers.

Smart phones also generally double as portable digital cameras. According to Lenhart (2010), 83% of teenage students reported taking pictures with their cell phones. Applications of the digital camera for instruction include (a) collection of data, scientific visualization, and communication in science; (b) facilitation of reading, writing, and visual communication in language arts; (c) mathematical analyses, transformations, and providing a context for problem solving in mathematics; and (d) as a tool for inquiry in social studies (Bull & Thompson, 2004).

Another specific function of the digital camera is that of augmented reality (AR), which utilizes the built-in camera to allow learners to interact with virtual objects or digital scenes that are linked to a physical setting (Dunleavy & Dede, 2014). Although AR technology is not exclusive to cellular devices (Klopfer, 2008), it is a popular choice due to accessibility among the user base.

Concerning teacher experiences and opinions as they pertain to mobile devices, Thomas, O'Bannon and Bolton (2013) surveyed one hundred and one teachers about the benefits, barriers, and use of cell phones in education. The results confirmed that teachers used the camera and other features of the cell phone in the classroom. When asked about using the mobile devices in their classroom, 59% reported that cell phone use increased student engagement in the classroom and 24% acknowledged students more motivated by the intervention. 5% of teachers said that

the cell phones provided access to learning opportunities anywhere and anytime (Thomas, O'Bannon & Bolton, 2013).

Teachers were also asked to identify barriers of using cell phones in their classrooms. Among the findings, 61.5% of surveyed teachers acknowledged the *cost* of cell phones, with 51% noting the technology could cause *disruptions* in their classrooms, and 47.4% fearing students could access *inappropriate content* on the cell phones. Additionally, 37.2% of teachers feared cell-phones could *help students cheat*, while 33.3% were concerned the phones could be used for *cyberbullying*, and 24.4% believed students would use the devices to send inappropriate messages to one another (Thomas, O'Bannon & Bolton, 2013). Another study by Matchan (2015), acknowledged that teachers considered cell phones to be more of a distraction than an effective teaching tool.

One interpretation of these findings seems to suggest that teachers may be more concerned about the negative implications of the devices and their impacts on the teachers maintaining control of the classroom dynamic. The examples noted above suggest that classroom management may be a chief concern to teachers.

### **Social Networks and Digital Media**

Another popular form of technology that has worked its way into the modern classroom is that of social media. Like cell-phones and video games, social media have not always been a popular choice in schools (Cain, 2008), but have steadily gained a footing in today's classroom settings. In addition, it should be acknowledged that the culture of video games exists outside of the game-world, bleeding into the realm of pop culture and online social media. There exists a wide assortment of video game genres—many of which are social in nature—often offering cooperative or competitive play via local or online networks. MMORPG's, for example, are

massive multi-player role playing games whereby players interact with one another, collaborating in group ventures of the constructive or destructive variety. Consoles, such as X-box and PlayStation offer online memberships, such as X-box Live or PSN Network that allows game players to find friends, chat with fellow gamers, record their gaming activities and share them online. The culture of video games has effectively trickled outside of the game worlds and onto social media—taking the form of online forums, Facebook groups, YouTube channels, live-streaming channels, such as Twitch, etc. Commonly these tools are used to discuss strategy, plan future in-game activities, stream events, foster exchanges with one another in threads, comment sections, etc. Likewise, many video game players blog/vlog/live-stream about their experiences in video games, which serves as another social media outlet to fan the flames of their fandom.

The utilization of social networking software has produced a new medium for social interaction, catering to the personal and professional dynamics in one's life with the capability of being entertaining, as well as educational. Initially, teachers started using social media to communicate with other teachers, as well as collaborating and sharing ideas, but the practice has also transitioned into harnessing social media to communicate directly with students, as well.

Research on the effects of social media implementation in education settings have yielded mixed results. For example, studies by Kirschner and Karpinski (2010) and Paul, Baker, and Cochran (2012) identified negative correlations between students' time on Facebook and their classroom performance. However, other researchers have found contradictory results, revealing that the implementation of social media can increase student relationships (Junco 2012; Junco, Heiberger, and Loken 2011), which leads to greater performance in school (Kuh 2009; Lane and Lewis 2013). Moreover, Johnson (2011) determined that social media can enhance the relationship between student and teacher, producing affective learning, which is the manner in

which one engages with something emotionally, i.e. feelings, values, appreciation, enthusiasms, motivations, and attitudes (Krathwohl, Bloom, Masia, 1973; Picard, et al, 2004).

Findings by Matzat and Vrieling (2015), revealed that teachers apply social media for information sharing with students both inside and outside of the classroom. Surveying 459 teachers, the study revealed that 49.8% of sampled teachers reported the use of social media within their classroom as a supplement to their traditional teaching and 34.0% used them for sharing information with their pupils outside of the classroom.

When asked questions about the intensity of the use of social media tools, including Twitter, Facebook, LinkedIn, YouTube, WhatsApp, or something else, 43% claimed to employ only one tool: YouTube. In other words, of all teachers, about 50% did not use social media for in-class teaching, 21% exclusively employed YouTube, and 29% claimed to use another form of social media, such as Facebook, Twitter, WhatsApp, etc. The extent of YouTube use was not associated with the use of other social media.

As it pertains to teacher attitudes regarding social media use in their classrooms, the study revealed that many, though not all, of the sampled teachers reported holding a positive opinion about the use of social media for teaching. When asked whether they agreed with the statement ‘social media are NOT good for the learning process, 49% rejected the statement and 39% were indifferent. A minority of the sampled group (12%) agreed that social media were not a good fit for learning. Ultimately, findings were favorable with at least half of the teacher population inclined to use social media for their professional needs.

YouTube is a unique media platform, as it is a hub of user-generated content that doubles as a social platform, offering the ability for an individual to create a profile and communicate with others, either in the form of comments or response videos. As to how the surveyed



population of teachers employ the platform, it appears that its use is more akin to a traditional media cart, fashioned with a TV and VCR, whereby videos are played to the students in a passive viewership model of instruction. It was not specified if teachers were employing student-centered approaches using YouTube, i.e. allowing students to create and share their own content. In regards to teacher opinion, however, the findings suggest that teachers have a favorable attitude toward the technology.

The literature review now shifts to examine the lifeworld of educators. Touching upon elements related to the inner workings of the academic institution may yield insights into the experiences of teachers with digital educational games and the shaping of teacher attitudes surrounding the technology as a teaching tool. Likewise, in exploring this topic, it is acknowledged that school administrators also play a role in this phenomenological inquiry.

### **The Lifeworld of Educators**

In the field of education, teachers face new and surprising challenges on a daily basis (Haedicke & Hallett 2015). Teaching is an extremely diversified occupation requiring well-rounded, quick-thinking individuals (Bakhru, Sanghi & Medury, 2013). During a single day, educators will implement lesson plans (Ravitch, 2016), manage behavior problems (Emmer, Sabornie, Evertson, & Weinstein, 2013), motivate students (Brophy, 2013), grade papers (Looi, et al, 2014), plan for future lessons (Darling-Hammond, 2015). and parley with parents, faculty, and administrators (Whitaker & Fiore, 2015). With this in mind, it is relevant to briefly address possible factors that are part of the lifeworlds of educators in order to gain a better understanding of how the implementation of video games may have shaped their lived experiences. In doing so, the interview questions may be better articulated.

### *The Psychosocial Perspective*

According to Zhao & Frank (2003), "teachers' attitudes toward and expertise with, technology often are key factors associated with their uses of technology" and "unless a teacher holds a positive attitude toward technology, it is not likely that he or she will use it in teaching" (p. 809). This purpose of this phenomenological inquiry is to examine teacher experiences as they pertain to the application of educational digital games in their classrooms.

For teachers, there can exist underlying conventions of teacher socialization; i.e., the formative teaching perspectives and practices that are the result of influences from any individual, group, or institution. Zeichner and Gore (1990) define teacher socialization as "the process whereby the individual becomes a participating member of the society of teachers " (p. 329). Goodman (1988), whose work entails teacher socialization, states that "teaching perspectives take into account how situations within classrooms are experienced; how these situations are interpreted given the teacher's previous experiences, beliefs, and assumptions; and how these interpretations are manifested in behavior" (1988, p. 121).

Teachers influence their students not only by how and what they teach but also by how they relate, teach and model social and emotional constructs, and manage the classroom. (Jennings & Greenberg, 2009). It is likely, then, that the teacher beliefs about video games are a factor in this phenomenological inquiry. As noted by Hobbs (2007), "it is a teacher's personal beliefs that influence his/her classroom decisions" (p. 415). One of the goals of this study is to better understand the beliefs of the modern teacher as they pertain to video game use in the classroom.

### *Acknowledging Themes of Violence*

Fear of violence is a pervasive topic in many social circles. Whether the concerns of violence or aggression related to video game use contributes to a teacher's experience with its implementation in the classroom has yet to be determined. However, it is certainly an item of interest as the research enters the phase of data collection and analysis.

Like smart-phones and social media, video games have been a target of ridicule (Boxer, Groves & Docherty, 2015; Gunter, 2016). The mainstream media has contributed to division on this topic, as there are frequent reports that depict video games in a negative light (Gao, Chen, Pasco & Pope, 2015; Glynn, 2016; Greenfield, 2014; Greitemeyer, 2014). Since the 1980's, video games, as well as television and movies, have been blamed for eliciting violent tendencies among our youth. Broadcasters, politicians, psychologists and medical practitioners alike have been known to take an accusatory stance on the topic. As gaming technology continues to grow in processing power and sophistication, representations of violence have become more realistic. This has led to concerns that individuals who play such video games will become influenced and conditioned by the activities in which they engage in-game and begin to exhibit antisocial and violent behaviors in real-life (Calvert, 2015; Rogers, 2016).

Scholarly studies have attempted to determine a connection between violent video games and the rate of violence and crimes from those who play them. Some have stated a connection exists (Anderson, Bushman, Donnerstein,, Hummer, & Warburton, 2015; Gunter, 2016; Groves & Anderson, 2017), while others find minimal to no link whatsoever (Adachi, 2015; Andrews, 2016; Ferguson, 2010; Ferguson, 2015; Ferguson & Olson, 2014; Ivory, & Ivory, 2015). Some have found a positive effect to gaming as it relates to delinquent youth, such as a study that looked specifically at kids who had been in trouble in the past with the law and correlated it to gaming—finding that gamers were *less* likely to repeat an offense,

suggesting that gaming might be a way to learn to control anger rather than being the trigger (Ferguson & Olson, 2014).

In another study, Buelow, Okdie, & Cooper (2015) examined the effects of active video game play on decision making, problem solving, and risk-taking. Although this study does not focus on themes of violent behavior or recidivism, it tackles the choices one may make with or without the influence of games. In the study, two hundred twenty-eight undergraduate students (114 male / 114 female) played one of five different video games (n = 91) or were part of a separate, no-game control condition (n = 137). Those in the video game group were randomly assigned to play one of five video games (Call of Duty: Modern Warfare 3, Dead Island, LittleBigPlanet, NBA2K12, and Need for Speed: Hot Pursuit), games that vary widely in their level of violence, type of content, and style of gameplay, and were chosen to ensure that effects were not due to a single aspect of one particular video game. Findings revealed that participants in the video game group made significantly more advantageous choices when compared to participants in the control group when both groups participated in The Iowa Gambling Task (IGT), which was created to assess decision-making impairments among individuals who engaged in real-world risky decision making. A conclusion made from the study was this: "The results...are more consistent with the hypothesis that active video game play can improve cognition, rather than the hypothesis that active video game play results in impairments in cognition" (p. 232). Furthermore, they conjecture that "the effects of video game play on cognition are more complex than a simple dichotomous good/bad distinction...it could be the amount of game play and the expertise (i.e., gamer versus non-gamer) of the player...may influence this relationship" (p. 232). Given such conclusions, the case against video gaming is at best muddled.

### **The Organizational Perspective: How School Policies Could Be a Factor**

Organizations are defined as social units of people that are structured and managed to meet a need, or to pursue collective goals (McClean, 2015). For schools, the primary goal of the organization is educational in nature—ensuring student learning and retention by striving to meet state standards, as outlined by the United States Department of Education (USDE). However, meeting educational standards is an overarching goal and, as an organization, there can also exist collective goals—these can include qualifiers, such as civic development (Bringle, Reeb, Brown & Ruiz, 2016; Flanagan, et al, 2015; Pace, 2016), emotional development (Elbertson, Brackett & Weissberg, 2010; Kochenderfer-Ladd & Ladd, 2016; Rimm-Kaufman & Hulleman, 2015), cognitive development (Muhonen, et al, 2016; Wigfield, Gladstone & Turci, 2016), vocational development (Boersma et al, 2016; Hamilton, Symonds & Kotamraju, 2013), as well as social development (Beck, Crittenden, & Sullivan, 2016; Social and Character Development Research Consortium, 2010). In order to reach these goals, the members of the organization have an obligation to adhere to policies and protocols implemented by the institution (Schleicher, 2016).

Policies act as a guideline, not only presenting the expectations for employee productivity, but also setting the standard for expectations related to missions and goals. Routinely, such protocols align with an organization's desired workplace culture and serve to foster an environment of mutual respect and ethical behavior. In school settings, policies are also created to foster and maintain a well-behaved, respectful student culture.

Educators and administrators alike share a common goal for students to demonstrate orderly conduct on the school premises. Teachers are trained to design and employ behavior modification protocols (Bandura, 1969; Briesch & Chafouleas, 2009; Chaplain, 2016; Glickman & Wolfgang, 1986; Greenberg, Putman & Walsh, 2014; McDonald, 1973), which become the guiding laws of the classroom, as well as serving as deterrents for student misbehaviors. In this

regard and referring back to themes of violence and aggression, this could also influence school policymaker decisions as they pertain to video games as a teaching tool.

Technology integration is another policy-driven aspect of the teacher lifeworld—one that can lend itself to its own unique sets of opportunities and challenges. Video game integration adds to the multi-faceted layer of technology-based policy implementation. It should also be noted that additional forms of guidelines may also be developed at the state, local, and school levels.

The International Society for Technology in Education (ISTE) is an organization that contributes to educational policy-making as they pertain to technology integration. This group advocates the adoption of technology strategies that can enrich teaching and learning in K-12 schools and transform classrooms into student-centered learning environments. Additionally, ISTE acknowledges that administrators and teachers, alike, are significant to the successful design and implementation of effective instructional environments. The organization has classified 14 critical components required to successfully leverage technology for learning, which include consistent and adequate funding, equitable access, skilled personnel, ongoing professional development, student-centered learning, and policies and initiatives that support teacher and school preparation programs in the effective implementation of technology. ISTE has developed standards for administrators (ISTE, 2009) and teachers (ISTE, 2008), which are to be considered as they design, implement, and assess learning experiences to engage students and improve learning and enrich their professional practices. Additionally, support policies have been introduced to keep students safe online and guide the appropriate use of technology. Essentially a structured framework for effective operation and application, the support policies address all aspects of technology use across all stakeholder groups, from high-

level policies governing web filtering and access to low-level policies around digital citizenship and acceptable use agreements.

One such policy that could also play into school-based video game integration is the Acceptable-Use Policy (AUP), which outlines, in writing, how a school or district expects its community members to behave with technology. It communicates guidelines that are agreed upon by students, parents, educators, and faculty, as it pertains to acceptable and unacceptable behaviors as it relates to technology use—implemented as a means to prohibit certain actions (e.g. plagiarism, online pirating, etc.), but also defining positive goals for incorporating technology into the school day. This particular label of policies is designed to support student learning, protect the school community, and comply with existing laws. AUP provides clear direction on how to navigate the use of digital technologies with competence and a sense of security.

Another policy that may also factor into teacher experiences with video game integration is that of Zero Tolerance, which was enacted to create safe schools by preventing drug abuse and violence. The Zero Tolerance Policy is a strict enforcement of regulations and bans against undesirable behaviors or possession of various items. Typically, punitive measures are employed against violators in the form of exclusionary disciplinary practices, such as suspensions and expulsions (Flynn, Lissy, Alicea, Tazartes & McKay, 2016). Often, these measures are at the discretion of the teacher and, due to the subjective nature, reports of misuse and abuse of zero tolerance have been reported. Action-themed video games and first-person-shooters are well known to digitize violence, in some cases extreme violence, and that can conflict with a school's Zero Tolerance Policy and other anti-violence practices used in the

classroom. This may be a concern of some teachers and/or administrators when considering using such games in the classroom.

As data collection was conducted, teachers were asked about these policies and more, in the hopes they might provide greater understanding of the phenomena in which this study is situated. There are likely other local policies and regulations at the school level that factor into teacher experiences with video game use at the instructional level as well. Considering the variety of school policies and significance of their day-to-day applications, school policies could weigh heavily on teacher experiences with video games. Without asking, we cannot know the degree to which these practices have shaped teacher experiences and attitudes toward video game implementation in their respective learning environments.

To summarize this literature review, video games are a unique instructional tool due to the interactive (Woods & Rosenberg, 2015) and learner-centered (Din, Haron, & Rashid, 2016; Hannafin, Hill, Land, & Lee, 2014) nature of the delivery platform. They vary in genres (Egenfeldt-Nielsen, Smith, & Tosca, 2016) and applications (Bull & Thompson, 2004), and the research, as it pertains to cognition (Novak & Tassell, 2015), retention (Bavelier & Green, 2016; Sáez-López, Román-González & Vázquez-Cano, 2016), motivation (Rosas, et al., 2004), and other skill areas (Laffan, Greaney, Barton & Kaye, 2016; Sosa, Simon, Sweetman & Rupp, 2016) yields encouraging results, but video games are still an item of contention (Deterding 2014; Kutner & Olson, 2011; Van Cleave, 2010) in some scholarly circles. There is insufficient qualitative data as it pertains to first-hand accounts of teachers' or administrators' experiences using video games in the classroom but the information that could be gathered suggests that some teachers find merit in their use (Alias, et al., 2015; Pressey, 2013; Rosas et al., 2004). In regards to other forms of technology, such as smart-phones, mobile devices, and social media,



these were at one time considered questionable teaching tools, yet educators also found worth in their instructional applications (Matzat and Vrieling, 2015; Thomas, O'Bannon and Bolton; 2013). Despite reports of video games being used in schools, the experiences of the teachers remain, by and large, undocumented. Taking all of this into consideration allowed for development of the interview questions that would be asked.

The chapter that follows outlines the methods used in pursuing greater understanding of the lived experiences of those teachers that have employed and continue to employ educational digital games in their classrooms.

### Chapter 3 - Research Design

#### Introduction:

This chapter describes the research design that addresses the proposed research question:

#### **What are the experiences of teachers who use educational video games in their classrooms?**

The focus of this study was to examine the lived experiences of K-8 teachers as they pertain to the utilization of digital educational games in their respective classrooms. The goal of this study was descriptive, not generalizable. However, it should be noted that phenomenology becomes hermeneutical when its method becomes interpretive (Heidegger, 1967, van Manen, 1997). A central posture of hermeneutic phenomenology is that our most fundamental and basic experience of the world is already full of meaning (Merleau-Ponty, 1962/ 2006; van Manen, 2007). The world of our lived experience, the lifeworld, is the very ground from which all understanding grows; what we know is always negotiated within the culturally informed relationships and experiences, the talk and text, of our everyday lives (Angen, 2000). My intent, therefore, was to collect the experiences of practicing teachers and, upon careful analysis, to dispense the interpretations of said meaning to the greater academic community.

#### Methodological Orientation

The literature review provided sufficient evidence to support the notion that teachers are adopting new technologies in their classrooms, but the review did not uncover sufficient examples of teachers' first-hand accounts of integrating video games into their classrooms. The aim of this study is to examine teachers' experiences using video games in the classroom setting. As noted in chapter one, this is a fairly recent shift of video game integration that is occurring in their classrooms and schools. I want to examine the lived experiences of these K-8

teachers—specifically, what it's like to be a game-using teacher and how the integration of video games in their classrooms has influenced their teaching practices.

In order to address the research question, I selected phenomenology, which is based largely on the work of philosophers Edmund Husserl (1859- 1938) and Martin Heidegger (1889- 1976). Phenomenology is a method of philosophical inquiry grounded in the assertion that reality consists of objects and events, otherwise known as phenomena, as they are perceived or understood in the human consciousness and not of anything independent of that consciousness. Researchers (Laverty, 2003; Moustakas, 1994; van Manen, 1997) have dispensed descriptions of phenomenology as a methodology, method, and technique through which to understand the lived experience. van Manen (1997) differentiates the phenomenological methodology, method and technique in the following ways: he states that the methodology provides a philosophical framework through which to understand the study, whereas the method involves the orientation to the methodology, and the technique is the means by which a researcher accomplishes the method (1997). In this study, I use a phenomenological methodology that is grounded in hermeneutic (Gadamer, 1960/2004; Heidegger, 1927) phenomenology, which is interpretive, as opposed to purely descriptive (i.e., transcendental phenomenology.) In fact, Heidegger (1927) notes that all description is always undergoing some form of interpretation.

The reason hermeneutic phenomenology is suited for this study is that the method gives attention to how things appear by letting things speak for themselves; it is interpretive because it claims that there are no such things as “uninterpreted phenomena” (van Manen, 1997, p. 180). Hermeneutic phenomenological methods emphasize interpretation based on cultural, social, and historical contexts, whereby every experience must be described and understood in

relation to the prior and current contexts within which it resides (Laverty, 2003). It brings to light the small details, the seemingly trivial, and everyday aspects that might be taken for granted in our lives, with a goal of creating meaning and achieving a sense of understanding (Wilson & Hutchinson, 1991). When undertaking a study using hermeneutic phenomenology, the unit of analysis falls not on the individual but on the interaction between the individual and the contextual or situational essence of the experience. This study explores the experiences of elementary teachers, chiefly the interaction with video game use in the classroom—ranging from their accounts of a time before video game-use to the eventual implementation phase and, finally, present-day experiences. A hermeneutic phenomenological approach is well-suited, as the research question asks for meanings of a phenomenon with the purpose of understanding the human experience (Heidegger, 1962).

