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A Multicase Study of Alaskan High School Teachers' Adoption of Digital Elements of Gamification

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has been found to be complete and satisfactory in all respects,
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Walden University
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Abstract

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by

Paul Marks

MA, Spring Arbor University, 2004

BA, University of Alaska Fairbanks, 1996

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

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Abstract

Recent studies have indicated that gamification, the process of using game-like elements in nongame situations, increases student engagement and comprehension. The problem was that little is known about the extent to which digital elements of gamification are being used to help engage students in high school classes in Alaska. The purpose of this multicase study was to examine the extent to which their teachers were using gamification. The research questions that guided this study addressed the extent to which the teachers used gamification, how the teachers perceived the usefulness of gamification, and how they perceived the ease of use of gamification with a specific focus on six elements of gamification. The conceptual framework for this study combined Landers's theory of gamified learning and the technology acceptance model. A convenience sampling of 34 teachers was used, with all participants completing a specifically designed questionnaire and 14 taking part in individual interviews. The data analysis consisted of thematic analysis, which allowed for the identification of relevant commonalities. Results indicated that most of the participants used at least one gamification element at some point in their teaching, used some elements more than others depending on their familiarity with them, and perceived that different elements of gamification affected different students in different ways. The findings also suggest that researchers should analyze the elements of gamification individually rather than as a whole while focusing on the perceived usefulness and ease of use of each element.This study contributes to positive social change by providing information that could be used to create gamification systems and trainings that are targeted at meeting the needs of high school students and teachers to increase student engagement.

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Dedication

I dedicate this dissertation to my mother who not only inspired me to become an educator, but whose classroom economic system clearly laid the foundations of my interest in using gamification in education.

Acknowledgments

I am particularly indebted to my committee chair, Dr. Loren Naffziger, who has diligently guided me these past three years to get this gargantuan project completed. His advice has been invaluable in helping me overcoming difficulties, disappointments, and setbacks. Often, he gave me the exact direction I needed to get me through the rougher patches.

I would also like to thank Dr. Alia Sheety, my committee's methodologist, for her advice and insight, not to mention the willingness to read through so many pages at so many stages of disarray.

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I also would like to thank the administrators in the schools and school district where I conducted my study for their willingness to cooperate with me during this particularly stressful time.

I am also extremely grateful for all my participants who not only contributed to this study, but also provided tremendous insight into the school district and my own educational practices.

Most importantly, I would never have made it this far without the love, encouragement, and support of my wonderful wife, Janelle.

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction to the Study

Due to the physical isolation of many educational institutions in Alaska, Alaskan teachers often must rely on various elements of technology to help both themselves and their students better engage with their subject material, their classes, and the world as a whole (Graham & Fredenberg, 2015). Collins et al. (2019) noted with research into online classes that isolation has a negative impact on student engagement. One growing area in educational technology that can benefit K-12 students in Alaska in overcoming issues with isolation and engagement is gamification, which is the process of using game-like elements in nongame situations (Frost et al., 2015).

Since the term was first used in 2002, gamification has gained a great deal of interest in a wide variety of fields. Gamification is a concept based on using people's natural urge to engage in games, specifically using techniques applied in video games, to make activities in the real world more engaging (Larson, 2019). Using game-like strategies—especially leaderboards, achievements, point-based systems, avatars, and narrative scenarios—in nongame situations is a trend that can be found almost anywhere (Frost et al., 2015): (a) businesses are using gamification to not only increase customer engagement but to improve staff training (Larson, 2019), (b) car companies are using gamification to increase driver attention (Bier et al., 2019), and (c) governments are using gamification to increase participation in citizenship (Reis & Press, 2019). In all cases, gamification seems to be such an effective motivator because it satisfies humans' intrinsic needs (Xi & Hamari, 2019).

Background

Although the results of many studies of gamification have been generally positive in the field of education, the greater issue lies in what educators still do not understand about how gamification works in specific areas of education (Dichev & Dicheva, 2017). A variety of researchers have conducted studies on gamification in general and on specific aspects of gamification; however, more research still needs to be done on the subject at a wider variety of educational levels and across the country (Pektaş & Kepceoğlu, 2019). According to the director of educator and school excellence in Alaska, at this point, no research has been done in Alaska on the extent to which gamification is being used. Thus, a study needed to be conducted to explore the extent to which high school teachers are using digital elements of gamification in their daily teaching, which elements are the easiest to use, and which elements they find the most useful in motivating students in Alaska.

Problem Statement

The problem was that little is known about the extent to which digital elements of gamification are being used in high school classes in Alaska to help engage students who are dealing with the isolation that Alaskan schools and their students face. Dichev and Dicheva (2017) recommended that more research about gamification needs to be done at levels other than higher education where a large amount of research has already been conducted and that studies are needed to monitor specific elements of gamification on specific learners in specific scenarios, such as specific high school courses. In the conclusion of their study on prospective teachers' views on gamification in a distance

learning program, Pektaş and Kepceoğlu (2019) noted that further research should be conducted on teachers in various levels of the profession and who are teaching courses that are not directly tied to distance learning. These ideas indicate that researchers need to conduct studies on how teachers at the high school level are using various elements of gamification to benefit their students.

However, according to Alaska's director of educator and school excellence, no research in Alaska is currently being conducted about the use of technology in high school classrooms and that more information about how Alaskan teachers are using gamification in their classes would be beneficial to the entire state. Meanwhile, the principal of the largest high school in the Bear School District (a pseudonym) stated that the district is looking for more information about technologies that engage students as a part of its push for personalized learning.

Purpose of the Study

The purpose of this multicase study was to understand the extent to which digital gamification assets and techniques were being used by high school teachers to engage students in the Bear School District in Alaska. This helped fill the gap in literature by providing more research about how digital gamification assets were being used in high school settings. The study findings also provided knowledge relating to the gap in practice by creating a broader understanding of the usefulness of such gamification elements and their overall ease of use for teachers in the Bear School District to implement. This will help teachers know which gamification elements have been the

most effective considering time devoted to them and, thus, where they should invest their time, funding, and effort.

Research Questions

1. To what extent are digital gamification assets and techniques being used by Alaska high school teachers in their classes in the Bear School District?
2. What are the perceptions of Alaska high school teachers in the Bear School District about the usefulness of digital gamification assets and techniques to overcome student isolation and increase student engagement?
3. What are the perceptions of Alaska high school teachers in the Bear School District about the ease of use of digital gamification assets and techniques in overcoming student isolation and increasing student engagement?

Conceptual Framework

As understanding the extent to which digital gamification assets and techniques Alaskan high school teachers are being used in their classes is an extension of understanding what types of technology they have adopted, using the technology acceptance model (TAM) as a conceptual framework was a logical step. According to Scherer et al. (2019), the TAM is a mechanism that effectively describes teachers' acceptance and adoption of