This study sought the accounts from teachers about moments employing video games in their classroom instruction. This method allows a researcher to collect lived experience stories, as well as answers to conceptual questions, in order, in my case, to uncover how teachers think, feel, or have been changed by the experience of integrating video games in their classrooms. Hermeneutic phenomenology is ideally situated to explicitly and in great detail reveal what the teachers really think about video games through their interactions with the technology and interpretations of intrinsic value based on their evaluation of said experiences. Conducting interviews with those who have participated in the integration of video games in their classrooms allowed me to attain deeper understanding of how the experience has shaped the identities of the teachers, their relationships, and the activities in which they participate (Jacobs, 2010).

### **Participants and Sampling**

In order to achieve the objectives set forth in this study, in-depth, semi-structured interviews with K-8 teachers were conducted. Fifteen teachers from South Jersey and Pennsylvania participated in the interviews. Criterion-based snowball sampling was employed to identify participants. This selection of participants is based on recommendations from others based on the qualities their referrals possess. Simply put, the researcher decides what needs to be known and sets out to find people who can and are willing to provide the information by virtue of knowledge or experience (Bernard 2006, Lewis & Sheppard 2006) (as cited by Tongco, 2007, p. 147).

A desired commonality among this participant pool selection included the following: 1.) they were active, employed public school teachers (teaching K-8), 2.) they had five plus years of experience teaching, and 3.) they have been employing educational video games in their instruction for a minimum of five plus years. Ideally, I was looking for a total of 12-16 participants. This pool was open to all willing participants, including young and old, men and women, and representatives from both public and private institutions. This study was inclusive in an effort to develop a more complete representation of the lifeworld under investigation.

As it pertains to the criterion-based snowball sampling, I recruited individuals by word of mouth and peer referrals. From there, I was able to identify those who satisfy such criteria and was then directed to other qualifying candidates.

### **Procedures**

The following sections describe the selection of data sources for this research, how data collection was accomplished, and information about how the data was analyzed.

Gee notes that interviews can be sufficient to acquire the data necessary to do complete qualitative data analysis (Gee, 1995; Gee, 1997; Gee, 2004; Gee, 2007.) Like Gee, I believed interviews were where I could get the richest and most useful examples of data pertaining to the research topic. However, to achieve a richer, more comprehensive collection of teacher experiences, data triangulation was employed.

To create more robustness beyond interviews, my data triangulation included *observations, field notes, and member checking*. This was done to ensure the data reflects the most comprehensive portrayal of teacher experiences as they pertain to video game integration in their classroom.

This study aimed to use confirmability (Jensen, 2008; Lincoln & Guba, 1985) and measures of trustworthiness (Guba, 1981; Shenton, 2004). Concerning evaluative criteria of trustworthiness, I refer to Lincoln and Guba's (1985) measures of *credibility* (confidence in the 'truth' of the findings), *transferability* (showing that the findings have applicability in other contexts), and *confirmability* (a degree of neutrality or the extent to which the findings of a study are shaped by the respondents and not researcher bias, motivation, or interest). I established such measures of trustworthiness by employing thick descriptions, highlighting research bias, and conducting member checking. I will elaborate on each of these techniques later in the chapter.

### **Interviews: How Interview Data is Used in Qualitative Research**

Seidman (2013) ruminates about interviewing as qualitative research—he states, “at the heart of interviewing research is an interest in other individuals' stories because they are of worth” (Seidman, 2013, p. 9). He also acknowledges that, although so much research is done on schooling in the United States, so little of it is based on studies involving the perspective of a variety of school-related officials—including teachers, whose individual and collective

experience constitutes schooling (Seidman, 2013). "Interviewing gives us access to the observations of others. [It] can inform us about the nature of social life" says Weiss (1995, p. 11). By conducting interviews about people's interior experiences, we can learn what people perceived and how they interpreted their perceptions. Moreover, we can learn how events affected their thoughts and feelings. We can learn about the meanings to them, as they relate to their relationships, their families, and their personal and professional identities. We can learn about all the experiences, from elation to frustration, that culminate and constitute the human condition (Weiss, 1995).

In the phenomenological analytic approach, the researcher abandons the assumption that there is only one truly accurate version of participant's' action and belief. Interview talk is, by nature, interpretation work concerning the topic in question. It is reflexive, theoretical, contextual and textual because the objects of talk are not entities that everyone sees in the same way. In the context of hermeneutical phenomenology, the researcher is characterized as the instrument of data collection and analysis in qualitative inquiry (Patton, 2002). Hermeneutic phenomenological researchers design interview protocols using their knowledge of the relevant literature, their familiarity with the context in which the topic of study is situated, and their curiosity about the topic. They act as data collection instruments during interviews when they ardently attend to the responses of the interviewees and follow up on particularly significant remarks with relevant probing questions.

A researcher can approach the experience of people in contemporary organizations through examining personal and institutional documents through observation, through exploring history, through experimentation, through questionnaires and surveys, and through a review of existing literature. If the researcher's goal, however, is to understand the meaning people involved in education make of their experience, then interviewing provides a necessary, if not always completely sufficient avenue of inquiry (Seidman, 2013, p. 10).

As noted by Bernard (2010), this form of semi-structured—or in-depth interview process—is a scheduled activity; it is open ended but follows a general script and covers a list of topics (p. 210). In addition, a unique component of the interview structure laid out for this study is the inclusion of conversation during each session.

Interview data was audio recorded, videotaped, transcribed and coded utilizing the Microsoft Word software package. The objective of the analysis was to identify emergent themes and describe those themes thoroughly within the phenomenological theoretical framework.

### **The Method**

The intent of this study was to examine what it's like to be a game-using teacher and how the integration of video games in their classrooms has influenced their teaching practices. The goal was to reach the heart of the experience, gaining rich and thick descriptions of the subject matter under investigation (Moustakas, 1994). An interview guide—a written list of questions and topics that needed to be covered (See Appendix A for interview protocol) was employed.

Seidman (1991) suggests three separate interviews: the first interview concentrating on the individual's life history; the second interview addressing the details of the individual's experiences; and the third interview exploring the meaning of these experiences. However variations of these can be acceptable “as long as a structure is maintained that allows participants to reconstruct their experience within the context of their lives” (p. 15). All interviews were conducted face-to-face and strove to follow Seidman's interview protocol (Seidman, 2013), but was largely dependent on whether the participant exhausted their anecdotal narrative pool surrounding the experiences under investigation. Separate interviews may not always be feasible, due to the inherently busy nature of the teaching profession. As acknowledged



previously, teachers are extremely busy and their time is precious. Ultimately, this proved to impact data collection, as the pool of participants could only spare enough time to participate in one to two interviews. Observations were not achievable with each and every participant, either. Among the teachers, there was almost unanimous vocalized concern regarding time to conduct the interviews.

Taking these factors into consideration, I condensed the interviews, focusing on Seidman's three areas: 1.) Life history as an educator; 2.) Details of their experiences with video games in their classroom; and 3.) Reflection on the meaning. It should also be noted that all participants were interviewed in an identical, systematic approach—chronological order, starting with questions from area #1 before moving to areas #2 and, then, #3. I started with the minimum number of participants first and repeated this method until saturation could be achieved.

Prior to conducting the interviews, each participant was briefed of the purpose of the study, why they were selected, and apprised of the expected duration of said interview. This was achieved via a short verbal overview of the research prior to signing the consent form. Moreover, personal copies of the consent documents were provided to the volunteer participants after the session.

The composition of the interview session(s) started by focusing on background / biographical information and then transitioned to their professional experiences (namely, experiences with video games, both in the classroom and at home / for leisure), which, then, culminated with an opportunity to reflect on what had been discussed.

More specifically, phase one of the interview(s) began with questions about the teachers' lives (their history in the field of education, the grade they teach/oversee, etc.), as well as

describing their professional work space (discussing school policies, curriculum and standards, as well as details regarding the layout of the classroom).

The second phase of the interview(s) focused on the utilization of educational video games in the classroom with emphasis on their experiences, their successes, their failures, and their opinions about the educational video games they use.

The final phase was allocated for teachers to reflect on what was discussed, giving participants the opportunity to clarify items that were addressed earlier. Time was also allotted for follow-up questions or additional anecdotes participants wanted to share.

The interview(s) were semi-structured, allowing for the opportunity to clarify the meaning of what was being communicated. As a result, there were slight differences across interviews. All interviews were documented in both audio and video formats, which helped in developing a more robust description of participant experiences.

Data saturation is integral to qualitative research (Corbin & Strauss, 2014; Guest, Bunce, & Johnson, 2006), as it entails bringing new participants into the study until the data set is complete, as indicated by data replication or redundancy (Bowen, 2008). After saturation was achieved (Kvale, 1996; Patton, 2002; Strauss, 1996)—no new categories of data appeared—the data collection phase drew to a close and the study moved on to analysis of findings.

### **Data Triangulation**

Aside from conducting interviews—which, from a phenomenological standpoint, yields the richest data, this study also employed supplemental data triangulation in the forms of *observations*, *field notes*, and *member checking*. These other forms of data helped to support / refute the interview data.

Due to the fact that this was a hermeneutic phenomenological study with emphasis on the culture of teachers, each of these triangulation methods placed specific emphasis on the language these teachers use inside and outside the classroom setting. Gadamer's (2004) work with hermeneutic phenomenology cites the significance of language, as well as the nature of questioning and the role of conversation in the tradition of human understanding. This study sought to examine how these teachers describe their experiences—their exposures to video games and its culture, as well as the ways in which they situate themselves as educators as they negotiate between their lifeworld and the lifeworld of their students.

Observations, too, added a relevant dimension concerning the formative range of phenomena. These observations were conducted in classroom settings, but were not filmed. Field notes were employed during observation sessions.

Lincoln and Guba (1985) describe member checking (also known as a participant validation check) as a technique to [review]...interpretations and conclusions with members of those stakeholding groups from whom the data were originally collected (p. 314). Following the transcriptions of the interviews, I consulted with the participants to review the transcripts to assure that they had not been misrepresented.

### **Data Analysis**

"Analysis is the search for patterns in data and for ideas that help explain why those patterns are there in the first place" (Bernard, p. 452). "In qualitative research, the actions and perceptions of participants are analyzed for their expressions of meaning within a given context" (Jensen, 2008, p. 112). Regarding my thematic analysis, I identified categories, themes, ideas, views, roles, etc. with the purpose of identifying commonly shared resources or shared patterns of communication.

When employing hermeneutic notions of phenomenology, the unit of analysis falls not on the individual but on the interaction between the individual and the contextual or situative nature of the experience. Interpretations are filtered through a specific cultural, social, and historical lens, which also considers the relationship between researcher and researched—the interface between subject and object (Finlay, 2003). In this study, the units of analysis were the social artifacts (i.e., the descriptions by teachers about their interactions with students that involve video games as well as interactions with video games themselves). This study was not intended to explore every facet of the teacher lifeworld, but focused particularly on moments where the topic of video games were experienced and how these individuals responded to that experience. Initial analysis focused on those specific moments. They were organized into emergent and essential themes (van Manen, 1997) while bringing to bear the phenomenological lens, which will be discussed later in Chapter 3.

Qualitative analysts have to immerse themselves in the material being studied, which is typically done by reading and rereading the transcripts until the researcher is truly familiar with them—a process which is necessary as a preliminary coding procedure. Naturally, the categories used for coding will clearly be determined by the questions of interest. Additionally, Gill (2000) recommends that the initial stages of phenomenological coding should be done as inclusively as possible, so that all borderline instances can be counted in rather than out.

Consistent with the practices of qualitative analysis, the aim of the researcher is to interpret participant expressions through a coding or meaning-making process. In this coding process, I looked for messages that were consistent with, confirmed, or expanded upon current knowledge and theory. With the initial coding completed, the comprehensive analytic phase began, which was undertaken in two phases. Firstly, I searched for patterns in the data in the

forms of variability (differences within and between accounts) and consistency. Secondly, there was the forming of tentative hypotheses about the functions of particular features of the phenomenon, and checking these against the data (Potter & Wetherell, 1987) (as cited by Gill, 2000).

After data was been collected and transcribed, the first step of analytic procedures entailed developing a codex—an organized, indexing system that was used to reference specific unit locations within the transcripts. As it relates to its creation, I had to decide upon units of reference, which are traditionally the smallest unit of text that can be accessed via an index reference system. Each paragraph was thematically coded and served as a reference system for locating and retrieving units of text—they were not part of the analysis, but served as the basis for analysis (Patterson & Williams, 2002).

The next phase of the coding process dealt with identifying units of data or ‘meaning units’, which are “words, sentences or paragraphs containing aspects related to each other through their content and context” (Graneheim and Lundman, 2004, p. 106). In conducting this process, I horizontalized these meaning units. Moustakas (1994) notes that, during the process of horizontalizing, every statement is treated initially with equal value. It is only later that statements irrelevant to the topic and question or those that are simply repetitive or overlapping are deleted, leaving only the Horizons (the textural meanings and invariant constituents of the experience); Clustering the Horizons Into Themes; and Organizing the Horizons and Themes Into a Coherent Textural Description of the experience (p. 97). To summate the qualitative processes of coding, sorting, identifying themes and relationships, such analysis includes the following: it identifies descriptions (Thomas, 2006); it clusters content into discrete categories

(Tonkiss, 2004); and, taken together, these describe the "essence" or core commonality and information structure of the message being conveyed (Dahlberg, 2006).

The intent of coding is data reduction—not data proliferation (Bernard, 2006)—and, drawing from such insights, we can make statements about the context under study. This is achieved by incorporating additional processes into the research design that verify the truthfulness or meaning being asserted in the study—called confirmability (Jensen, 2008). Confirmability refers to the repeated direct participatory and documented evidence obtained from primary informant sources (Leininger, 1994). In other words, confirmability entails obtaining direct and recurrent affirmations of what the researcher has heard, seen, or experienced with respect to the phenomena under study and includes getting evidence from informants about findings by the researcher or interpretations (Leininger, p. 105).

Confirmability is an accurate means through which to verify the two basic goals of qualitative research: (1) to understand a phenomenon from the perspective of the research participants and (2) to understand the meanings people give to their experiences. Confirmability can be expressed as the degree to which the results of the study are based on the research purpose and not altered due to researcher bias. (Jensen, 2008, p. 112)

Concerning researcher bias from a phenomenological standpoint, I strived to be free of biases by employing methods to ensure that claims depicted the world accurately and objectively without the biases of the observer/knower (Given, 2008). Bias can be diluted, however, by implementing member checks with the participant pool, which is a technique that was employed in this study.

Selected participants were asked to review some of the coding and meaning-making process to determine whether my interpretations were consistent with their perceptions (Jensen, 2008, p. 112). This is referred to as member checking (Hoffart, 1991; Leininger, 1994) and involves taking one's interpretations back to selected participants to confirm the accuracy of the

final framework. How researchers confirm what they have seen, heard, or experienced may vary, but...actual *repeated* [emphasis added] instances, voice inflections, and nonverbal communication are among the indicators of confirmability (Leininger, p. 105). The process of member checking allows the selected participants to argue, extend, confirm, or re-examine certain data or findings.

### **Theoretical Lens**

As it pertains to the theoretical lens—the orientation, which supports the research question and provides a way of looking at the world (Marshall & Rossman, 2010)—I referred to a phenomenological lens. Phenomenological research is a lived experience for researchers as they attune themselves towards the ontological nature of phenomenon while learning to “see” pre-reflective, taken-for-granted, and essential understandings through the lens of their always already pre-understandings and prejudices (van Manen, 1997).

### **Ethical Considerations**

Ethical considerations are important to any study that deals with human participants. This study adhered to all guidelines of Penn State University's Institutional Review Board (See appendix B for approval letter from IRB). The research process can create tension between the aims of research to share stories for the good of others and the rights of participants to maintain privacy (Orb, Eisenhauer & Wynaden, 2001). Due to the nature of my data collection technique (e.g., video recording), participants were informed of the use of video equipment and asked to sign a consent form prior to filming. Teachers were also be briefed that snippets of these interviews could be compiled for presentation among the scholarly community. In an effort to reduce the impact of individual identities during the display of the

video and audio data, names will be removed. Basic pseudonyms were created to further protect the identities of the participants but to maintain narrative strength in the final dissertation.

Interviews were recorded in audio and video format. The files were recorded using a digital audio recorder, as well as a mini-DV video recorder, which were, then, transferred to a privately owned, personal laptop. The audio files were converted into mp3 format and transcribed using Transcribe by Wreally. When transcribing posed difficult due to hardship understanding what was being communicated, I referred to the video files. Transcripts were saved as Microsoft Word documents, which, allowed a seamless transition for coding. Afterwards, these files wer moved to a password-protected 1TB portable hard drive. In addition, the digital transcripts of these interviews were password protected and stored on the same external hard drive. Upon the completion of this study, the hard drive will be stored away in a locked cabinet and protected.

**Study Limitations:** Qualitative research of this nature is not generalizable. The findings of this study were constrained to the participants and the interpretations of the investigator.

### **Researcher Identity**

A veteran motivator, humorist, and educational consultant by the name of Ignacio "Nacho" Estrada once stated, "if a child cannot learn the way we teach, maybe we should teach the way they learn." I believe that video games may bridge performance gaps, regardless of age, gender, learning style, etc. I am of the view that video games provide opportunities for engagement, stimulation, complexity, strategy, collaboration, exploration, and competition.

As a gamer myself, I relish the open-ended nature and freedom that video games provide. They allow my mind to break free of the constraints of the real world and test different



ideas that I might not be able to do otherwise. I have personally felt the empowerment of gaming in my own life and, as such, I have a particular bias that is a part of my interpretive lens.

In addition, I would like to share some insight into my background as an educator. My professional background falls upon a Bachelor's Degree in Elementary Education and a Master's Degree in Instructional Design and Technology. I have taught at the Elementary level in public schools, interpreted exhibits for the New Jersey State Aquarium, and taught undergraduate students at an assortment of academic institutions, including Penn State University. My experience as an instructor and facilitator is quite diverse, to say the least.

I follow a personal mantra of seeking to create a learning space that challenges students to reflect upon the material being explored via a hands-on approach to learning. I aim to challenge students by promoting an inquiry-based approach to problem-solving and helping guide students toward achieving the correct answers on their own. I continue to strive to step away from the traditional, bottom-down style of instruction and empower my students by helping them take ownership of their own learning.

Gibson, Aldrich, and Prensky (2007) state, "educators and instructional designers alike need to be shown, convinced, and supported in their consideration of the promise of games and simulations in physical and digital learning environments. They need to see research and development frameworks that are grounded in generally accepted educational theories" (pp. ix-x). The dynamics of learning and instruction are evolving and video games show promise among the changing dynamics of our education system. As both a teacher and one who plays video games, I am open-minded towards the notion of video game integration in instructional settings. With this in mind, I also want to acknowledge that I am also open to hearing less

positive things from my participant pool. In fact, I have grappled with the addictive nature of video games—particularly MMORPG's—which grants me a balanced view of the topic.

### **Summary**

To review chapter 3, this section effectively described the rationale for a hermeneutic phenomenological approach, as well as the methodological framework to be employed in this study. In addition, the participant pool and sampling protocols were discussed, as well as specific data collection techniques, sources of data, analysis methods, and confirmability (Lincoln & Guba, 1985) strategies were discussed. Lastly, the researcher's identity was described as it relates to the research study. The chapters to follow will present the findings of this research, discuss their implications, and offer suggestions for subsequent research.

## **Chapter 4 – Results and Discussion**

This chapter gives a brief outline of each participant and identifies the types of educational video games these teachers are using in their classrooms. The most dominant educational video games employed by participants are as follows: 1.) Kahoot, 2.) IXL, and 3.) Quizlet. In addition, key themes arose from the interview data. These themes detail challenges teachers face as they relate to the utilization of video games and include: 1.) Allocation and Lifespan of Devices, Limitations of Resources, and Lack of Funding; 2.) The Struggle for Time; and 3.) Video Games Disrupting the Managed Classroom. Results and interpretations are structured with relevant participant verbalizations and notes from my observations.

### **Biographical Sketches:**

I conducted interviews with 15 teachers from mid-Summer to late-Fall of 2017. I organized my labeling scheme based on the chronological order in which I interviewed each participant. Consequently, I refer to each participant by the numerical label of 'Teacher #1 through #15.'

The following describes the pool of teachers sampled. These teachers range between the ages of 29 and 53 years old. Eleven of the participants are female. Four of the fifteen participants are male. Roughly half of the teachers interviewed have been using video games with their instruction for at least five years. To date, these teachers' careers span between 7 to 28 years of experience. The longest number of years cited using video game was reported by Teacher #1 (25 years)—specifically, she recalled employing *The Oregon Trail* as the first video game in her classroom.

All teachers work in public schools and vary between suburban areas and slightly more urban settings of Southern New Jersey and Philadelphia, PA. Five teachers work in Cherry Hill, NJ (# 1, 3, 4, 9, and 11). Four teachers work in Blackwood, NJ (# 7, 8, 13, 15). Two teachers work in Burlington City, NJ (#6 and 14). Another teaches in Millville, NJ (#5) and another from Atlantic City, NJ (#2). Two teachers work in and around Philadelphia, PA (# 10 and 12).

**Figure 1: Profile of Participants**

<u>#</u>	<u>District</u>	<u>Grade</u>	<u>Subject(s)</u>	<u>Age</u>	<u>M/F</u>	<u>Ethnicity</u>	<u>Years teaching</u>	<u>Years using VGs</u>	<u>Preferred VG</u>	<u>Observed</u>
1	Cherry Hill, NJ	4	Math, Science Social Studies	53	F	White	27	25	Kahoot / Reflex Math	N
2	Atlantic City, NJ	K-6	Technology	49	M	White	13	5	Kahoot	N
3	Cherry Hill, NJ	3	Reading, Writing, Math, Science Social Studies	50+	F	Black	13	5	Kahoot	Y
4	Cherry Hill, NJ	K	Reading, Writing, Math, Science Social Studies	29	M	Black	7	5	ABCya	N
5	Millville, NJ	K-5	Music	51	F	White	28	7	Joy Tunes Recorder	Y
6	Burlington City, NJ	2	Reading, Writing, Math, Science Social Studies	46	F	White	10	5	ABCya	N
7	Blackwood, NJ	8	Math	43	F	Black	22	11	Kahoot	N
8	Blackwood, NJ	6-8	Nutrition	43	M	White	21	6	Kahoot	Y

9	Cherry Hill, NJ	7-8	Special Ed. Reading, Writing, Math	30	F	White	8	5	Hygiene Sim	N
10	Fallsington, PA	8	Math	36	F	White	14	10	Study Island	N
11	Cherry Hill, NJ	6-8	Math	44	F	White	22	7	Kahoot / Smartboard	N
12	Philadelphia, PA	8	Math	65	F	White	27	8	Lure of the Labyrinth / Study Island	Y
13	Blackwood, NJ	8	Science	44	M	White	22	22	Commercial Games (Simulations)	Y
14	Burlington, NJ	6-8	Math	30	F	White	7	5	Kahoot	N
15	Blackwood, NJ	8	English	53	F	White	12	5	Quizlet Live	N

Across the gamut of interviews, I was able to acquire representatives who cover the span of grades K-8. The subjects these educators teach include Reading, Writing, and Math, Social Studies, Science, Technology, Music, and Nutrition.

As it relates to the schools these teachers work in, many described the conditions as lower tier on the socioeconomic ladder. Teacher #1 cites a 30% rate of free and reduced lunch among the students in her school in Cherry Hill, NJ—qualifying the institution as a "Title 1 school". Teacher 7 makes a similar statement about the schools in Blackwood, NJ. She says, "my school is a Title 1 school...we are over 50% free and reduced lunch." Teacher 5 shares this commonality, commenting about Millville, NJ, which is not far from the other districts. She, too, acknowledges, "80 to 85% of our kids are on free and reduced lunch...our poverty level is pretty high." Teacher 6 also paints a similar story: "My district—I like to call it '*low income / no income*'. We have a lot of disadvantaged kids. They come from broken homes. A lot of single

parents. A lot of them at a young age are having to be totally independent at home, so the nurturing piece is missing."

Lastly, every single teacher that I interviewed acknowledged no training as it relates to video game use in their classrooms. They described their finding of said tools as either self-discovery via online research or peer collaboration, in which they observed or heard about certain educational video games from their colleagues in the school. These teachers acknowledged a 'trial and error' process of video game implementation—one that entailed refining, reshaping, and retooling.

### **Development of Themes**

The purpose of this section is to bring to light themes that arose from the data using the analytical methods described in Chapter 3. This analytic approach includes identifying recurring reports, as well as deductions from the process of coding and thematically combing every transcribed interview. This occurs when members of the participant pool share experiences that may not contain identical elements at face value, but, when analyzed, reveal shared underlying themes that are consistent with one another.

The purpose of this study is to investigate in-service teachers' experiences with digital educational games, so the focus of analysis is on the anecdotes that paint a thick description of their experiences. In many cases, the themes reflect what it means to be a teacher, as well as the issues involved with making video games a part of the classroom culture. What follows is explication of those experiences—a detailed picture that became increasingly clearer as I analyzed all of the experiences of these teachers. This section includes detailed anecdotes, as well as reduced narratives to highlight instances of recurring or emergent themes.

### Teacher, School, and Student Context

Before I delve into the types of educational video games these teachers use, I provide some background on the teachers' observations, opinions, and motivations, which will help provide some context for the themes that follow.

As noted in the biographical sketches, the districts these teachers are a part of are not as affluent as others. In light of this, these teachers opened up and shared their observations of the struggles of their students. During coding, I made note of stories that detailed lack of support at home, struggle, loss or tragedy, lower confidence, and approval seeking on the part of the students. Teacher 2 relayed one such account:

It could be a home issue and I have a lot of that at my school here... I mean there's a lot of issues from home. Usually, one parent most of the time—not most of the time—much of the time. Um, a grandparent is taking...or an aunt is taking care of the child. Um, I had a girl who's... I'm sorry to get off on a tangent but... a girl, who...*she was gone for 4 days*. Let me tell you what happened to her. Her mother got arrested and no one checked on her. She was home alone for 4 days—a 4th grader. So the school is finally like... what's going on? Oh, my mom got arrested.

These stories were not uncommon. Referring back to the concept of a missing 'nurturing piece' as it relates to observable student needs, a number of the teachers described their personal philosophies of teaching as 'nurturers' as the interviews progressed. Teacher 6, for example,

My students all the time...they just—they are constantly seeking some type of approval and the attention. You can tell the difference in a child that...co...who comes in and doesn't have the confidence to do something because there's no-one giving that encouragement at home. So, I'll s—make a point...even making a bigger deal out of something for a child and just saying "wow! that—you did a really great job! I like that you picked that out!", you know? And it just gives them that warm, fuzzy feeling that they may not have all the time, so that's where the nurture piece comes in for me. It's not just...\*snaps finger\* "you got it right..good job..move on." I feel like, at the earlier—the younger ages—they need a little bit more of that, um, almost like that mom piece, if you will.

Teacher 15 adds similar tones to this talking point:

I believe that, as a teacher, it's my job to help as many kids as I possibly can in any way, shape, or form. I believe that, y'know, teaching is something that is not easy and, um, something that is not 9 to 5. However, \*laughs\*, it requires a lot of work...a lot of patience....and a lot of nurturing. And I feel that, if the patience and nurturing is instilled in the teacher, then you get a lot more out of the student.

And Teacher 7 would likely agree, too:

I think my personal philosophy is really, um, its reflected from being a mother and an aunt. I have been a mother for 16 years, I have been an aunt for over 20 years. And, um, ever since I became an aunt, probably 20 years ago at back to school night I always tell parents, that my philosophy is to teach your child, the way I want the children that I love to be treated in the classroom. So it has to do with respecting the child overall, but also knowing when to push them to do better, you know, requiring maximum effort, from a child.

Every teacher expressed personal investment in the livelihoods of their students. Out of the 15 participants, 13 of teachers acknowledged that they were parents—the exceptions being Teachers 4, 9, and 15. Teacher 12 elaborated, stating, "I don't wanna say teachers that are mothers or fathers are better teachers, but I am going to say that. \*laughs\*" Nevertheless, all 15 teachers genuinely expressed their care and personal investment in the lives of their students. This viewpoint also seems to have some interplay with their thoughts about technology and video game integration in the classroom.

Many of the teachers confessed they use video games as a means of connecting to the culture of their students. Take, for example, Teacher 4's social commentary:

They have technology at home. Um, just in the sense, have it also in the classroom and, um...why not? Why don't we teach them how to, in a sense, use it as a research method, rather than just a home tool...to run to... run as a getaway tool at home. They can use it—because they're going to be using them moving forward. You know, we're in that age, now, where every class—kids are having laptops and tablets and cell



phones, so we just wanted, in a sense, to have it incorporated in their learning, as well.

He refers to the technology as a 'getaway' tool that kids 'run to', which seems to imply a discernible appeal among the kids he teaches. A descriptor, such as 'getaway', however, suggests that this teacher may distinguish that laptops, tablets, and cell phones serve as an 'escape', likening them to a different type of experience that the classroom atmosphere had not initially offered. He also uses the term "we"—"we...wanted", which seems to suggest that this was a shared view with fellow teachers and faculty members in his school.

Other teachers expressed somewhat different commentary as it relates to interfacing with students, today. Teacher 2 notes, "every single thing that they [the students]—they do at home... I'm in competition with..." He continues, stating, "I'm not there to entertain children. I do because I'm just naturally a knuckle head...but \*chuckles\*...but, like, that's not the purpose of me being in the classroom." He continues his thought, stating, "but there are some video games where their purpose is just for education...for entertainment and those have their place, too." Teacher 2 dichotomizes the purpose of the video games and his purpose as a teacher. Ultimately, his responsibility as instructor always takes priority—his instruction is goal-driven. Teacher 7 adds to this, saying: "...it is also about meeting kids where they are today. They very much live in the age of technology and video games. So it is about bringing some of their world into the classroom."

The concept of 'Educator vs. Entertainer' is further explored by Teacher 7. This is what she had to say:

You cannot...you can't match, per se, the animation of a video game. You can't match that. You can't. We always say that too, like, I can't compete necessarily with the entertainment value that comes with the video game. Like I'm not an entertainer. You know what I mean? Like I'm a teacher so I can't match some of that but that's why it's good

sometimes...to give them a piece of that if that makes sense. Because I can't, you know, I'm not a cartoon...

For both teachers, they describe a purpose and a place for video games—something that they acknowledge isn't quite achievable without its support. Teacher 13, who aligns his instruction with more entertainment games than the others, had this to say:

I had a principal, a while back, who gave me some great advice on it and he said, "Study the competition." He said, "What are they doing outside of school? And they're coming into school, so bring some stuff from the outside." Y'know, at the time, it was Sponge Bob—was real big. So, I started teaching with Sponge Bob or, uh, using cartoons and stuff like that and it really connects the kids to the class, makes them wanna learn and, then, uh, y'know, we can get some things done. Uh, so I think it should be engaging, it should be hands on.

Teacher 9 cites a similar sentiment. She says, "it's the generation these kids are growing up in and we're not going to beat it....you have to join it. And it's just finding an adaptive way to do it without it taking over a classroom." This statement is almost despondent in a sense. To reiterate, she says, "we're not going to beat it...you *have* to join it." Based on the verbiage that some of these teachers use, they communicate a sense that the change is unavoidable for those in their field.

### **What Teachers Have To Say About Video Games**

The following section details anecdotes by the teachers as it relates to their experiences using educational video games in their classroom settings. The teachers use educational video games for a number of purposes. These include practice, support, review, fact-fluency, assessment purposes, such as a pre-test or warm-up activity, as well as homework assignments. Reflecting on her role as a teacher who uses video games with her instruction, Teacher 3 has this to say:

I see myself fitting as a...um...kind of like a cook. Someone who is constantly going out to seek new and intriguing ways to bring

technology...um...game use—and I love the game use because it's something children are familiar with, something they use at home on a regular basis, something that no matter what kind of technology you give them, if you don't watch them they'll be doing their own thing. They have a way of making it look like they're doing what you think they're doing but they're not always doing that, um...so you have...you have to referee

She uses analogies, such as referring to herself as a 'cook' and a 'referee'. She values the video games, as they are one ingredient in her instruction to spice up her instruction. However, she also acknowledges that video game usage is not without challenges—primarily, getting out of hand and, thus, requiring the need to be a referee and monitor the game play.

According to Teacher #1, "I don't want to say I don't completely buy into them, but I don't...I'm not ready to say "yeah, this can, y'know, take over and look at all the wonderful things that our kids can learn." Um, there is a part of me that is still very traditional, though, I do try to change with the times." She uses games, such as Kahoot and Reflex Math, which are essentially drill and practice type quiz games. Despite the fact that Teacher #1 has used video games with instruction the longest out of all participants, she shares her criticisms—primarily that the educational video games she uses are ineffective at eliciting the level of critical thinking that she seeks to foster in her students. She adds, "You let them struggle and the struggle is where the learning is. And I don't know that video games can provide that—that's the biggest difference. There are things that are challenging in a video game, but you don't really have that struggle—at least not on the ones that I've found."

Sticking to the theme of struggle, Teacher #2 shares a somewhat similar story. However, this experience is more so about *his* struggle as a teacher trying to introduce video game to his group of students. This is what he has to say:

When I first introduce any new program to the kids—cause I am a teacher of technology—any new program is getting the basics down.

*They really don't care about the basics. They really don't care about the basics, they want to have the end. They want to be able to just go ahead and play. Uh, I would find, in general, in the last couple years...kids are way more interested in having fun than they are in learning. So to be able to hook up fun and learning, it's a difficult task.*

Similarly, Teacher #15 notes that an "effective marker (of video game use) would be *how you're using them, how frequently you're using them, and what types of games you are using* because there are games out there that are just fun to use and, then, there are games that actually provide data."

As it relates to frequency of use, some teachers use them more than others. Teacher #5 describes her uses of educational games. She concedes, "It's not the focus of my curriculum. It's used as a motivator. It's used to supplement and it's...it's kind of used to synthesize, as well. Like...like you've learned all these concepts and now it's, like, time to put them together and then play the game using that knowledge you've learned. So, it's kind of like that—it's not the center of it but it's part of it." In this example, #5 uses the video games as practice—considering she teaches Music, one could use the term "rehearsal".

Two things video games are very good at according to many of the teachers is their ability to engage and provide immediate feedback. As Teacher #6 states:

The role I see is just keeping them engaged...keeping them interested and, then, getting the immediate feedback keeps it going—keeps them wanting to be on that, instead of..."oh, what's so and so doing over here?" So it's keeping their focus in one area for a sustained amount of time, as well as training their brain to elicit a more correct response.

As it relates to the feedback, Teacher #7 would agree, stating, "It's creating data...data-driven instruction. That's what it's creating because it can give you immediate feedback and then you say "You know what. I need to see you, you and you." The immediate feedback is an attractive feature according to many of the teachers. As Teacher #15 cites, "there are games out

there that are just fun to use and, then, there are games that actually provide data." She refers to Quizlet Live, stating, "It's a live version of the game and, uh—so it's an interactive right away that I can build my own teams and *I can use the data by seeing who is getting questions right, who is getting questions wrong, individually.*" In this scenario, she is using the data to strategically place students in groups—creating a balanced team of low, medium, and high performers. Similarly, she praises Kahoot for the assessment capabilities, stating,

When I use Kahoot in the classroom, that produces its own little datasheet, which is amazing because that breaks it down by individual student and what they are consistently getting wrong throughout the entirety of the game. So that's a really cool assessment tool because I can see—*Okay. Jimmy, Johnny, and Jane are getting this particular problem wrong. I need to pull them and review that particular game before the test.*

There is a seamlessness to the instruction, as well—as the teachers I spoke with explain, the students don't realize they're learning...they just see it as playing a video game. Teacher #9 shared this response, "A lot of these games I use—yes, as reinforcement of what they're learning, *but they don't realize it.* So, for them, it's a positive reinforcement for doing the proper thing in class and that's following along, enjoying their work, and then they earn this game time." Sometimes, the usage is related to student comfort levels. Teacher #4 shared this insight: "Sometimes with the games, they get more answers than they would in the classroom in general. You know, like, *they might feel more comfortable working with the game* than they would if it's a paper test or if it's a homework assignment or a classroom math equation."

### **Let the Games Begin**

This section describes the types of educational video games teachers reported using in their classrooms. Again, the most frequently mentioned educational video games employed by participants are as follows: 1.) Kahoot, 2.) IXL, and 3.) Quizlet. Common themes, as they relate

to these games, include competition, engagement, motivation, hands-on learning, review and assessment.

## **Kahoot**

Two-thirds of the teachers interviewed use Kahoot. As detailed in the biographical sketches, these educators teach a variety of subjects. The teachers report that the flexibility and universal appeal of the Kahoot platform makes it appealing to them. The game, itself, is akin to Jeopardy. Teachers can input the questions and answer selection, which is presented in a timed Q&A event. It should be noted that teachers can alter the time limit of the countdown clock or disable it completely. The questions are multiple choice and the students compete to be the fastest to respond with the correct score—ultimately, vying for top position on the scoreboard. Students can join a Kahoot session via hands-on devices, such as tablets, laptops, or smart-phones.

Teacher #1 expressed praise for Kahoot, which is reflected in the following description:

Kahoot. K-A-H-O-O-T. And the kids—oh, they love Kahoot. I've always used it more as a review tool...most of them are teacher developed. So if I want to use it, I go in and I write the questions and I setup the answers and it's all multiple choice. I'm telling you—LOVE IT so much. And I could put a hundred review questions—they would not get tired of the discussion when I'll get tired of it. They just love this thing.

The universal praise continued to echo across the interviews. Teacher #3, for example, adds, "Kahoot, *which is the number one to me*—I've shared this with a lot of my colleagues. A lot of them use it in all grade levels except for obviously kindergarten and first grade." She continues, "Most teachers that I know [who] use it have felt the same way. It is a very interactive activity...where it's like they're winning a lottery or something and they get so active." Teacher #3 uses Kahoot in her Science and Social Studies classes.

Likewise, Teacher #8 offers an alternate description. He says:

The one that I do use the most with my 6th graders is called Kahoot. Um, and it's a...it's kind of like, um, the games that you would see....um....like a...oh I'm trying to think—like a...not even a sports bar....like...like TGI Fridays. There's a...there's a little box that you have and...it asks questions. And you answer questions.

In regards to the Kahoot experience, Teacher #10 says, "The kids absolutely do love, um, being competitive and getting on the games and doing things."

Another useful feature related to Kahoot is the ability to create a Kahoot, upload it to a searchable database, which other teachers can, then, download and modify, as needed. It's a gaming resource that includes a multitude of features. As Teacher #10, states, "There's a huge database of Kahoots. And you type in whatever topic you're looking for." The only issue that she acknowledges is, as follows: "the problem about using other people's [games] is sometimes there are mistakes or sometimes it's taught differently or it's not totally covering all of the questions you want."

In sum, I quote Teacher #11, "[The students] love Kahoot. Like all the kids love Kahoot and a lot of the teachers in my school do play Kahoot. It's very popular."

## **IXL**

IXL is the second most mentioned title used by almost every teacher from New Jersey who was interviewed. This is largely due to the fact that the service adheres to New Jersey State Standards and school districts are paying for the licenses for every grade. IXL is a website for grades K-12, that allows students to practice a variety of subject areas including Math, Language Arts, Science, Social Studies, and Spanish. The format is heavily drill and practice-based. There are some game elements, such as a point-based system, scoreboard, and timer. Additionally, the website includes virtual rewards that students can earn, which includes unlockable prizes , such

as digital stickers, stamps, balloon animals, etc. It should be noted, however, that IXL received the most mixed criticism of all identified platforms. Some teachers questioned the legitimacy of classifying IXL as a video game.

Teacher #3, for example, describes IXL, as follows: IXL... is a site that our school has that they can go in and practice and build up their math skills. She continues, stating:

IXL is the students having math...in different skills. [teacher demonstrates] This is odd and even numbers. So, they have timers. And they're submitting in the answer—odd number that comes before sixty? Sixty seven, sixty five, sixty three—so they would type in sixty one and submit and...so, in a way, it's a game. Ummm.. *An educator might not consider it a game, but to the students it's a game and I think I consider it a game.* They...they go as low as kindergarten with IXL. Um...so it's something that they ask for. Again, when they're done and we make it in math, we make it a center that they do twice a week on whatever technology we have in the room...they circulate through to IXL.

Teacher #6 seems to qualify IXL as game-like, largely due to the interactive nature of the platform. She says, "The kind of things that I use are more *interactive*. Like I have a couple of websites, um, IXL.com, which gives math problems...and it's not so much in a video game format, uh, but it gives them exposure in a different way to something that—that's already been taught." The IXL format is grounded in practice and fact fluency. Teacher #7 also seems to question the game-based nature of the software, as she states, "One site that we use—it's IXL.com and this is not really a game, but it's a site and it will give them an explanation of how they got the problem wrong." Sticking to this theme, Teacher #12 says, " There's another site I use: IXL. Uh, *that's interactive in that you're clicking and dragging and graphing.* There's very little game element involved with that." Likewise, Teacher #1 echoes the classification of IXL, stating, "I wouldn't really call them video games..there's a program called IXL. Um, the letters IXL and I don't know what it stands for. Our district pays—there...there is a free component, but



I believe that our district pays to have the more advanced, which allows me to get more feedback, but I don't think of that as video game."

Teacher #11, on the contrary does see game elements in the program.

They do IXL. That's big in Cherry Hill, but that...I wouldn't call that a game, but it's—*it is, I guess*...kind of...like the kids go on, they do sections of Math, right? And, then, they get like, um—just like if you do...you...earn coins on one of your, y'know, games on your phone. They...they earn stickers, so my...my, like, 7 year old. Like, I have him do IXL at home because he...he earns stickers. Like, he'll keep doing sections until he can earn, like, little stickers that pop up on the screen. *It's not that exciting, but it is for them, y'know?*

Here, it's not so much the interactive nature that qualifies IXL as a game to Teacher #11, but rather the reward system. She also acknowledges a motivational aspect when she states, "he'll keep doing sections until he can earn stickers."

It appears as though the digital presentation is attractive to this generation of learners—at least, according to Teacher #7. She offered this insight, as it relates to her 8th graders and IXL, "They don't complain. They don't go "Oh, man!", but if you say "Hey, do 30 questions.", no-one wants to do 30 questions—but if you tell them "Let's spend 10 minutes on IXL practicing" they'll just keep going. They'll just keep going." She adds, "I have 8th graders that are 13 and 14. They'll say "Hey, can I do IXL and listen to music?" "Sure." *Because they're a different generation. Like I needed quiet. They don't so they'll put on their earbuds and they'll just start solving problems right down the line. Solving problems, solving problems, solving problems and then they'll look up and say "Oh, I did 30 questions. Oh, I did 27 questions."*

Hearing stories, like, this, one could argue that the digital interface—the act of clicking, the earning of points, the desire to earn rewards is enough of a draw for learners. Nevertheless, there were several accounts by teachers dismissing IXL as a video game.

## Quizlet

The third most popular game is Quizlet. Much like Kahoot, this can be a Jeopardy style, time based game that fosters quick reflexes and rewards accuracy with a point-based system. Unlike Kahoot, however, Quizlet has different mini-game formats—one of which is flash-card based. The other is called Quizlet Live, which is a synchronous game session, similar to Kahoot, that every student logs in and participates in.

Teacher #15 uses Quizlet Live frequently. She has this to say about the game, "Quizlet is basically a study aid site where you can create your own flash cards. Students can create their own flash cards and, within the Quizlet site, there are games that they can play to learn the flash cards that they're studying and they can use it for any class." One of the ways her students use Quizlet is creating a cumulative set of 60 vocabulary words, whereby "it will give you the definition, a picture, and, then, a chance of words."

The Quizlet site offers different styles of practice, which includes 1.) a regular presentation of digital flash cards that students can flip through it, 2.) another presentation style that alternates between the term or the definition at random, and 3.) a matching game where words or definitions fall from the screen and the student needs to click the right match. Aside from the flash card activities, the main draw is Quizlet Live. Similar to Kahoot, Teacher #15 describes it as follows:

Quizlet Live...it's a live version of the game and, uh—so it's an interactive right away that I can build my own teams and I can use the data by seeing who is getting questions right, who is getting questions wrong, individually. I could also use it as a class. As, how many times they're getting something....a specific skill wrong.

So, I...I would project this onto the board and they'll get a code and, on their Chromebook, they login [quizletlive.com](http://quizletlive.com). They log in the code and, then, it brings them to this game and, then, they play against each-other. So, they'll be, like, a team of four people, it will give the definition and you have to be the first one to click on the thing and,

then, y'know, we normally award bonus points on the test for the highest scoring team.

She also adds, "When we don't do Quizlet, they fail the tests." Unlike Kahoot, which is individual based, Quizlet Live opts more so towards a team-based dynamic. This leads to less divisiveness among students and fosters cooperation, as opposed to competition. Teacher #15 also applauds Quizlet Live for fostering communication skills, as she frequently observes her students debating with one another, as it relates to selecting the right answer.

### **Miscellaneous Other Games**

Kahoot, IXL, and Quizlet were the three main games discussed by the participant pool, but there were other games mentioned, as well. These titles were not reported as heavily, in comparison. This section reports what these games are and provides a brief description of each. These include ABCya, Study Island, and Lure of the Labyrinth.

#### **ABCya**

ABCya is both a website and an app that hosts a variety of games and activities that students, pre-Kindergarten through 5th grade, can play. These are all short, simple games that revolve around subjects, such as math and literacy—in particular, letters, numbers, holidays, and typing reinforcement. Teacher #4 describes ABCya, as follows:

Umm...so....ABCya has a variety of games that they can choose from. It's not just one style. So, it—depending on what skill that you're working on—if you're working on odds and evens or number patterns, it may be a different game for each thing. So if they click on that game—if it's a race car thing, they have to answer questions correctly to get the car to go and to try and win a race. Or it may be shooting a basket. I've done a couple with grammar that, um, rely on them choosing the correct answer in order to shoot a basket and get points.

More precisely, as it relates to math, the games entail addition, subtraction, multiplication, and division, as well as fractions, geometry, and number and pattern recognition. As it relates to literacy skills, the games entail letter or word recognition, phonics, reading, and spelling.

In addition, there are two pricing structures—free and subscription-based. When teachers opt for the free version, ads are present on the website and during game-play. If a teacher opts to pay for a subscription, the ads disappear.

### Study Island

Study Island is a drill and practice platform that follows the premise of getting so many questions correct and, then, being rewarded with a mini-game of the learner's choosing. It adheres to the Pennsylvania State Standards and is reported by participants to be a required part of the math curriculum. Teacher #10 offers the following description of Study Island:

We use this program called Study Island, which practices, um, problems for the...the state-wide testing for the PSSA's (Pennsylvania System of School Assessment) and, also, for the Keystone...the Algebra 1 Keystone Exam. So the kids, um, have to go in—and, at first, the kids have to go in and take, like, a diagnostic test or something like that, but after they take the diagnostic test, you know, I can assign certain standards for them to work on: solving equations...y'know, order of operations....solving inequalities....different things like that. So I can, y'know, tell them to go in and do 20 problems and they'll always say "Can I play in Game Mode?" and the ans—I'm always like "Yes. The answer is yes." So, when they do a problem...if they get it right, then they have the opportunity to play a game after that problem.

The games, themselves, are not the focus, however. As acknowledged by Teacher #10, the appeal of Study Island is the alignment to State Standards and the ability for students to practice for the Pennsylvania System of School Assessment exams. The PSSA's are a standardized, criterion-referenced test that measures student and school performance—primarily, as it relates to proficiency of skills in adherence with academic standards.

## The Lure of the Labyrinth

The Lure of the Labyrinth is, perhaps, the most game-like of all the titles brought to light during this study. By this, I mean it is aligned closer to commercial video games compared to the drill and practice and short/simple games that were the bulk of reported games used by teachers. The Lure of the Labyrinth, however, was only being used by one teacher—Teacher #12. Where Study Island adheres to State Standards, The Lure of the Labyrinth adheres to National Standards. It is a puzzle-based math game designed for middle school students. The game follows a story—namely, the player's pet has gone missing and it's up to them to navigate a maze filled with monsters, encountering challenges along the way, and unlocking secrets and items that will help them further their quest. Teacher #12 describes the game, as follows:

The Lure of the Labyrinth is an abstract thinking game. [It] is teaching you how to think mathematically. Alright, so you can play the game or you can play a puzzle. You know what's awesome about this? They give absolutely no rules...there's no directions, whatsoever. There's no directions in the Labyrinth, either. Uh, you wander through this Labyrinth. Again, students that are better at video games than others—and I'm not a gamer. Y'know, based on my age. [chuckles] I'm not a gamer at all. It's all Math. It's all Math. And, uh, the....they tell...they're common core based in that it's discovery.

This game follows a storyline, which is closer in design to its commercial counterparts. It acts as a draw—a motivational buy-in. Furthermore, Teacher #12 explained that the designers of the game encouraged group work, which promotes collaboration and peer support. A key limitation, as it relates to this game, is the amount of time one needs to invest to make progress.

Fortunately, the game saves student progress, so they can continue their journey in future lessons.

## Moderation

As explored in the previous section, there were favorable stories on the part of teachers as it relates to adopting these educational video games in their classrooms. However, many of the teachers that I spoke to also communicated limiting the time their students spend playing video games. Using them in moderation was a central theme communicated to me. Teacher 6 says,

I think you have to be aware of the amount of time you're allowing kids to interact digitally. As much as it's a part of our world, every—everywhere and these kids, at really young ages, have cell phones that they do games all the time—I still feel like there's a time and a place for it. So, your exposure in the classroom to a digital content, as far as, like, an interactive game, *I don't think should be more than fifteen minutes...* just because it's—you know, that's not the end all, be all...you still need to see that there are other ways in other areas to see something.

During these interviews, most teachers used the sessions as a platform to comment, praise, or criticize certain elements of technology and video games, as well as their thoughts about the culture of kids, today. Half of the opinions revolved around teachers meeting students where they are at. The latter half articulated similar views, but explicitly touched on restrictions and setting boundaries regarding implementation. All of these teachers perceive value in video game usage, but some do not see them as the end-all, be-all. Teacher 1, for example, does not completely buy into video game usage in her 4th grade classroom. She speaks about the current generation of kids, in general. Her chief criticism is that technology—not just video games—fail to elicit the degree of critical thinking and problem solving that she would prefer. She states:

I feel like this new generation—while they need to learn to think differently, which I absolutely believe, uh, I also think that, with the current technology, we have lost the ability to think deeply and focused for a long period of time. And, so, that's why—although I will—I do include the games. I also think they need to not be on technology 24/7 and to have a variety of things and things that require stamina and even things that aren't fun. yeeh....Everything is quick, everything [snaps fingers]. And I feel they need to sustain their, um—not just their attention, but their focus—even on a task--and the video games do NOT require that. They are—everything is quick and flashy [snaps fingers] —and and that's fine because—I do use them because

they engage the kids. So...and that's another, y'know—you battle that. Well, this is going to work to engage them. Then, it's, I mean...engagement is y'know, half the battle. So....so I would say I'm somewhere in the middle.

**Performance Gaps and the Bridges Teachers Build**

After speaking with these teachers, a number of themes emerged. This section details three themes related to performance gaps that teachers face pertinent to their experiences using these digital educational games. In addition, some teachers shared with me how they are attempting to bridge these gaps. Many of these teachers appear to be unwittingly employing instructional design techniques in their classrooms.

**Theme 1: Allocation and Lifespan of Devices, Limitations of Resources, and Lack of Funding**

As described in the biographical sketches, many of the teachers are working in districts that fall lower on the socioeconomic ladder. The majority of teachers professed school budgetary concerns as a factor when employing video games as a teaching tool. Despite some limitations of accessible resources, every teacher I spoke with acknowledged having access to technology in one form or another in their respective classrooms. The following chart details the breakdown of technology allotment for these educators:

**Figure 2: Technology Allotment for Each Teacher**

<u>#</u>	<u>Devices</u>	<u># of students</u>	<u>Allotment</u>	<u>Keep or Borrow</u>	<u>Frequency of use: minutes / days / weeks</u>
1	Chromebooks	20	5 Carts of 27 (1 cart per grade)  Shares with 3 other teachers	Borrow	15-20 minutes, At least 1 day per week

2	Chromebooks	330 in a year	Carts	Keep in classroom	20-30 minutes (out of 45 mins)
3	PC (2) Kindle	22	Tech stays in classroom	Keep in classroom	10-15 minutes per student, every other day
4	I-pads (3) Smartboard	15-20	Tech stays in classroom	Keep in classroom	20 minutes per week
5	I-pads (10) Smartboard	450 (34 classes / wk)	1 cart of 10 in the classroom	Borrow	40 minutes per week
6	PC (4) I-pads (cart) Laptops (cart)	18	Cart (can probably get 15)	4 desktops in room Borrows from cart	15-20 minutes, 1 day a week *rotates kids
7	Chromebooks	25 (3 classes a day)	1:1 Devices	Students have their own laptops	10 minutes Weekly *not daily
8	Chromebooks	800 in a year	1:1 Devices	Students have their own laptops	1 class / 12 day cycle
9	I-pads PC (2) Projector Smartboard	4	1:1 Devices	Students have their own laptops	15 – 20 minutes Weekly *not daily
10	Chromebooks	20-30 (5 classes a day)	1:1 Devices	Students have their own laptops	35 minutes Weekly *not daily
11	Chromebooks (cart) Smartboard	20-35 (5 classes a day)	Cart	Borrow *Pushes cart around Library	1 day a week
12	Chromebooks Smartboard	28-30 (5 classes a day)	1:1 Devices	Students have their own laptops	Twice a week *Classes were cut from 90 mins to 60
13	Chromebooks Smartboard Nintendo, Sony, Microsoft, Retro systems	20-30 (3 classes a day)	1:1 Devices	Students have their own laptops Keeps commercial games in classroom	30-40 minutes out of 84 minute class
14	PC (3) Laptops (10) Smartboard	8 (5 classes a day)	Tech stays in classroom	Keep in classroom	20-30 mins / once a month 45 minute class
15	Chromebooks	20-22 (3 classes	1:1 Devices	Students have their own laptops	15-20 mins / Twice a week



		a day)			84 minute class
--	--	--------	--	--	-----------------

Upon review of this table, one can see that every teacher is equipped in some capacity with technology that they can use to host educational video games. Almost two-thirds of the schools are using Google Chromebooks and part of district initiatives to provide 1:1 devices to their students. What this means is that each student rents a laptop for the year—they carry it like a text book to every class throughout the day, they bring them home, and use them as needed both in school and at home.

The remaining one-third of teachers in my participant pool stated that they rely on the scheduling and renting of tech carts, which can interfere with their plans to implement video games in their instruction. This is some of what those teachers had to say about their experiences. Teacher 1 notes, "We don't even have access all the time. It's not one-to-one, so *I share one cart of 27 chromebooks with 3 other teachers.*" She continues, stating:

Money is a big thing...our cart is *80 kids in and out of that cart every day....pulling them out, plugging them in...they fall....they break. And the kids are really good with them, but y'know, computers fall...they break....it happens. It happens to adults, but it definitely happens to 9 year old kids. I mean our 1st graders use them. It's not like the kids aren't trained early, but they break and, if the district is not willing to replace them---so, like I do know that our PTA is currently raising money to buy two more carts, but that takes a long time. It's a lot of money.*

Teacher 2 adds to the narrative, citing, "I'm severely hampered in the school that I'm working in. They just don't have the resources for it. I mean *I teach technology...ask me if I have a technology lab—No, I do not. We use Chromebooks and we have carts. So the future technology are the Chromebooks.*" He continues, saying, "This works great for some things—works great for Google products...not so great for Microsoft products and, so, I find that a big hampering."

Based on the testimonies of these teachers, money is a hurdle for these and other participant school districts. Additionally, when a district does invest in new technology, it's a choice of one manufacturer versus another—for example, Apple products vs Microsoft products. The schools have to make a choice—a decision that budget largely plays into. However, some schools have a mish-mash of devices. Teacher 12, who teaches at a tech-heavy school in Philadelphia, offers her own insights on the subject. She states:

Every student has an electronic device. Now, depending upon where they are, some of my students have I-pads and some of my students have Chromebooks 'cause that's something we bounce back and forth. Like people go back and forth between Fios and Comcast, we go back and forth between Apple devices and Chromebooks. I'm sure they get deals. I'm sure sales people come in and sell them a bill of goods. Y'know, "We'll give you fifty free devices." I don't know what the deals are, but knowing how I go back and forth between Fios and Comcast, I am sure it's something very similar. I'm sure they get deals of some sort.

This appeared to be a more common occurrence amongst schools that have a longer history of integrating technology in their buildings. An alternative practice at schools that do not yet have 1:1 devices is the dividing of resources via carts per grade. However, many teachers expressed dismay about this practice. This was largely due to scheduling conflicts and the hassles of securing a cart when needed. Working with mixed devices pose their own inherent issues, which teachers vocalized. However, aside from working with outdated equipment, others voiced their opinions about unreliable Internet within the school. Teacher 3 described her experience as follows:

Our building is an old building that has very antiquated interfacing—I'm sorry, old interfacing, which means sometimes our Wifi is slow...overloaded. If we have a lot of people in the school using internet, it's slow—it's not like what they're used to at home. So that discourages them [the students] because, then, it becomes...they're constantly saying: "I can't get the computer to work, I can't get the

computer to work!" and it's not really the computer...it's the Wifi. So, they're discouraged.

Not only are the teachers sharing laptops via carts, but they're also sharing Internet bandwidth, as well. These factors put a strain on the ability to deliver dependable video game experiences in their classrooms. Teacher 14 shared a similar account with similar student disheartenment. This is what she has to say:

I actually had one kid on this week. I don't know what happened to his laptop. It's—the Internet worked and, then, it didn't. And, then it worked and, then, it didn't. Um, yeah, I don't know. It just...it take...*they'll take forever to load*. They won't let the kids login. It will be running low on resources, which means that too many people logged into it before it got restarted.

Teacher 10 shares a similar story, but in her account, it wasn't the students who ultimately felt frustrated. Rather, it was her peers—fellow teachers—who were discouraged that they could not get the Internet to cooperate in their favor. She says:

When...we did Study Island, *it was a nightmare* because, um, only, like, 15 out of the 30 kids would be able to get onto their computers at a time. We skipped this message across the screen that said "Pennsbury Domain Not Available" and, um, after a while, teachers would just, kind of, start giving up because it wasn't working the way...the technology wasn't very, um, reliable in the past and you never knew whether all of the computers were going to work or if all of the internet was going to work at the same time.

She later adds:

I do worry that the technology won't work at the moment in time in which I'm going to do it, so I would say that I...that would probably be why, if you were to interview people in my district, why it is they haven't tried it is the reliability.

The universality of Internet woes continued with each interview. It should also be noted that every educational video game that these teachers use is hosted exclusively online. Due to this, if

there are interruptions in the service, these teachers are at the mercy of bad timing and the inability to facilitate the lesson, as originally planned. Teacher 6 adds:

If the Internet goes down, that's always an obstacle. You don't have any control over that. There have been times where the Internet has gone down and we've had, you know....your whole lesson is based on using the smartboard and a powerpoint presentation. Well that's shot to hell [laughs]...now it's time to go a little old school, so now it's like "alright, what's your plan B? Let's see what we can pull out of our pocket now?"

The Internet connectivity is certainly an unforeseeable scenario. Sometimes, there are external forces beyond the realm of over-extended bandwidth. Sometimes, tampering and hacking of a district server can be the cause. Teacher 14 explains:

Last year, somebody—I don't know how they did this. Somebody in the high school....they, um....I hope they got....they must've gotten expelled. But, no, they were messing with the....with the Internet." [When asked who was tampering, she answers:] "A high-school student. I don't know who it was. Maybe it was two. I don't remember. No-one could act—use the Internet for, like, two weeks. I don't know how tech—I don't know. We couldn't use the Internet. It was ridiculous because of some high-school student...they hacked it.

Ultimately, this act of tampering impacted not only her classroom and the classrooms of every teacher in her school, but across four schools within her district.

Another teacher (#5) recounted dealing with a blown transformer, which, again, brought instruction to a halt. As such, she does not rely exclusively on the resources allotted to her.

Such experiences appear to have made an impact on her perceived value beliefs of educational technology.

We've been in situations...where we lost power because a transformer blew. So...I don't think you can rely a hundred percent on technology on teaching the kids. You're still teaching the kids. The technology is helping you or the technology is a resource, but, you know, you still need to have your own set of teaching skills. The technology can't replace that.

Teacher 10 shares a similar sentiment:

It is a great tool to have. It is a great tool. Um, would I put all of my eggs in that basket? No. But it is something where, if I have a dozen eggs, I'll put like three or four in that basket because it is a tool to be used. It's not something that's the end all, be all of what I teach or how I teach, but it's a nice accessory.

Referring to what teacher 10 mentioned about video games being a tool—like any tool, care should be taken. If one wants it to be functional and serve the owner into the future, you sharpen the blade, you check the oil of the lawnmower, you change the chain of the chainsaw. Similarly, if one wants to use video games with a group of students, a teacher needs to ensure the pieces work correctly.

Thus far, the teacher stories have detailed the distribution of resources and the school practice of sharing carts. They have also touched on the reliability of the Internet, strained bandwidth, and concerns about hacking of the school servers or being cut-off unexpectedly. Likewise, themes of money have been briefly touched upon. Budget is a chief constraint, as it relates to the allocation / lifespan of devices, as well as the limitations of school resources and internet reliability. Primarily, cost as it relates to the subscriptions and licenses for games and digital content, as well as the expense of servicing and maintenance of school equipment.

Teacher #12 had this to say about her school paying for a license for Study Island. She says, "I can recognize what's going to work and so many times people can't. [chuckles] They [the school] waste money on stuff and it's like, "Oh, my God!" We have to pay for a license—not this...this is free. Okay? I have to pay for a Study Island license. It's about \$9 dollars per child." When asked who pays for this, she adds, "The school does, but I had to convince them to." Again, she emphasizes, \$9.00 "Per license. Per student. Per year." The student enrollment at her current school is 1,322 as of 2018. At \$9.00 per student for just Study Island, that averages to \$11,898 a year, which Teacher 12 concedes, "That's not small potatoes." Of course,

it should be noted that her district is a district of 1 school, which makes things slightly more manageable compared to the likes of a district, such as Cherry Hill, NJ. One such representative from Cherry Hill, Teacher 1, discusses her struggle to finance educational games:

Some of them are subscription based and we don't have the money. And the district...this district being so large...sometimes it makes it harder for them to get funding because, um, first of all, this is a Title One school, but Cherry Hill is viewed as an affluent district...so if it's specifically—should we give this grant to Cherry Hill, um, you know...you know, really Cherry Hill shouldn't need that money. So that's number one. Number two: because *there are 12 elementary schools*, you can't just go to the district and say "hey...can I get money for such stuff?" because you're not going to do it for one school...so let's say—whatever—a thousand dollars. Where we say "sure, we can afford a thousand dollars, but we can't afford twelve thousand dollars", so it is harder.

As teacher #1 describes, sometimes funds are not readily available. Other times, it's a matter of allocating resources across the span of multiple schools. She makes a valid point that it's easy to allocate money for one school, but it becomes a great deal more challenging when considering a network of schools within the same district. Due to this, teachers have to do without, adapt, and evolve. Teachers confessed they would like to use more video games, but they are hindered by computers that can't support the types of games desired. This is largely why every teacher I spoke with use educational video games that are hosted online. For example, teacher #2 notes:

Most video games I can get 'cause *most of them are web-based*. So, most of the time, it doesn't matter if I'm using a chromebook, um, or a PC, but there are some, like, bigger games. I don't feel, like, I could even dive into the realm of trying to use Minecraft in the classroom with Chrome Books. *I don't have the computing power*. I don't have the bandwidth to do it all online. Ya know what I mean? So, I don't... I haven't tried Minecraft. Although I've heard it being touted as this great thing.

If computing power isn't an issue, sometimes the very rooms one teaches in are at risk of being lost. Teacher #15 shared her experience of being evicted by the administration and forced to

move into another classroom entirely—one that did not have the same host of equipment that she was accustomed to. Originally, her classroom was equipped with a smartboard and a projector. She describes her experience saying, "I had a smartboard where the kids can go up and interact on it and, then, they switched me to over here. [laughs] And they gave me this computer where my computer screen doesn't turn and I can't touch the screen and they're like, "Are you okay with that?" I'm like, "Well...what am I...what do you want me to do? I mean, I'll figure it out. Like, whadda ya...?" She continues, stating, "I'm walking around. And I'm walking around with this big clunker of a computer. That computer *was* really nice because, um...but, now, it has to be tethered to a cable. [laughs]" Here, she refers to her classroom equipment in past tense—the computer was nice... she had a smartboard. In some schools, teachers have carts that move from room to room. In the case of Teacher 15, the school opted to move the teachers from room to room. Additionally, in this case, not every room is equipped with the same caliber of technology that a teacher may be accustomed to. Ironically, after this room switch, Teacher #15 comments about the teacher who took over her classroom. This is how the story concludes:

Meanwhile, this poor guy over here who's, like, 70...they gave him the smartboard and he turned all his chairs. The smartboard's right there. He turned all his chairs this way. [laughs] So, the kids won't even look at the smartboard and know that it's there. So, he just teaches on his chalkboard. And he's a great guy and his scores are amongst the best in the district. Like, he's amazingly bright, but he's..."I think I'm gonna move my desks." I'm like, "You do that!" [laughs]

This was an interesting turn of events. It is unknown why a room that was equipped with the tools and a teacher who was using them ended up with a roster switch with a teacher who does not use the equipment whatsoever. Nevertheless, these are the types of stories that sharpen the picture of the lived experiences of teachers, today.

A final point, as it relates to the limitations of school resources relates to the online nature of the educational video games these teachers use—namely, the fact that the delivery of content is not fully reliable. This includes elements, such as content no longer being made available, becoming outdated, changing in some form, disappearing entirely, or suddenly becoming a 'for-profit' service that requires paying for a license. As it pertains to content disappearing, Teacher 2 shares such a story,

We used to have a great building game called, uh..."Build With Chrome"....It was legos and you could build stuff online. *They took it down last year.* I was, like, "damn." My kids used it for the last two years. Of course, this year, when I think it would've really benefited these kids that I see now...but, of course, *now it's gone.*

Other times, content changes without notice. Teacher 12 recounts her experience with a program she uses in her classroom called Study Island. "They've changed—this (Study Island)...it just changed about a month ago, *which drives me crazy that all of a sudden, something that I'm really familiar with, has changed.*" Ironically, the district had employed a recent workshop on Study Island not long between said change. She adds, "We just had a Study Island training, again, last year, which surprises me that the website design has changed in the last month. 'Cause we just had somebody out, last year, showing us all about the green apples and they, apparently, are gone. \*laughs\*"

Lastly, there are hiccups, as it relates to the updating of resources on school computers. Due to the protection policies in place by a school's technology department, incidents arise where a teacher's computer may be missing an update. For example, an outdated version of Adobe Flash or Java, which interferes with one's ability to demonstrate a video game on their device. Teacher 13 recounts, "A lot of times, my computer won't run it because I don't have the current Flash, but the kids' computers will run it." Other times, the technical issue is on the



student side and the school Technology Department is slow to respond. Teacher 14 described her frustrations: "I can think of, like, three (students) off the top of my head who needed to get their passwords reset—and it's not that immediate, which is really annoying, too. But.... the one girl, it took, like, two weeks for her password to get reset." She tries to explain the delay, stating, "I don't know what was happening with our tech department. So, they lost somebody and, then, it was, like, a few weeks period that—I don't know what was happening, but nothing....well, nothing was happening is what was happening." In these scenarios, again, teachers are at the mercy of the unexpected. These latter examples also eat up precious time, which is the topic of the next theme. With that, let us explore Theme #2.

## **Theme 2: The Struggle for Time**

Time management is a critical component of being an effective educator. For a teacher who uses educational video games, it's all the more important. Fittingly, the second theme that arose during my interviews with teachers dealt with a group-wide consensus that there is not enough time in a day—especially when video games are in play. Lack of time is a broad topic. However, there are specific sub-categories that were revealed during analysis. They include: (a) time to design/plan; (b) time to set-up and troubleshoot; and (c) time to implement. As teacher 1 clearly points out, "We don't—unfortunately, in our schedule, we don't have enough time in the day."

As it relates to the time requirement for designing and developing, one teacher stood out amongst the rest. This was Teacher 11, a Math teacher at Rosa International Middle School. She uses Kahoot, which is fairly easy to modify after pulling from a database of pre-generated sessions. The other game is one of preference by Teacher 11 and requires a great deal more time and effort to develop—these are games hosted on the Smart Board. Although the literature

review did not delve into the realm of teacher-created content, it is a facet of this particular teacher's life world. She states the following:

It's a lot of work to make the games. Like the....the smartboard games. They can take hours to make, so if you're not teaching the same thing year after year. Like I'm makin—I gotta make one today for my kids tomorrow, but, like, sometimes [other teachers] say, "Oh, can you make one?" I'm like, "Well, yeah, but it's gonna take me a while." Like, it's not that easy. Y'know? So, um...but, uh...I mean it's hard.

She acknowledged that she uses templates, but it still requires a great deal of investment off the clock, working from home. In addition to this, she also explains that her school will change-up the grades that she teaches and, as a result, requires editing these Smart Board games to suit each grade. She elaborates:

I mean, if I use Kahoot, they don't take a lot of time. That can be a really quick way for me to, like, "Oh, I have nothing to do. I'll play Kahoot today." That could be...that could be easy. Yeah. As long as the kids have their own devices with them. But, if I do...if I do a video game—like, one that I create...that can be a lot of work. So I guess it depends on the...on the game. This year, I teach 7th grade ITF and 6th grade. Last year, I taught 7th enriched and 8th grade ITF. And, then, the curriculum changes, so I have to change my game. So I do use games from year to year, but, then, they're....I have to revise and revamp them, too. Based on whatever they decide to change on me

As a means of combating the time crunch, Teacher 11 describes one way in which she attempts to bridge the gap by collaborating with fellow math teachers:

I'm working with 3 other teachers and we all work together, so we make decisions together, so things may have to get altered based on that. So I do go back. We do go back. We pull our old quizzes. We pull our old things and I use that, but, then, I have to find all that and, then, revamp all that.

This last piece of her story reveals that it requires time to find documents. It requires time to meet with colleagues. It requires time to revise.

This next report comes from Teacher 13 and focuses on planning and troubleshooting.

He describes his loss of time as "wrinkles" in the following scenario:

Another wrinkle that we get is that I have a different level of clearance than the students, so something like—like, I'll go on, I'll make sure that the site's working....uh, kind of, y'know, play it for a second...make sure everything's cool and I put all the activities up there and, *then, they get on and they're blocked...*and it's like, *I'm banging my head to the walls. I'm like, well since...so now I gotta go back.* Now, the advantage of having everyone on the Chromebook is, "Alright. Give me a minute. I'll go find something else" and, then update the post and, then, they're fine, but, y'know, that is another wrinkle, too. Or year by year, stuff that we used to be able to get access to is blocked and the problem is with the...if something's blocked, there's a process you have to go through to get it approved and, well, *I'm in the middle of class. Like, I don't have time to...*

In this case, the school security policies to prevent students from accessing inappropriate websites can cause challenges for teachers. The monitoring tools work too well and end up blocking digital content, like online educational video games, that a teacher intends to use in conjunction with their lesson. Again, this was a recurring theme that bubbled to the surface on multiple occasions during data collection. The teacher further explores his thoughts on this subject. He continues, stating:

Give me the same as the students—same restrictions as them. Basically, y'know, I want whatever I'm shooting out, I want it to be able to work. But, y'know, these...these are things, y'know, in the technology age that happens. You spend all this time prepping it and it...it does take a long time, uh, initially to really put a lot of the stuff together and, then, half of it's not working because it's blocked. Y'know, you're like, "Oh God. C'mon, man!"

This is not an isolated incident, as other stories of lost time due to trouble-shooting in the middle of instruction arise. These are the critical moments that many teachers dread. Teacher 14, for example, describes a time deficit as it relates to a district-mandated platform called Skills Navigator.

Because I got a whole class of kids...if they finish and—so, Skills Navigator, I have to hit refresh. It won't just \*snaps finger\* tell me. It won't refresh itself. And, so, then, if I have all these kids who finish their resources all at the same time, I need to go in and assign them the next thing. But, like, I need to choose it. Like, it needs to load. I choose it. I'm stuck at my desk.

In the case of Teacher 14, she is unable to work one-on-one with students because she is forced to work from her desk scheduling the next assignment. With Teacher 12, a different type of design flaw eats up her class time. Teacher #12 employs a different district-mandated platform called Study Island. In this case, the design element that hindering this teacher is the automatic logging out of the software after a brief idle time.

Oh, they shut me out. Hold on. It won't take long. Study [Island]...It happens to me all the time up at the Promethean board. I don't hear them complaining about it so much. *I'm the one that's constantly like, "Are you kidding me?"* I go up, I'm right in the middle of something...I take a second and, like, I can write on it when it's on the board. I can write on it with my pen, so I'm up there, like, demonstrating something and, then, I go to touch it and I'm timed out. *Annoys the HECK out of me.*

Regardless of the subject that one teaches, if there is a lapse of time due to technical difficulties, a window opens whereby a teacher risks losing student attention, instructional goals may not be met, or the pace of the day being thrown off. Teacher 4 shares his opinion on the topic:

You can't account for errors. And sometimes they're errors that might lead to a delay and, uh, one thing that—if you're a teacher, one thing you notice in the classroom is once there's a break in sequence, then there might be a chain reaction whereby the whole day just drags back a little bit. So, there is...sometimes that...like a chain reaction where one thing goes wrong and then, like, you know, it

might just, like—you...if you're not good at bouncing back up and, like, using something else that kind of, like, kill that time...yeah...a transition might have been an issue.

Teacher #2 offers his own insights into issues caused by holes in the class time. He recognizes that when his attention is divided by a technical issue when trying to implement an educational video game, for example, the moment creates a window for kids to become disengaged and *more time* is lost trying to reel their focus back in. He states, "Um, kids need to get themselves started right away—RIGHT away. If they're not started right away, their entire class is done and *this happens to me several times a week* where, just because something gets my attention, I turn away and then that's the end of the class, before it's even started so..." As a means of streamlining the flow of the lesson, Teacher #2 preemptively sets the tone of the class and attempts to avoid technical difficulties from interfering with the pace of instruction.

Similar to the insights from Teacher #2, distractions are a concern for Teacher #4, as well. Referring to his Kindergarten class, he speaks of time management and classroom management hand-in-hand. This is what he says,

Improper implementation of the tablets in the classroom could lead to a lot of, like, improper time management, um, *throw the classroom off*. It could be...it could be—rather than a tool, it could be a distraction. So you have to, in a sense, you know, be critical and, um, have...have it in an orderly fashion. That way it's not a distraction in the classroom.

The importance of proper utilization and staying on-task is a posture that is shared by all of these game-using teachers.

The final consideration professed by teachers relates to the structure of the school day and how it plays into video game usage. Once again, I refer to Teacher 2, who explains, "We only have 45 minutes together. That's not enough time to actually go through everything that I need to go through today, so I need you to stop and I need you to sit down and let's get started."

Across the spectrum of interviews, the time of classes range from 45 minutes to 84 minutes, depending on the district.

Teachers are trying to shave minutes where available. As such, Teacher #4 has made the following adjustment:

There's been times in the past where I started off with one of the Kahoot examples. I will show them this video: what it's going to be like so that they know. And, then, I'll express that I would really like for us to *keep our voices down*. It's not fair *because we only have a certain amount of time* so, I can't stop to give you the chance to applaud and cheer, so we have to control ourselves and keep it a little bit small scale.

With Teacher 4, managing student behavior during game-play is a factor for her. Again, classroom management and time management appear to come hand-in hand in this scenario. Based on this interpretation, her class misses out on the joys of game play—the laughter, the applause, and the revelry. It's a compromise that is made largely due to time being a factor in her classroom.

Contending with a crunched schedule was unanimously shared. Often, there is a set time limit and it does not change. Sometimes, however, time is actually taken away from a teacher's schedule. Take Teacher #12, for example. Two years ago, a new administrator made changes to her schedule, which has dramatically altered her ability to include game-play in her instruction. Traditionally, she would regularly play Kahoot, as well as a game that promotes problem solving and critical thinking—Lure of the Labyrinth. This is what she had to share, "Last year, they changed the timing of my 8th grade class. It went from being 90 minutes to only 60. So you'd say, 'Oh. 30 minutes less.' *Well, that's 2 and half hours a week*. And, for the first time in a long time, I had a student fail the Keystone. *And I blame the schedule*." She elaborates in detail how this schedule change has impacted her and her peers:

The 90 minutes let for a lot of hands-on activity. Uh, a lot of tech-work. A lot of group work. The 90 minutes, it wasn't all just you standing up there throwing spaghetti at the wall and hoping it stuck. You had a lot of time. You could do a lot of different things. When they cut it down by 30 minutes a day, none of us even know how to get the curriculum in there. We were so used—like 10 years worth of 90 minutes a day. Y'know, the Science could do a lot of labs, the English could do a lot of writing. Every subject was cut down. Every single subject was cut down.

Because we had 90 minutes a day back then and we built it (Lure of the Labyrinth) into our curriculum. I have not instituted it yet in my classroom this year because of the new schedule. Uh, I'm still playing around with the new schedule because they actually took 45 minutes away from me—even more than what I had last year. So I'm really struggling.

Teacher #12 stresses the impact this change has made. To drill the point home, a final quote: "I just don't have enough minutes in the day to successfully—to get through the content and include a game every day. Maybe...twice a week, maybe." Ultimately, she turns to Study Island, another drill and practice game that entails a series of practice questions and, upon inputting the correct answer, rewards the student with a short game to play. Because of the loss of class time, Teacher #12 has adapted by using Study Island as a homework assignment..

The examples included here paint a vivid picture of the teacher lifeworld—teachers who use video games face a variety of time-related obstacles. They require flexibility and diligence to coordinate effectively.

### **Theme 3: Video Games Disrupting the Managed Classroom.**

The final theme that emerged is that of classroom management. Again, this is a broad topic, but key points include behavior management, bullying, hogging of technology, and students being off-task. Interviews also brought to light topics, such as sore losers, poor sportsmanship, and the destruction of classroom equipment. Some of the participants describe themselves as 'non-traditional' instructors, whereas others describe their classroom atmosphere as

a "flipped classroom" or game-based activities as "organized chaos". The stories that follow detail students conducting themselves in ways that are not always acceptable according to the teachers.

As mentioned previously, the majority of participants teach in schools where students have 1:1 devices. According to the teachers, it's extremely convenient—especially when facilitating a Kahoot or Quizlet session. However, it was also communicated to me that 1:1 devices are somewhat of a double-edged sword. A critical item that teachers brought up was the fact that student-operated devices require regulation, lest they find their students using the tools to access unwanted content, which includes unregulated web-based games and online streaming sites, such as Youtube. On more than one occasion, teachers communicate their fears of students going off-task. A recurring word used by Teacher #10 is "nervous"—a term often accompanied by concerns related to off-task behavior. This is one excerpt that reflects this:

I am never intimidated when a student knows more than me. I will be the first one to say, "that was a great idea that I never thought of." That doesn't bother me, but, again, *when it's my professionalism and my job on the line...if a student is bullying some other student during class and I'm not picking up on it because I'm not walking around monitoring or I'm not aware of how to monitor the problem, that's what make me nervous.*

One measure of countering this is employing care, diligence, and a keen eye, which Teacher #4 recognizes as a vital component of classroom management. The following is an excerpt of his experiences—what he has learned as it relates to student exploits on their tablets:

During the school day. Kids...if..if...if you're not careful, they'll go on different—they have their own gaming websites that they go on and they play on while they're at home and they try, in a sense, uh,[to] get this done during school time.

There are only so many degrees of vigilance a teacher can employ in the moment. Sometimes, teachers need to act preemptively and employ measures to thwart unwanted occurrences before



they can happen. Teacher #2 employs such measures, which he has to do to keep students focused and on track in his Technology class. He states,

I spend...I would say I spend a solid hour a week—doesn't sound like a lot, but an hour blocking websites. An hour easy, every week, because the kids have found another way around to get to some inappropriate website \*chuckles\* that are just games.

Although Teacher #2 has the ability to control the content in his classroom, in other schools, the onus of moderation falls on the school technology department. Teacher #10, also, has observed students accessing content at inappropriate times, but the website, itself, is contested depending on which teacher you speak to. As such, it's a delicate balancing act on the part of the technology department. He says,

Um, mathgames.com...I haven't been onto that website. Mainly because, um, it was blocked and, then, it was unblocked because the kids were playing it at inappropriate...like inappropriate times—like, during English or something like that, so, y'know...yeah. It's...apparently they're very interesting. There's some teachers that want that website—I think it's mathgames.com—that want it blocked so that the kids can't go on it during their class.

Reflecting on this story, he cites the website being blocked and unblocked, which suggests inconsistency as it relates to restricting content within his school. It appears to be a subjective decision depending upon who is making the request and who is honoring the changes. He later concedes that the school transitioned to equipping each teacher with monitoring software—a compromise proposed by the administration. One such tool is Go Guardian. Teacher #10 explains, "We have this thing called Go Guardian where you can actually block websites while the kids are in your room. You can have them only go on a certain website while they're in there, so that was kind-of the happy medium."

This section now shifts from experiences related to student distractions and transitions to issues that arise as a result of engaging in the act of game-play. As mentioned earlier, games

like Kahoot and Quizlet are highly competitive. When things get competitive and there is an observable score board that showcases top performers and low performers, emotions can run high. As such, these teachers brought to light some thoughts and concerns related to this topic.

Teacher 7 had this to say, "I teach 3 classes a day. 3 different classes a day. If, for some reason, y'know, *behaviorally*, I didn't think the kids could handle—whether it was the competition or things like that—that's the only thing that really deters you from it [using video games]" Teacher 8, who is a high-school football coach and a middle-school basketball coach after school, has had his share of experiences with kids that struggle with competition. This is one such observation, as it relates to competitive gaming (Kahoot) in his classroom. He says:

They [the students]...they're very competitive in the beginning. Um...you know...there are some...who wanna quit because they see they're not in the top 5 and they don't wanna do it. And I stop the game and correct them. It's not about [losing]...you know? You can't quit because things aren't going your way. You gotta still try...so, uh, most of the time, they get back in it and, then, they'll see themselves climbing up the ranks and [keep playing].

Note, he uses the term "most of the time". As it relates to the other times, he concedes he has a somewhat trickier time re-engaging a student. Yet again, there is bleeding over of themes, with what he discusses in the next excerpt. Teacher #8 acknowledges that reclaiming the heart and mind of a student that is disengaged takes time.

If they're playing a game and they notice they're not there—they're losing—they're not in the top 5—they just, "I'm not going to do this" and they just stop. And you say, "Well, you can't quit. You gotta finish the game" and they don't want to—so those are the ones harder to reach because you're still in the middle of the game with the other 14 or 15 students. So...instead of being able to pull them to the side and talk to them and try to bring them back right away...you know...I can re—redirect them a different way later on, but right at that...at that point when everyone else is into the game playing...it's hard to stop and...and focus on the ones that just don't want to do it.

Reflecting further on this story, there is another element at play. The student in Teacher #8's story doesn't want to play because they're not performing well. Sometimes, a game can be too difficult for a student. When a video game is too difficult, some students—particularly, those who may have emotional problems or special needs in the classroom—may get overly frustrated and cause damage to the school-provided devices. Teacher #9 has had such experiences with both Kindergarteners, as well as 5th graders. She says, "The only other time it can be an issue is when you have students with behaviors who...get frustrated—they can break it. I had it happen...taken an I-pad and thrown it across the room and it shattered into a thousand pieces."

At this juncture, it should be noted that other points that arose from these interviews included themes related to cognitive load theory, motivation, and burn-out.

Teacher #2 shares his opinion of game design, stating, "It can't be, like, so vanilla that they don't want to do it, but, also, it can't be so complex that I don't feel motivated to even get to the next part because it feels so impossible." Teacher #11 has this to say, " I...believe that they....that they should be challenged. That you should raise the bar. That....that you shouldn't lower expectations that kids... if you set your expectations down here, they're only going to work down here." She continues, saying:

Harvard's not looking at their 7th grade Math scores. Y'know, if they're going to mess up....if they're—if they've never studied in their life and they're not used to getting grades and they don't know how to do certain things, they're going to mess up and make the mistakes. They should make 'em then.... So if you lower your expectations....when they get to high school, then, they're gonna....they're gonna flounder there and that...that counts.

Although arguments, outbursts, and poor sportsmanship are behavioral issues these teachers report, there is another, less documented issue that warrants addressing. As noted, games like Kahoot, Quizlet, and Reflex Math are speed-driven educational video games.

Students are trying to be the fastest, climb the leader board, and keep inputting answers—sometimes at the expense of not stopping and thinking critically about the answer. It should be noted that this was a theme that appeared across all grades, Kindergarten through 8th grade. Teacher #8 provides some exposition of this facet, which I refer to as "No time to think! Full speed ahead!" He says, "Do they actually know it or are they just pushing random buttons to try and get the highest score? ...the competitive nature of the student kicks in." Teacher #1 shared a similar insight. She says,

The quicker you are, the more points you get, *so they don't wanna talk about it because they just want to give an answer.* So, it's exactly like that scoring wise. So even if 10 people get it right, the person who got it right first gets the most points. So the—competition is everything in 4th grade—in most of the grades. I'd say starting in 3rd...and they're not competitive about what percentage the, um, proficient they are or how fluent they are in their facts. *They are competitive about the score they get in a game.* So, I need that to turn around.

Referring, once more, to Teacher #7, she offers the following insight:

So there was a lot of shouting and whooping and hollering and oh they were excited...You had to learn how to, like I said, make sure the kids understood that 'yeah, it's fun but it's for the math.' *It's fun, but are you learning?* Because that's what happened initially. They would play a game. *They had no idea why they played it. They had no idea what they were supposed to learn.*

Anytime you use a game whether it's a video game...any game in a classroom..if you don't frame it, if you don't set the stage for the students it can easily go awry. Easily. Because they are kids and they go back to *they just want to win, they just want to win at all costs, they don't care.* You know. So if you don't keep them focused or even sometimes you pause it in the middle or there's times when I've had to end it—end a game because we're not getting out of it what I wanted you to get out of it so we're going to stop this and we're going to go to this and they go "ohhhhh" but if you can't tell me why we're doing it then it loses the purpose.

Teacher #2 adds, "They really don't care about the basics. They really don't care about the basics. they want to have the end. They want to be able to just go ahead and play." Meanwhile, Teacher #1 adds, "The process is key. And, in video games, it's always the answer, which it HAS to be. It's a computer." A similar tone, as it relates to the kids wanting the answer, deals with teachers observing their kids using their 1:1 devices to cheat—to jump to the answer without grasping the concept...*without earning their learning*. This can either be in the form of abusing the chat features on the Chromebooks or simply searching for the answer in their device's web browser. Teacher #12 shares this story, as it relates to using a game called Lure of the Labyrinth, which promotes critical thinking skills and doesn't hold their hands:

Free thinking. Independent free thinking. When I say to them, "I am not on your team. I am not helping you." I mean it. The video games are like that too and they get involved in the Lure of the Labyrinth and they get to a point where they're stuck. I...uh...know what they do now. *Those little cheaters. They cheat. You can go onto the Internet and find ways around these. They...they cheat.*

Teacher #10 also comments on the risk of cheating with her group of students. She says, "Y'know, when they're on their chromebooks...I make them flip their desks around." She adds, "I'm like, "Turn your desks around so I can see the back of your screen." Like, *it does make me very nervous...*y'know, with Google, they're able to do Google Chat with each-other." In this situation, not only does Teacher #10 make her students rotate their seats, but she also makes a point to personally monitor student screens to further prevent acts of deceitfulness.

Transitioning, slightly, once more, the theme now shifts to video game burn-out. In the accounts related to this topic, it is acknowledged that too much of a particular approach, whether digital or non-digital can result in student apathy. Again, this is a topic that shares somewhat similar roots with earlier stories of distractions and the accessing unwanted content. In this case, the theme relates to over-use of video games and how it adversely affects learner attention spans.

I refer to Teacher #10, who explains that there are educational video games that she is required to use on a regular basis. Being *required* by a school to use a particular game lead to several reports by teachers of students losing motivation and becoming burned out. One platform, Study Island, is a district-wide MANDATED platform that is tied to Pennsylvania State Tests. This is mentioned by all of the teachers from PA that I spoke with--especially Teacher 10. She cites, "the kids are like, "I don't wanna look at a computer screen anymore."

As a result, she is more inclined to limit the usage of study island—employing moderation. "I think that there needs to be some type of balance between the two." She adds:

*The more often you use it, the more numb they are to it. So, the....if you use it too much, then, it...it no longer interests them.* Much like the chromebooks—like, if you were to ask some of my students, they would probably say that. They have said that, you know, it's too much. Like people are using them in all the classes. They just want to write things on paper and pencils sometimes...So there needs to be a fine line between how often they're used because they do get burned out.

In this case, she uses the term "numb" to describe their interest level. Boredom is something teachers acknowledge as it relates to student behavior. however, this is due to lack of variety and repetition of the same games over and over again. Teacher #10 stresses that Study Island is used in Pennsylvania from very early Elementary level all the way through High School. "Some of them have been using it since elementary school, *so this has really been a burn-out for some of them.*", she says. She describes students rolling their eyes at the utterance of Study Island. Here is that story:

Yeah. I'll say, "Oh, Study Island". They're like \*rolls eyes\*. \*chuckles\* Whereas, when it first came out...yeah. When it first came out, they were, like, excited 'cause it's something different. Anytime it's something different. Any new evolution, they'll be excited about it at first, but, unfortunately, y'know, Study Island may change the games a little bit, but the whole base of Study Island is still the same, where they still have to do the problem.

Teacher #12, the other educator that teaches in PA, expresses an almost identical response from her students. She states, " They hate Study Island 'cause it's so skill driven. Oh, the hate it. It's hard. It's hard. It's very hard. It..it..it's....y'know, they cry when I give them Study Island. Oh, [imitating students] "*Ohhhh. Not Study Island*" Yep. They cry about it...Study Island brings about 6 concepts into one lesson and it's too—they cry." Referring back to the culture of immediate gratification, Study Island denies the reward because, as Teacher #12 adds, "Study Island, you don't get to play the game until you get something right."

To conclude, these teachers are versed in a variety of classroom management, engagement and motivational techniques, and prepared to expect the unexpected. When digital educational games are in play, a teacher cannot sit back and let things unfold—it requires preparation for anything. However, when employed correctly, these teachers all acknowledge value in video games as a tool to use in their toolboxes.

## *Chapter 5 – General Discussions and Implications*

Research Question: What are the experiences of teachers who use educational video games in their classrooms?

In this final segment, I discuss my findings as it relates to my research question: “What are the experiences of teachers who use educational video games in their classrooms?” Akin to other qualitative studies, this research was host to a wealth of thick, rich descriptions open to interpretation. In the previous chapter, I sought to paint an accurate portrayal of the teacher lifeworld—of their shared experiences using educational video games. Additionally, I identified emergent themes that spanned these experiences. In this chapter, I will touch on major findings, as well as discuss future research possibilities following this study.

### *Summary and Discussion Pertaining to the Research Question*

The research question aimed to explore K-8 public school teacher experiences using educational video games in the classroom—their opinions, observations, and stories about how their attitudes have been shaped by the active use of video games in their classroom instruction. This study confirmed findings by Rosas et al. (2004), in regards to teachers forming a positive posture towards video games after being exposed to the medium. Unlike the Rosas study, where groups of teachers were trained in an experimental video game of the researchers' design, the current study collected the opinions of teachers who actively engage in recurring video game use of their own choice without outside interference.

Findings also supported the work of Zhao and Frank (2003) in regards to the correlation between teacher proficiency with technology—in this case, educational video games—and positive value beliefs in relation to video games. One additional finding—a possible link between a teacher's mastery of the subject in conjunction with technology adeptness and the



shaping of favorable attitudes towards video games. This study revealed that teachers design instruction that plays to their strengths, connecting their mastery of the subject to the technology. Based on these interviews, the teachers who identified themselves as masters of both the subject matter and the educational gaming tools perceived themselves more effective compared to their non-game using peers. They communicated feeling more effective as educators, facilitators, and video game selectors.

Another finding suggests that, although these teachers maintained positive value beliefs, they did not completely buy into the reliability or effectiveness of educational video games (Ito, 2008). The video game medium these teachers describe is engaging, but lacking in the ability to elicit critical thinking skills and deep reasoning skills. In addition, many found value in their use, but conceded that they should be used in moderation—many referring to them as just one 'tool' in their 'tool-box' of educational instruments.

### ***The Interplay Between Educational Video Games and Teacher Lifeworlds***

The findings confirmed that teachers are using drill and practice (Jonassen, 1988) and short simple games (Advertainment & Rise, 2016) as the primary game-based instructional tool. According to the participant pool, the top three digital games used in the classroom were Kahoot, IXL, and Quizlet. Other games mentioned, included ABCya, Study Island, and The Lure of the Labyrinth—the latter being the most different in presentation and play style. Additionally, although IXL was reported as a game by the teachers, it is akin to a digital worksheet with rewards in the form of digital stickers. The interviews confirmed that the act of repetition while engaging in these game-based activities are promoting memorization and retention (Becker, 2017; Reigeluth, 1999).

The following themes emerged from the interviews—primarily as they relate to challenges and limitations of implementing video games: 1.) Allocation and Lifespan of Devices, Limitations of Resources, and Lack of Funding; 2.) The Struggle for Time; and 3.) Video Games Disrupting the Managed Classroom. Many of these are pragmatic in nature and are among documented issues that have similarly impacted non-game using teachers (Bingimlas, 2009; Sugar, Crawley, & Fine, 2004).

As supported by Ertmer (2010), teachers face an uphill battle for resources. In terms of this pool of teachers, 70% reported using Google Chromebooks, district provided laptops that serve as 1:1 devices to their students. The remaining 30% of teachers acknowledged having to rely on the scheduling and renting of tech carts, which can interfere with their plans to implement video games according to their timetable. Similarly, equipment can become old or outdated and the likelihood of receiving new or replacement technology is low, as reported by the teachers, which also poses challenges. These reports align with the Thomas, O’Bannon and Bolton study (2013), which examined perceived barriers of M-learning by a sample of 101 teachers—equipment costs being among the most noteworthy considerations reported.

Alternately, unlike the sharing of devices, which can be managed via scheduling and peer collaboration (Cellante, Mishra, Campbell, Hansen, & Buxton, 2017), teachers reported that their respective schools had limited Internet bandwidth shared with the entire school at all times during the school day. For teachers who use online supported educational video games, this puts a strain on the ability to deliver dependable gaming experiences in their classrooms (Armstrong, 2014). This can also result in interruptions in connection, slower bandwidth speeds, and the unpredictability of server crashes (Summers, Zadrozny, Van Overschelde, Huynh, Solem, & Boehm, 2017).

Another unpredictable factor that arose during interviews was the tampering / hacking of school servers (Goran, 2017) with reports of foreign parties, such as high-school students, changing a district's password and bringing multiple schools to a complete halt for up to two weeks.

Consistent with other research (Tabo, Capraro, & Yalvac, 2017), the lack of funding to pay for licenses and subscriptions for online gaming services proved to be another point of contention among participants. Many teachers conceded that they attempted, unsuccessfully, to appeal to the school administration for financial backing, while others were forced to pay out of their own pockets to get the features they sought. Most often reported is teachers opting to use free gaming websites. The downside being unwanted advertisements and the risk of unwanted content abruptly popping up on student screens. Teacher #3 bridged the funding gap by employing crowd-funding sites, such as DonorsChoose.org and GoFundMe to get the equipment that is lacking in her classroom environment.

Another element that resulted in frustrations among many teachers was insufficient time in the school day—especially when video games were in play. Specific sub-categories revealed during analysis included: 1.) time to design / plan, 2.) time to set-up and troubleshoot, and 3.) time to implement. As it relates to the design and planning phase, participants expressed using unpaid time after school, working, preparing, or retooling Kahoot, Quizlet, and Smartboard games from home. Furthermore, some teachers reported being transferred between grade levels during their tenure, which required the either the creation of entirely new or reworked content that adheres to the different State Standards.

Every second counts in a teacher's classroom and if a video game is to be properly utilized, the ideal scenario is that all equipment—student devices, the classroom projector, and other accessories—works as intended. This is not always the case, however, as was reported by

the participants. Consistent with a previous study by Kopcha (2012), troubleshooting hardware and technical glitches are relevant performance gaps, as well as the blocking of content by school network servers. This traditionally requires reaching out to the school technical team to remove any blocks. Furthermore, this results in backpedaling with the planning phase, as more time is diverted to ensure the content will be accessible during class time.

Finally, there is the moment of game-play—the time during implementation. Consistent with findings by Baek (2008), teachers reported frustrations with condensed schedules and an overall time crunch that can loom over a lesson. As reported, the time of classes range from 45 minutes to 84 minutes, depending on the district. Teachers reported using educational video games on average 26 minutes, at least once a week. Teachers spend as little as fifteen minutes to as much as sixty minutes—the length of a class period, minus prep-time. Many of these teachers conceded that they feel there is not enough time to use video games as often as they would like. Additionally, when competitive games are in play, student behavioral problems can arise, which also interfere with the amount of game time a teacher may have initially planned for, which aligns with findings by Anand (2007).

Classroom management proved to be the final theme that presented itself—chiefly, the theme of video games disrupting the managed classroom, which is supported by Rice (2007). These included stories related to behavior management, bullying, hogging of technology, and students being off-task. The Interviews also brought to light topics, such as sore losers, poor sportsmanship, and the destruction of classroom equipment. With games that are competitive, there can be behavior problems, as explored in the stories the teachers shared. Likewise, the allure of video games for students can sometimes result in difficulties removing the games from the hands of students immersed in their gaming experiences.

### **Implications of Themes Pertaining to Learning, Design, and Technology**

Based on the results of the study, there are several conclusions that can be offered that inform the field of Instructional Systems / Learning, Design, and Technology. A prevalent theme relates to pedagogy. Again, the research question was: “What are the experiences of teachers who use educational video games in their classrooms?” In another light, the question can be interpreted as "How do educational video games influence the lifeworld of teachers?" There are different elements that make up this lifeworld. Teaching is multi-faceted, as expressed earlier in this body of work. Ultimately, I would contend that there are four key areas that make up the teacher lifeworld. These include 1.) teaching the material, 2.) motivating and engaging learners, 3.) classroom management, and 4.) assessment. So how are these video games influencing these aspects? The following sub-sections explore this.

### **Games as Drill and Practice Pedagogy**

A chief implication related to this study is that drill and practice, at least for these teachers, is good. At its core, the role of an educator is to serve as a facilitator, a shaper of minds, and a purveyor of knowledge. One could argue that video games fulfill similar roles, but in slightly different ways. There are a multitude of approaches to teaching . So how do these educational video games influence pedagogy?

The games brought up by participants are not-teacher centered—they are student focused. Most of these games align with behaviorist principals, such as answering 10 questions correctly to receive a reward. Video games are remarkable motivators with their 'carrot on a stick' approach. The teachers I interviewed brought up many examples, such as points, digital stickers, leader boards, etc.—the video game, itself, was sometimes the reward. These teachers

acknowledge that their students are extremely motivated by these digital exercises, despite the fact that many are similar to digital worksheets and rehearsed practice activities.

Referring, once again, to how this study informs pedagogy—aside from a rare few exceptions, the majority of game titles employed in the classroom fall into the drill and practice or short/simple game categories. Kahoot, Quizlet, Study Island, ABCya—these are all oriented around rote memorization via practice and a rinse-and-repeat method. The fact that they are on a digital platform allows for the randomization of questions and answers, which makes the experience less predictable for participants. However, these formats are formulaic in the sense that they still drill the knowledge into student brains through repetition.

On another note, it has been established that teachers classified IXL as a video game. However, its design is, perhaps, the farthest from that. IXL functions as a digital worksheet with digital stickers as rewards for the successful execution of a set number of problems. What is interesting is that these teachers think of these forms of computer-based drill and practice activities as educational video games. These teachers used descriptors such as "interactive", "colorful", "animated", and "engaging", when the activity itself may not differ much from solving questions in a paperbound practice book. It's the digital presentation of IXL that seems to make them consider it a video game. Nevertheless, both the IXL interface and the designated educational video games from Chapter 4 proved successful at eliciting learning and memorization by students. Ultimately, this leads into the next piece of commentary: do drill and practice have a place in schools?

### **Reconsidering Drill and Practice: Student Buy-In: Motivating and Engaging Learners**

During the interviews, many teachers expressed that they use these games because they are motivating to their students. The teachers are observing behavior on the part of the students

that is eliciting a positive attitude towards video games by both parties. Among the accounts shared by teachers, these included students asking to play IXL while listening to music, begging for more time in a game-based activity, or acknowledging having to struggle, as a teacher, at pulling engaged students away from their digital experiences.

I refer to Hill (2012), who states that key criteria for outstanding instruction include "high levels of engagement", "collaboration", "tasks [that] are challenging", and "activities [that] are imaginative" (Hill, 2012, p. 4). Drill and practice games could be considered the antithesis of such criteria, but the fact that teachers use them as their primary game-based classroom activities may suggest that they are not to be underestimated. Educational technologists believe that learning with technology can expand beyond the scope of simple games, but, perhaps these games are succeeding because they meet the differing goals of both teachers and students.

One could argue that the drill and practice design—as basic as it may be—is helping these teachers deliver instruction in a way that is more effective compared to employing traditional, alternative techniques. These types of video games are helping the kids sit down and practice activities over and over again, when they might normally give up. They're keeping kids engaged, which supports findings by Folkins et al (2016). During game-play, the learners are employing sustained concentration and on task behavior—persisting longer in activities that would, otherwise, yield mental fatigue (Beck & Wade, 2004).

### **Classroom Management**

These teachers are using video games to teach and to motivate, which supports the findings by Birk et al (2016). When students are motivated—whether intrinsically or extrinsically—this absorption in the activity creates an ideal atmosphere for learning to occur.

Additionally, depending on the type of gaming activity a teacher opts to incorporate, they are better able to predict the kinds of behavioral management issues that will likely arise.

As noted in Chapter 4, many of the class-wide games are heavily influenced by competition, which can disrupt the managed classroom. However, when students are engaged on a 1-to-1 device and participating in single-player activities, there is less likelihood for disturbances. Reflecting on my own experiences as a student teacher, I specifically recall moments when outbursts and management issues reared their head. One such example would be during quiet-time / practice-time, when students would be working in a traditional paper textbook with a pencil and eraser—during this type of scenario, there was an increased likelihood of boredom that would lead to disruptions.

It is the digital interface—the fact that the medium is screen driven—that teachers allude to making a difference. According to the opinions gathered from this study, the teachers believe that this generation of learners would rather be absorbed in the safe space of a tablet screen or a laptop than be lectured to by a human being. Several teachers conceded as well that they don't like lecturing and prefer the game-based activities.

### **Evaluation, Assessment, and Meeting Metrics**

Another characteristic that teachers acknowledged among favorable feedback about the games they use relates to the assessment aspect of game design (Shute & Rahimi, 2017). Unlike a pen and paper test assessment that requires personally reviewing each and every written assignment, after a Kahoot or Quizlet session, the statistics are immediately available for review. Teachers are able to easily pull up individual questions and see how each student performed across the board. The aspect of immediate feedback was a major selling point by every single participant interviewed. In this regard, the teachers could quickly determine where students



needed additional practice and dispense the appropriate intervention to bridge that performance gap. A common recollection by teachers was that it used to be far more difficult to attend to the needs of every single student. With the digital feedback immediately generated, this is now far less of a problem.

Referring back to the concept of students feeling safe behind a screen, teachers expressed value in the fact that video games provide feedback that is unique to the platform. They are working within their own sacred space—a magic circle (Huizinga, 1950; Salen & Zimmerman, 2004). If a mistake is made in a video game, a player can try again without severe repercussions and, as a result, find himself or herself in an environment ideally conducive to learning. This was an element that was observed by several teachers—upon engaging in a game-based activity, seeing students demonstrating a completely different side, performance-wise and personality-wise. In regards to accommodating various learning styles, video games are proving to hold a relevant place in these classrooms.

### **Other Considerations**

A final theme that plays a role in the attitudes of game-using teachers relates to the constraints of the school and district. These include financing for equipment and licenses, as well as the censorship and blocking of material deemed inappropriate for student viewing, which can interfere with the teacher's ability to deliver instruction. These limitations caused distress among the teachers—many feeling they could not make a significant impact on administrators to garner funding. As a result, they communicated a sort of acceptance of the things they believe cannot be changed. Teachers are using these types of games because that is all they can afford or have access to in their classrooms, given IT lockdowns and State Standards. As a result, these teachers are spending time during after-hours searching for free educational games or editing /

modifying Kahoot or Quizlet sessions, as those games are known to work in their classrooms. Reliability and dependability proved to be an overarching theme that came up multiple times across the span of interviews. Teachers need peace of mind that the lesson design they finalize will actually work as intended upon setting foot in the classroom.

### **Limitations and Implications for Future Research**

This study examined the lived experience of public school teachers (K-8) who use digital educational games in their classrooms. Early on, I was of the mindset that this study could include both commercial and educational video games. Ultimately, however, due to time constraints and the sheer volume of data that would result (as well as guidance from my committee), I opted to focus my study towards educational video games. The rationale being that if teachers are using video games in their classrooms, there would be a higher likelihood of experiences related to video games of the educational variety—this proved accurate in the cases explored in this study.

A personal consideration for future research would entail interviewing a larger pool of teachers as it pertains to the research question: what are the experiences of teachers who use educational video games in their classrooms? This study had its limitations, largely being localized within the footprint of South Jersey and Philadelphia, PA. Expanding the pool of participants across the expanse of the United States could uncover additional themes. A larger scale study, perhaps mixed methods, combining interview and survey data would merit pursuing. The findings of this study revealed that, among the participant pool, these teachers classified digital activities like IXL as a video game. Is this exclusive to this group or participants or does it branch outward across the expanse of America's schools? A larger-scale study that furthers the narrative of what teachers consider to be educational games would prove a worthwhile pursuit.

Another avenue is finding a different pool of teachers and speaking with them about using commercial, entertainment games complementary to their instruction. Such an endeavor would likely prove extremely challenging, as the sheer level of difficulty finding teachers who use video games of the educational variety posed an unexpected challenge for this study. As it relates to commercial games, Teacher #13 was the only participant who uses them with his instruction. He applies for grant money to afford up-to-date consoles and also spends money out of pocket to keep his game-based classroom up to date with the most recent gaming systems.

A final option for future research would involve conducting a case study, focusing specifically on Teacher #13. His style of teaching and the layout of his classroom was, perhaps, among the most unique classroom environments that I personally observed. I would have liked to spend more time observing in this classroom.

### **Conclusion**

These teachers face a multitude of challenges. From lack of resources to lack of money to lack of time to issues with classroom management, these teachers have their hands full. Blending video games into the mix is a challenge these teachers acknowledge poses hurdles, yet they continue to embrace change. One commonality among all of the teachers is the idea of "adapt or stagnate." These teachers identify themselves as different compared to the majority of their peers. It's something that they take great pride and ownership of. Many commented on the fact that they observe fellow educators in their schools that are averse to the thought of using video games. These teachers have observed a reluctance among their peers to adopt educational video games.

The rationale behind "adapt or stagnate", however, seems to stem from their observations and opinions of the culture of kids today. They know their students go home and are immersed

in technology and video games. Many confided in me that they are in direct competition with these digital experiences. They have rationalized that, rather than try to compete or bore their students, they will use the video games to their advantage, in their personal instruction.

Perhaps it is the personality of these teachers that plays the biggest part—these teachers respond well to change. They could very well disregard the application of video games. They could fall back to traditional instruction that is teacher-centered, lecture-driven. However, they make the choice to go outside of their comfort zones and use these video games in their classrooms. The games may not be particularly sophisticated—in fact, some may not even qualify as video games—but these teachers are willing to welcome new concepts into their instruction, which makes them stand out in the crowd.

This chapter discussed findings, identified the limitations of the research, and offered suggestions for future scholarly endeavors, as well as considerations—food for thought as it relates to how educational video games are playing a part in the teacher lifeworld. There is still much to explore as it relates to educational digital games and their place in public schools today. The overarching goal is that this body of research will prove valuable to fellow scholars, teachers, administrators, game designers, and academic reformists.

### Appendix: Interview Protocol

I would like to talk with you today about your experiences using educational video games in your classroom. My study does not aim to evaluate your techniques or experiences. Rather, I am trying to learn more about how the experience of teaching with video games may influence instructors' classroom practices, as well as their understandings about teaching and learning.

To complement my note-taking, I will be video-recording our conversation today. The video file will be password-protected and stored on a personal hard drive. With your consent on file, I will be the only person who has access to the original recordings. Before we begin, I want to assert that I have been granted permission from Penn State's Office of Research Protections to conduct these interviews and inform you that your participation in this interview is voluntary and you may skip questions you do not wish to answer. Additionally, you may stop at any time. I expect the interview to last between 60 and 90 minutes.

I would like to start by talking about your teaching background and learn some of your thoughts about effective teaching. Then we'll move on to talking about educational video games and wrap up with how the two modalities compare with one another and how teaching with video games has influenced your teaching practices.

#### QUESTIONS FOR TEACHERS:

- Tell me about yourself.
  - What grade do you teach?
  - How many years of experience do you have teaching?
  - How old are you?
- What is your personal philosophy of teaching?
  - What experiences as a teacher can you recall that reflect your personal philosophy of teaching?
- When you think of all the game-using teachers in the world, how do you see yourself fitting into that group?
- When you think about effective teaching using video games, what are some of the markers that would help you recognize it? Do you see those markers when you use games?

Depending on response, interviewee may be prompted to talk about the following categories:

- Course information provided to students, e.g., items on syllabus
- Instructional scaffolds provided to students, e.g., exemplars of prior student work
- In-class activities, e.g., small group work
- Features of assignments, e.g., opportunities to work on authentic tasks
- Instructor feedback, including timeliness and targetedness

- Solicitation of student input, e.g., mid-course survey
  - Type and distribution of assessments that contribute to overall grade
- To what extent do you use video games in your classroom?
- Can you tell me the titles of the games you use in your classroom?
  - Can you describe the game (X-title) to me?
  - What happens in that game?
- How do video games function in your classroom?
- What specific role(s) do you see video games playing in the classroom for you? For students?
- What was your preparation/training for the usage of educational video games?
- How did you come to teach using video games?
- What had been your experience with video games as a teaching tool before actually implementing video games in your own classroom?
- In your opinion, what are the similarities and differences between your methods of instruction and educational video games?
- How has teaching with educational video games influenced your thoughts about what constitutes effective teaching?
- What value do you place on the use of video games as an instructional tool in the classroom? Why?
- What factors might deter you from using video games in the classroom? Why?
- What are your thoughts about video games, in general? Do you play any games at home or for leisure? For each game mentioned:
  - Why do you play that game?
  - What about that game interests you or engages you?
  - How much time would you say you spend playing that game?
- Are there lessons you teach differently now that you use educational video games?

- Have you implemented (or considered implementing) a teaching strategy or learning activity in your interpersonal instruction that you learned from teaching with video games?
- Are there any other changes related to your teaching practice that you have experienced as a result of using educational video games?
- What is the difference between the educational video games you use compared to instructional methods prior to the technology push?
- Do you perceive any obstacles to including these or any other video games into your classrooms?

## References:

- Abt, C. (1987). *Serious games*. University Press of America.
- Adachi, P. (2015). Demolishing the Competition: The Association between Competitive Video Game Play and Aggression among Adolescents and Young Adults.
- Alias, N., Rosman, F., Rahman, M. N. A., & Dewitt, D. (2015). The potential of video game in Malay language learning for foreign students in a public higher education institution. *Procedia-Social and Behavioral Sciences*, 176, 1020-1027.
- Anand, V. (2007). A study of time management: The correlation between video game usage and academic performance markers. *CyberPsychology & Behavior*, 10(4), 552-559.
- Anderson, C. A., & Bushman, B. J. (2001). Effects of violent video games on aggressive behavior, aggressive cognition, aggressive affect, physiological arousal, and prosocial behavior: A meta-analytic review of the scientific literature. *Psychological science*, 12(5), 353-359.
- Anderson, C. A., Bushman, B. J., Donnerstein, E., Hummer, T. A., & Warburton, W. (2015). SPSSI research summary on media violence. *Analyses of Social Issues and Public Policy*, 15(1), 4-19.
- Anderson, C. A. (2004). An update on the effects of playing violent video games. *Journal of adolescence*, 27(1), 113-122.
- Andrews, M. W. (2016). *Investigating Prosocial Gameplay and Prosocial Self-Concept* (Doctoral dissertation, Towson University).
- Angen, M. J. (2000). Evaluating interpretive inquiry: Reviewing the validity debate and opening the dialogue. *Qualitative health research*, 10(3), 378-395.
- Armstrong, A. (2014). Technology in the classroom: It's not a matter of 'if,' but 'when' and 'how'. *The Education Digest*, 79(5), 39-46.
- Bandura, A. (1969). Principles of behavior modification.
- Baek, Y. K. (2008). What hinders teachers in using computer and video games in the classroom? Exploring factors inhibiting the uptake of computer and video games. *CyberPsychology & Behavior*, 11(6), 665-671.
- Bakhru, K., Sanghi, D. S., & Medury, D. Y. (2013). Ranking teaching competencies: Teachers and administrators perception. *International Journal of Organizational Behavior & Management Perspectives*, 2(3), 540-550.
- Barata, G., Gama, S., Jorge, J., & Gonçalves, D. (2013, September). Engaging engineering students with gamification. In *Games and Virtual Worlds for Serious Applications (VS-GAMES), 2013 5th International Conference on* (pp. 1-8). IEEE.



- Bauer, J., Ketschau, A., Brücher, B., Bodendorf, F., Skibbe, A., Rashid, R., & Franke, J. (2016). Development of an Intelligent System to Strengthen Cognitive and Motor Skills in the Home Environment. In *Advanced Engineering Forum* (Vol. 19, pp. 141-148). Trans Tech Publications.
- Bavelier, D., & Green, C. S. (2016). The Brain-Boosting Power of Video Games. *Scientific American*, 315(1), 26-31.
- Beck, C. M., Crittenden, B. S., & Sullivan, E. (Eds.). (2016). *Moral education*. University of Toronto Press.
- Beck, J. C., & Wade, M. (2004). Got game. *Harvard Business School Press, Boston*.
- Becker, K. (2017). Game-Based Lessons. In *Choosing and Using Digital Games in the Classroom* (pp. 243-299). Springer International Publishing.
- Bernard, H.R. (2006). *Research methods in anthropology: Qualitative and quantitative methods* (4th ed.). Walnut Creek, CA: AltaMira Press.
- Bingimlas, K. A. (2009). Barriers to the successful integration of ICT in teaching and learning environments: A review of the literature. *Eurasia journal of mathematics, science & technology education*, 5(3).
- Birk, M. V., Atkins, C., Bowey, J. T., & Mandryk, R. L. (2016, May). Fostering Intrinsic Motivation through Avatar Identification in Digital Games. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems* (pp. 2982-2995). ACM.
- Boersma, A., ten Dam, G., Wardekker, W., & Volman, M. (2016). Designing innovative learning environments to foster communities of learners for students in initial vocational education. *Learning Environments Research*, 19(1), 107-131.
- Bogost, I. (2007). *Persuasive games: The expressive power of videogames*. Mit Press.
- Bowen, G. A. (2008). Naturalistic inquiry and the saturation concept: a research note. *Qualitative research*, 8(1), 137-152.
- Boxer, P., Groves, C. L., & Docherty, M. (2015). Video Games Do Indeed Influence Children and Adolescents' Aggression, Prosocial Behavior, and Academic Performance A Clearer Reading of Ferguson (2015). *Perspectives on Psychological Science*, 10(5), 671-673.
- Briesch, A. M., & Chafouleas, S. M. (2009). Review and analysis of literature on self-management interventions to promote appropriate classroom behaviors (1988–2008). *School Psychology Quarterly*, 24(2), 106.

- Briggle, A., Holbrook, J. B., Oppong, J., Hoffmann, J., Larsen, E. K., & Pluscht, P. (2016). Research Ethics Education in the STEM Disciplines: The Promises and Challenges of a Gaming Approach. *Science and engineering ethics*, 22(1), 237-250.
- Bringle, R. G., Reeb, R. N., Brown, M. A., & Ruiz, A. I. (2016). Psychologically literate citizens: Civic learning for the public good.
- Brom, C., Preuss, M., & Klement, D. (2011). Are educational computer micro-games engaging and effective for knowledge acquisition at high-schools? A quasi-experimental study. *Computers & Education*, 57(3), 1971-1988.
- Brophy, J. E. (2013). *Motivating students to learn*. New York, NY: Routledge Publishing.
- Buelow, M. T., Okdie, B. M., & Cooper, A. B. (2015). The influence of video games on executive functions in college students. *Computers in Human Behavior*, 45, 228-234.
- Bull, G., & Thompson, A. (2004). Establishing a framework for digital images in the school curriculum. *Leading and Learning with Technology*, 31(8), 14–17.
- Bushman, B. J. (2016). Violent media and hostile appraisals: A meta-analytic review. *Aggressive behavior*.
- Cabot, S., & Wilkinson, B. (2016, September). Using Mobile-Based Games as a Means for the Self-treatment of Depression and Anxiety in Youth. In *Joint International Conference on Serious Games* (pp. 128-133). Springer International Publishing.
- Cain, J. (2008). Online social networking issues within academia and pharmacy education. *American journal of pharmaceutical education*, 72(1), 10.
- Calvert, S. L. (2015). Children and digital media. *Handbook of Child Psychology and Developmental Science*.
- Cellante, D. L., Mishra, S., Campbell, B. R., Hansen, M. A., & Buxton, G. A. (2017). The perceptions of middle school teachers about the integration of stem+ c: A focused-group approach. *Issues in Information Systems*, 18(1).
- Chaplain, R. (2016). *Teaching Without Disruption in the Primary School: A Practical Approach to Managing Pupil Behaviour*. Routledge.
- Corbin, J., & Strauss, A. (2014). Basics of qualitative research: Techniques and procedures for developing grounded theory. Sage publications.
- Creswell, J. W. (1998). Qualitative inquiry and research design Thousand Oaks. *London and New Delhi: Sage Publications*.
- Dahlberg, K. (2006). The essence of essences—the search for meaning structures in phenomenological analysis of lifeworld phenomena. *International journal of qualitative studies on health and well-being*, 1(1), 11-19.

- Darling-Hammond, L. (2015). *The flat world and education: How America's commitment to equity will determine our future*. Teachers College Press.
- De Aguilera, M., & Mendiz, A. (2003). Video games and education:(Education in the Face of a “Parallel School”). *Computers in Entertainment (CIE)*, 1(1), 1.
- DeRosier, M. E., & Thomas, J. M. (2018). Video Games and Their Impact on Teens’ Mental Health. In *Technology and Adolescent Mental Health* (pp. 237-253). Springer, Cham.
- Desai, R. A., Krishnan-Sarin, S., Cavallo, D., & Potenza, M. N. (2010). Video-gaming among high school students: health correlates, gender differences, and problematic gaming. *Pediatrics*, 126(6), e1414-e1424.
- Deterding, S. (2014). Eudaimonic design, or: Six invitations to rethink gamification.
- Dickey, M. (2006). Game design narrative for learning: Appropriating adventure game design narrative devices and techniques for the design of interactive learning environments. *ETR&D*, 54(3), 245–263.
- Din, N., Haron, S., & Rashid, R. M. (2016). Can Self-directed Learning Environment Improve Quality of Life?. *Procedia-Social and Behavioral Sciences*, 222, 219-227.
- Domínguez, A., Saenz-de-Navarrete, J., De-Marcos, L., Fernández-Sanz, L., Pagés, C., Martínez-Herráiz, J.J. (2013). Gamifying learning experiences: Practical implications and outcomes. *Computers & Education*, 63, 380-392.
- Donovan, T. (2010). *Replay: The history of video games*. East Sussex, UK: Yellow Ant Publications.
- Downes, J. M., & Bishop, P. (2012). Educators engage digital natives and learn from their experiences with technology: Integrating technology engages students in their learning. *Middle School Journal*, 43(5), 6-15.
- Dunleavy, M., & Dede, C. (2014). Augmented reality teaching and learning. In *Handbook of research on educational communications and technology* (pp. 735-745). Springer, New York, NY.
- Egenfeldt-Nielsen, S., Smith, J. H., & Tosca, S. P. (2016). *Understanding video games: The essential introduction*. Routledge.
- Elbertson, N. A., Brackett, M. A., & Weissberg, R. P. (2010). School-based social and emotional learning (SEL) programming: Current perspectives. In *Second international handbook of educational change* (pp. 1017-1032). Springer Netherlands.
- Emmer, E., Sabornie, E., Evertson, C. M., & Weinstein, C. S. (Eds.). (2013). *Handbook of classroom management: Research, practice, and contemporary issues*. New York, NY: Routledge Publishing.

- Entertainment Software Association. (2016). Essential Facts about the Computer and Video Game Industry 2016 *Press Release*. [Online] <http://essentialfacts.theesa.com/Essential-Facts-2016.pdf>.
- Ferguson, C. J. (2015). Does media violence predict societal violence? It depends on what you look at and when. *Journal of Communication*, 65(1), E1-E22.
- Ferguson, C. J. (2010). Blazing angels or resident evil? Can violent video games be a force for good?. *Review of General Psychology*, 14(2), 68.
- Ferguson, C. J. (2015). Do Angry Birds make for angry children? A meta-analysis of video game influences on children's and adolescents' aggression, mental health, prosocial behavior, and academic performance. *Perspectives on Psychological Science*, 10(5), 646-666.
- Ferguson, C. J., & Olson, C. K. (2014). Video Game Violence Use Among "Vulnerable" Populations: The Impact of Violent Games on Delinquency and Bullying Among Children with Clinically Elevated Depression or Attention Deficit Symptoms. *Journal of youth and adolescence*, 43(1), 127-136.
- Ferguson, C. J., & Colwell, J. (2016). A Meaner, More Callous Digital World for Youth? The Relationship Between Violent Digital Games, Motivation, Bullying, and Civic Behavior Among Children.
- Finlay, L. (2003). Through the looking glass: Intersubjectivity and hermeneutic reflection. *Reflexivity: A practical guide for researchers in health and social sciences*, 106-119.
- Flanagan, C. A., Kim, T., Collura, J., & Kopish, M. A. (2015). Community service and adolescents' social capital. *Journal of Research on Adolescence*, 25(2), 295-309.
- Flynn, R. M., Lissy, R., Alicea, S., Tazartes, L., & McKay, M. M. (2016). Professional development for teachers plus coaching related to school-wide suspensions for a large urban school system. *Children and Youth Services Review*, 62, 29-39.
- Folkins, J. W., Brackenbury, T., Krause, M., & Haviland, A. (2016). Enhancing the therapy experience using principles of video game design. *American Journal of Speech-Language Pathology*, 25(1), 111-121.
- Foster, A. N., Shah, M., & Duvall, M. (2016). Game Network Analysis: For Teaching with Games. *Teacher Education: Concepts, Methodologies, Tools, and Applications: Concepts, Methodologies, Tools, and Applications*, 371.
- Fullan, M. (2002). The change. *Educational leadership*, 59(8), 16-20.
- Furtak, E. M., & Kunter, M. (2012). Effects of autonomy-supportive teaching on student learning and motivation. *The Journal of Experimental Education*, 80(3), 284-316.

- Gallimberti, L., Buja, A., Chindamo, S., Rabensteiner, A., Terraneo, A., Marini, E., Pérez, L.J.G. & Baldo, V. (2016). Problematic Use of Video Games and Substance Abuse in Early Adolescence: A Cross-sectional Study. *American Journal of Health Behavior*, 40(5), 594-603.
- Gadamer, H. G., Weinsheimer, J., & Marshall, D. G. (2004). *EPZ Truth and Method*. Bloomsbury Publishing USA.
- Gao, Z., Chen, S., Pasco, D., & Pope, Z. (2015). A meta-analysis of active video games on health outcomes among children and adolescents. *Obesity reviews*, 16(9), 783-794.
- Gee, J.P. (1990). *Social linguistics and literacies: Ideology in discourses, critical perspectives on literacy and education*. New York, NY: The Cromwell Press.
- Gee, J. P. (2003). What video games have to teach us about learning and literacy. *Computers in Entertainment (CIE)*, 1(1), 20-20.
- Gee, J.P. (2007). *Good video games + good learning: Collected essays on video games, learning and literacy*. New York, NY: Peter Lang Publishing, Inc.
- Gee, J.P. (2007). *What video games have to teach us about learning and literacy*. New York, NY: Palgrave Macmillan.
- Gee, J. P. (2016). *Gaming lives in the twenty-first century: Literate connections*. G. Hawisher, & C. Selfe (Eds.). Springer.
- Gentile, D. A., Swing, E. L., Anderson, C. A., Rinker, D., & Thomas, K. M. (2016). Differential neural recruitment during violent video game play in violent-and nonviolent-game players. *Psychology of Popular Media Culture*, 5(1), 39.
- George, A. M., Rohr, L. E., & Byrne, J. (2016). Impact of Nintendo Wii games on physical literacy in children: Motor skills, physical fitness, activity behaviors, and knowledge. *Sports*, 4(1), 3.
- Gerber, H. R., Abrams, S. S., Onwuegbuzie, A. J., & Bengue, C. L. (2014). From Mario to FIFA: what qualitative case study research suggests about games-based learning in a US classroom. *Educational Media International*, 51(1), 16-34.
- Gibson, D., Aldrich, C., & Prensky, M. (2007). *Games and simulations in online learning: Research and development frameworks*. Pennsylvania: Information Science Publishing.
- Gikas, J., & Grant, M. M. (2013). Mobile computing devices in higher education: Student perspectives on learning with cellphones, smartphones & social media. *The Internet and Higher Education*, 19, 18-26.
- Given, L. M. (Ed.). (2008). *The Sage encyclopedia of qualitative research methods*. Sage Publications.

- Glickman, C., & Wolfgang, C. (1986). Solving discipline problems: Strategies for classroom teachers. *Boston: Allyn and Bacon, Inc, 1(980)*, p358.
- Glynn, J. (2016). Guns and games: the relationship between violent video games and gun crimes in America. *Arts and Social Sciences Journal, 2016*.
- Goran, I. (2017). Cyber Security Risks in Public High Schools.
- Graneheim, U. H., & Lundman, B. (2004). Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse education today, 24(2)*, 105-112.
- Granic, I., Lobel, A., & Engels, R. C. (2014). The benefits of playing video games. *American Psychologist, 69(1)*, 66.
- Green, C. S., & Bavelier, D. (2012). Learning, attentional control, and action video games. *Current biology, 22(6)*, R197-R206.
- Greenberg, J., Putman, H., & Walsh, K. (2014). Training Our Future Teachers: Classroom Management. Revised. *National Council on Teacher Quality*.
- Greenfield, P. M. (2014). *Mind and media: The effects of television, video games, and computers*. Psychology Press.
- Greitemeyer, T. (2014). I am right, you are wrong: How biased assimilation increases the perceived gap between believers and skeptics of violent video game effects. *PloS one, 9(4)*, e93440.
- Greitemeyer, T., & Mügge, D. O. (2014). Video games do affect social outcomes a meta-analytic review of the effects of violent and prosocial video game play. *Personality and Social Psychology Bulletin, 0146167213520459*.
- Griffiths, D., Mark, J, Kuss, D.J., King, D. L. (2012). Video game addiction: Past, present and future. *Current Psychiatry Reviews, 8(4)*, 308-318.
- Griffiths, M. D., Van Rooij, A. J., Kardefelt-Winther, D., Starcevic, V., Király, O., Pallesen, S., Müller, K., Dreier, M., Carras, M., Prause, N. & King, D.L. & King, D. L. (2016). Working towards an international consensus on criteria for assessing Internet Gaming Disorder: a critical commentary on Petry et al.(2014)[forthcoming]. *Addiction, 111(1)*, 167-175.
- Gros, B. (2015). Integration of Digital Games in Learning and E-learning Environments: Connecting Experiences and Context. In *Digital Games and Mathematics Learning* (pp. 35-53). Springer Netherlands.
- Groves, C. L., & Anderson, C. A. (2017). Negative Effects of Video Game Play 49. *Handbook of Digital Games and Entertainment Technologies, 1297*.

- Guba, E.G. (1981). Criteria for assessing the trustworthiness of naturalistic inquiries, *Educational Communication and Technology Journal*, 29, 75–91.
- Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field methods*, 18(1), 59-82.
- Gunter, B. (2016). Can Video Games Influence Levels of Real Violence?. In *Does Playing Video Games Make Players More Violent?* (pp. 147-164). Palgrave Macmillan UK.
- Gunter, B. (2016). What Is the Overall State of Evidence Concerning the Effects of Violent Video Games. In *Does Playing Video Games Make Players More Violent?* (pp. 239-259). Palgrave Macmillan UK.
- Haedicke, M. A., & Hallett, T. (2015). Research Strategies for Inhabited Institutionalism 1. *Handbook of Qualitative Organizational Research: Innovative Pathways and Methods*.
- Hamilton, S., Symonds, W., & Kotamraju, P. (2013). Career and Technical Education and New York State Regents Examinations. Haedicke, M. A., & Hallett, T. (2015). Research Strategies for Inhabited Institutionalism 1. *Handbook of Qualitative Organizational Research: Innovative Pathways and Methods*.
- Hannafin, M. J., Hill, J. R., Land, S. M., & Lee, E. (2014). Student-centered, open learning environments: Research, theory, and practice. In *Handbook of research on educational communications and technology* (pp. 641-651). Springer New York.
- Hanus, M. D., & Fox, J. (2015). Assessing the effects of gamification in the classroom: A longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance. *Computers & Education*, 80, 152-161.
- Heidegger, M. (1927). 1962 Being and Time. *Trans. John Macquarrie and Edward Robinson. San Francisco: Harper and Row*.
- Hill, R. (2012). *SecEd Guide to...Outstanding Teaching*. Association of School and College Leaders.
- Hilliard, L. J., Buckingham, M. H., Geldhof, G. J., Gansert, P., Stack, C., Gelgoot, E. S., Bers, M. U. & Lerner, R. M. (2016). Perspective taking and decision-making in educational game play: A mixed-methods study. *Applied Developmental Science*, 1-13.
- Hobbs, V. (2007). Faking it or hating it: can reflective practice be forced?. *Reflective practice*, 8(3), 405-417.
- Hoffart, N. (1991). A member check procedure to enhance rigor in naturalistic research. *Western Journal of Nursing Research*, 13(4), 522-534.
- Huizinga, J. (1950). *Homo ludens: A study of the play element in culture*. Boston, MA: The Beacon Press.

- Husserl, E. (2012). *Ideas: General introduction to pure phenomenology*. Routledge.
- Husserl, E. (1989). Ideas pertaining to a pure phenomenological philosophy. *Second book: Studies in the phenomenology of constitution*. The Hague: Kluwer Academic Publishers.
- Hwang, G. J., Wu, P. H., & Chen, C. C. (2012). An online game approach for improving students' learning performance in web-based problem-solving activities. *Computers & Education*, 59(4), 1246-1256.
- ISFE. (2016). GameTrack European digest: quarter 1 2016. [http://www.isfe.eu/sites/isfe.eu/files/attachments/gametrack\\_european\\_summary\\_data\\_2016\\_q1.pdf](http://www.isfe.eu/sites/isfe.eu/files/attachments/gametrack_european_summary_data_2016_q1.pdf). Accessed June 2016.
- Ito, M. (2008). Education vs. entertainment: A cultural history of children's software. *The ecology of games: Connecting youth, games, and learning*, 89-116.
- Ivory, J. D., & Ivory, A. H. (2015). 10 Playing around with Causes of Violent Crime. *Video Game Policy: Production, Distribution, and Consumption*.
- Jacobs, H. (2010). Towards a phenomenological account of personal identity. In *Philosophy, phenomenology, sciences* (pp. 333-361). Springer Netherlands.
- Jennings, P. A., & Greenberg, M. T. (2009). The prosocial classroom: Teacher social and emotional competence in relation to student and classroom outcomes. *Review of educational research*, 79(1), 491-525.
- Jensen, D. (2008). Confirmability. In *The Sage Encyclopedia of Qualitative Research Methods*. Thousand Oaks, CA: SAGE Publications.
- Junco, R. (2012). The relationship between frequency of Facebook use, participation in Facebook activities, and student engagement. *Computers & Education*, 58(1), 162-171.
- Junco, R., Heiberger, G., & Loken, E. (2011). The effect of Twitter on college student engagement and grades. *Journal of computer assisted learning*, 27(2), 119-132.
- Ke, F. (2016). Designing and integrating purposeful learning in game play: a systematic review. *Educational Technology Research and Development*, 64(2), 219-244.
- Ke, F., & Hsu, Y. C. (2015). Mobile augmented-reality artifact creation as a component of mobile computer-supported collaborative learning. *The Internet and Higher Education*, 26, 33-41.
- Thomas, K. M., O'Bannon, B. W., & Bolton, N. (2013). Cell phones in the classroom: Teachers' perspectives of inclusion, benefits, and barriers. *Computers in the Schools*, 30(4), 295-308.
- Kirschner, P. A., & Karpinski, A. C. (2010). Facebook® and academic performance. *Computers in human behavior*, 26(6), 1237-1245.



- Klimmt, C., & Hartmann, T. (2006). Effectance, self-efficacy, and the motivation to play video games. *Playing video games: Motives, responses, and consequences*, 133-145.
- Klopfer, E. (2008). *Augmented learning: Research and design of mobile educational games*. MIT press.
- Kochenderfer-Ladd, B., & Ladd, G. W. (2016). Integrating academic and social-emotional learning in classroom interactions. Handbook of social influences in school contexts. Social-emotional, motivation and cognitive outcomes. New York, NY: Routledge, 349-366.
- Koo, G., & Seider, S. (2010). Video games for pro-social learning. In Schrier, K. (Ed.), *Ethics and game design: Teaching values through play* (pp. 16-33). New York: IGI Global.
- Kopcha, T. J. (2012). Teachers' perceptions of the barriers to technology integration and practices with technology under situated professional development. *Computers & Education*, 59(4), 1109-1121.
- Kuh, G. D. 2009. "What Student Affairs Professionals Need to Know About Student Engagement." *Journal of College Student Development* 50 (6): 683–706. Lane, S. D., and T. N.
- Kvale, S. (1996) *Interviews: An Introduction to Qualitative Research Interviewing*. Sage Publications.
- Laffan, D. A., Greaney, J., Barton, H., & Kaye, L. K. (2016). The relationships between the structural video game characteristics, video game engagement and happiness among individuals who play video games. *Computers in Human Behavior*, 65, 544-549.
- Laverty, S. M. (2003). Hermeneutic phenomenology and phenomenology: A comparison of historical and methodological considerations. *International journal of qualitative methods*, 2(3), 21-35.
- Leininger, M. (1994). Evaluation criteria and critique of qualitative research studies. *Critical issues in qualitative research methods*, 95-115.
- Lenhart, A. (2010). *Cell phones and American adults: They make just as many calls, but text less often than teens*. Pew Internet & American Life Project. Retrieved from [http://www.pewinternet.org/~media/Files/Reports/2010/PIP\\_Adults\\_Cellphones\\_Report\\_2010.pdf](http://www.pewinternet.org/~media/Files/Reports/2010/PIP_Adults_Cellphones_Report_2010.pdf)
- Lewis, D. (2009). Zero tolerance - what does it really mean?. *Edu-safe*. Retrieved from [http://www.edu-safe.org/blog/view/zero\\_tolerance](http://www.edu-safe.org/blog/view/zero_tolerance)
- Lincoln, Y.S. & Guba, E.G. (1985). *Naturalistic inquiry*, Beverly Hills, CA: Sage.

- Lindgren, R., Tscholl, M., Wang, S., & Johnson, E. (2016). Enhancing learning and engagement through embodied interaction within a mixed reality simulation. *Computers & Education*, 95, 174-187.
- Looi, C. K., Sun, D., Wu, L., Seow, P., Chia, G., Wong, L. H., ... & Norris, C. (2014). Implementing mobile learning curricula in a grade level: Empirical study of learning effectiveness at scale. *Computers & Education*, 77, 101-115.
- Lu, A. S., Buday, R., Thompson, D., & Baronowski, T. (2016). What type of narrative do children prefer in active video games? An exploratory study of cognitive and emotional responses. *Emotions, technology and digital games*, 137-155.
- Madden, M., Lenhart, A., Duggan, M., Cortesi, S., & Gasser, U. (2013). *Teens and technology 2013*. Pew Internet & American Life Project.
- Magnussen, R., Hansen, S. D., Planke, T., & Sherson, J. F. (2015). Games as a platform for student participation in authentic scientific research. *arXiv preprint arXiv:1511.01653*.
- Maguth, B. M., List, J. S., & Wunderle, M. (2015). Teaching Social Studies with Video Games. *The Social Studies*, 106(1), 32-36.
- Malone, T. W. (1981 ). Toward a theory of intrinsically motivating instruction. *Cognitive Science*, 4,333-369.
- Marshall, C., & Rossman, G. B. (2014). *Designing qualitative research*. Sage publications.
- Matchan, L. (2015, June 16) Schools seek balance for cellphones in class: Are they a teaching tool or a distraction?. *BostonGlobe.com*. Retrieved August 23, 2015 from <https://www.bostonglobe.com/lifestyle/style/2015/06/15/cellphones-school-teaching-tool-distraction/OzHjXyL7VVIXV1AEkeYTiJ/story.html>
- Matzat, U., & Vrieling, E. (2015). Self-regulated learning and social media—a ‘natural alliance? Evidence on students’ self-regulation of learning, social media use and student-teacher relationship.
- McCauley, B., Kopanidis, F., & Farrelly, F. (2016). Towards an understanding of the motivations to play games on smartphones. In *Looking Forward, Looking Back: Drawing on the Past to Shape the Future of Marketing* (pp. 273-275). Springer International Publishing.
- McClanahan, B., Williams, K., Kennedy, E., & Tate, S. (2012). A breakthrough for Josh: How use of an iPad facilitated reading improvement. *TechTrends*,56(3), 20-28.
- McClellan, D. R. (2015). *Strategic planning: As simple as a,b,c*. Lulu Publishing.
- McDonald, F. J. (1973). Behavior Modification In Teacher Education. *Yearbook of the National Society for the Study of Education*.

- McGonigal, J. (2011). *Reality is broken: Why games make us better and how they can change the world*. Penguin.
- Merleau-Ponty, M., & Smith, C. (1996). *Phenomenology of perception*. Motilal Banarsidass Publishe.
- Moreno-Ger, P., Burgos, D., Martínez-Ortiz, I., Sierra, J. L., & Fernández-Manjón, B. (2008). Educational game design for online education. *Computers in Human Behavior*, 24(6), 2530-2540.
- Moustakas, C. (Ed.). (1994). *Phenomenological research methods*. Sage.
- Muhonen, H., Rasku-Puttonen, H., Pakarinen, E., Poikkeus, A. M., & Lerkkanen, M. K. (2016). Scaffolding through dialogic teaching in early school classrooms. *Teaching and Teacher Education*, 55, 143-154.
- Novak, E., Johnson, T. E., Tenenbaum, G., & Shute, V. J. (2016). Effects of an instructional gaming characteristic on learning effectiveness, efficiency, and engagement: using a storyline for teaching basic statistical skills. *Interactive Learning Environments*, 24(3), 523-538.
- Novak, E., & Tassell, J. (2015). Using video game play to improve education-majors' mathematical performance: An experimental study. *Computers in Human Behavior*, 53, 124-130.
- Orb, A., Eisenhauer, L., & Wynaden, D. (2001). Ethics in qualitative research. *Journal of nursing scholarship*, 33(1), 93-96.
- Pace, J. L. (2016). Cultivating Student Voice and Civic Engagement in Elementary School. *Theory & Research in Social Education*, 44(2), 277-282.
- Patterson, M. E. & Williams, D. R. (2002). *Collecting and analyzing qualitative data: hermeneutic principles, methods, and case examples*. Sagamore Publishing, Champaign, IL.
- Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage.
- Paul, J. A., Baker, H. M., & Cochran, J. D. (2012). Effect of online social networking on student academic performance. *Computers in Human Behavior*, 28(6), 2117-2127.
- Piaget, J. (1967)., *Biology and knowledge*, Edinburgh: Edinburgh University Press, 1971.
- Picard, R. W., Papert, S., Bender, W., Blumberg, B., Breazeal, C., Cavallo, D., Machover, T., Resnick, M., Roy, D., & Strohecker, C. (2004). Affective learning—a manifesto. *BT technology journal*, 22(4), 253-269.

- Polat, U. (2016). Advanced Perceptual Learning Techniques Induce Neuroplasticity to Enable Improved Visual Functions. *Current Ophthalmology Reports*, 4(1), 1-7.
- Prensky, M. (2005). *Computer games and learning: Digital game-based learning*. In Raessens, and Goldstein (Eds) *Handbook of Computer Game Studies*; The MIT Press.
- Pressey, B. (2013). Comparative Analysis of National Teacher Surveys. *Joan Ganz Cooney Center*.
- Pusey, M., & Pusey, G. (2016). Using Minecraft in the Science Classroom. *International Journal of Innovation in Science and Mathematics Education (formerly CAL-laborate International)*, 23(3).
- Ravitch, D. (2016). *The death and life of the great American school system: How testing and choice are undermining education*. Basic Books.
- Redmond, T. & Seider, S. (2012). Video games for prosocial learning. In Seel, N.M. (Ed.), *Encyclopedia of the Sciences of Learning* (pp. 3401–3404). Springer US.
- Reeves, B., Yeykelis, L., & Cummings, J. J. (2016). The use of media in Media Psychology. *Media Psychology*, 19(1), 49-71.
- Reigeluth, C. M. (1999). The elaboration theory: Guidance for scope and sequence decisions. *Instructional design theories and models: A new paradigm of instructional theory*, 2, 425-453.
- Rice, J. W. (2007). New media resistance: Barriers to implementation of computer video games in the classroom. *Journal of Educational Multimedia and Hypermedia*, 16(3), 249.
- Rigby, S., & Ryan, R. (2011). *Glued to games: How video games draw us in and hold us spellbound*. ABC-CLIO.
- Rimm-Kaufman, S. E., & Hulleman, C. S. (2015). Social and emotional learning in elementary school settings: Identifying mechanisms that matter. *The Handbook of social and emotional learning: Research and practice*, 151-166.
- Roblyer, M. D., & Doering, A. H. (2010). *Integrating educational technology into teaching* (5th ed.). Boston, MA: Allyn & Bacon/Pearson
- Rogers, R. (2016). *How Video Games Impact Players: The Pitfalls and Benefits of a Gaming Society*. Lexington Books.
- Rosas, R., Nussbaum, M., Cumsille, P., Marianov, V., Correa, M., Flores, P., Grau, V., Lagos, F., López, X., López, V. & Rodriguez, P. (2004). Beyond Nintendo: design and assessment of educational video games for first and second grade students. *Computers & Education*, 40(1), 71-94.

- Rossing, J. P., Miller, W. M., Cecil, A. K., & Stamper, S. E. (2012). iLearning: The Future of Higher Education? Student Perceptions on Learning with Mobile Tablets. *Journal of the Scholarship of Teaching and Learning*, 12(2), 1-26.
- Routledge, H. (2016). Serious Games—What, Why, How and Who?. In *Why Games Are Good For Business* (pp. 1-25). Palgrave Macmillan UK.
- Sáez-López, J. M., Román-González, M., & Vázquez-Cano, E. (2016). Visual programming languages integrated across the curriculum in elementary school: A two year case study using “Scratch” in five schools. *Computers & Education*, 97, 129-141.
- Salen, K., & Zimmerman, E. (2004). *Rules of play: Game design fundamentals*. MIT press.
- Scherer, M. (2006). Celebrate strengths, nurture affinities: A conversation with Mel Levine. *Educational Leadership*, 64(1), 8-15.
- Schleicher, A. (2016). *Teaching Excellence through Professional Learning and Policy Reform: Lessons from around the World. International Summit on the Teaching Profession*. OECD Publishing. 2, rue Andre Pascal, F-75775 Paris Cedex 16, France.
- Schrader, P. G., Deniz, H., & Keilty, J. (2016). Breaking SPORE: Building Instructional Value in Science Education using a Commercial, Off-the Shelf Game. *Journal of Learning and Teaching in Digital Age (JOLTIDA)*, 1(1), 63-73.
- Schultheiss, D., & Helm, M. (2013). Gaming in School. *Serious Games and Virtual Worlds in Education, Professional Development, and Healthcare*, 145.
- Schutz, A., & Luckmann, T. (1973). *The structures of the life-world* (Vol. 1). Northwestern University Press.
- Seidman, I. E. (2013). *Interviewing as qualitative research: A guide for researchers in education and the social sciences* (2nd ed.). New York: Teachers College Press.
- Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for information*, 22(2), 63-75.
- Shute, V. J., D'Mello, S., Baker, R., Cho, K., Bosch, N., Ocumpaugh, J., Ventura, M. & Almeda, V. (2015). Modeling how incoming knowledge, persistence, affective states, and in-game progress influence student learning from an educational game. *Computers & Education*, 86, 224-235
- Shute, V. J., & Rahimi, S. (2017). Review of computer-based assessment for learning in elementary and secondary education. *Journal of Computer Assisted Learning*, 33(1), 1-19.
- Slater, M. D., Henry, K. L., Swaim, R. C., & Anderson, L. L. (2003). Violent media content and aggressiveness in adolescents a downward spiral model. *Communication Research*, 30(6), 713-736.

- Social and Character Development Research Consortium. (2010). Efficacy of schoolwide programs to promote social and character development and reduce problem behavior in elementary school children. *Washington, DC: National Center for Education Research, Institute of Education Sciences, US Department of Education.*
- Sosa, A., Simon, G., Sweetman, R., & Rupp, M. A. (2016). Examining the restorative effects of casual video games.
- Stevens, C., & Bavelier, D. (2012). The role of selective attention on academic foundations: a cognitive neuroscience perspective. *Developmental cognitive neuroscience, 2*, S30-S48.
- Sugar, W., Crawley, F., & Fine, B. (2004). Examining teachers' decisions to adopt new technology. *Journal of Educational Technology & Society, 7*(4).
- Summers, E. J., Zadrozny, J., Van Overschelde, J., Huynh, N. T., Solem, M., & Boehm, R. G. (2017). Integrating geospatial technology in pre-service teacher training programs. *Research in Geographic Education, 19*(1), 102-26.
- Sun, H., & Gao, Y. (2015). Impact of an active educational video game on children's motivation, science knowledge, and physical activity. *Journal of Sport and Health Science.*
- Tabo, J. W., Capraro, M. M., & Yalvac, B. (2017). Where have all the tablets gone? An examination of the technology purchasing habits of suburban Texas school districts. *Research Highlights in Education and Science 2017*, 101.
- Thomas, K. M., O'Bannon, B. W., & Bolton, N. (2013). Cell phones in the classroom: Teachers' perspectives of inclusion, benefits, and barriers. *Computers in the Schools, 30*(4), 295-308.
- Tongco, M. D. C. (2007). Purposive sampling as a tool for informant selection.
- Tonkiss, F. (2004). Analysing text and speech: content and discourse analysis. *Researching society and culture, 2*, 367-382.
- Van Manen, M. (1997). *Researching lived experience: human science for an action sensitive pedagogy*. Winnipeg, CA: Hignell Book Printing.
- Van Manen, M. (2007). Phenomenology of practice. *Phenomenology & Practice, 1*(1).
- Weiss, R. S. (1995). *Learning from strangers: The art and method of qualitative interview studies*. Simon and Schuster.
- Whitaker, T., & Fiore, D. J. (2015). *Study Guide to Dealing with Difficult Parents*. Routledge.
- Wigfield, A., Gladstone, J. R., & Turci, L. (2016). Beyond Cognition: Reading Motivation and Reading Comprehension. *Child Development Perspectives.*

- Wilson, H. S., & Hutchinson, S. A. (1991). Triangulation of qualitative methods: Heideggerian hermeneutics and grounded theory. *Qualitative Health Research*, 1(2), 263-276.
- Woo, J. C. (2014). Digital Game-Based Learning Supports Student Motivation, Cognitive Success, and Performance Outcomes. *Educational Technology & Society*, 17(3), 291-307.
- Woods, M., & Rosenberg, M. E. (2015). Educational Tools: Thinking Outside the Box. *Clinical Journal of the American Society of Nephrology*, CJN-02570315.
- Zeichner, K., & Gore, J. (1990). Teacher socialization. In W. Robert Houston (Ed.), *Handbook of research on teacher education*, 329-348. New York: Macmillan.
- Zhao, Y., & Frank, K. A. (2003). Factors affecting technology uses in schools: An ecological perspective. *American educational research journal*, 40(4), 807-840.

# Vita

## Michael F. Petner Jr.

### Education

Ph.D., Learning, Design, and Technology (2018). THE PENNSYLVANIA STATE UNIVERSITY, University Park, PA

M.A., Instructional Technology (2007). THE RICHARD STOCKTON COLLEGE OF NEW JERSEY, Pomona, NJ

B.A., Elementary Education (2005). HOLY FAMILY UNIVERSITY, Philadelphia, PA

### Work Experience

**2017 – Adjunct Professor** – Instructional Design and Development, MAIT Dept. The Richard Stockton College of NJ

**2014-2017 – Banking Consultant** – TD Bank, Mt. Laurel, NJ

**2012-2013 – Instructional Assistant** – Legal and Regulatory Environment of Information Science and Technology, Penn State

**2011-2012 – Adjunct Professor** – World Technologies and Learning, Penn State

**2008-2011 – Consultant** – Earth and Mineral Sciences Library, Penn State

**2010 – Instructional Designer** – DeSales University, Center Valley, PA

**2007-2008 – Adjunct Professor** – Introduction to Instructional Technology for Educators, Penn State

**2007 – Adjunct Professor** – Instructional Technology for Teachers, Atlantic County Cape Community College

**2006-2007 – Instructional Designer** – The Richard Stockton College of NJ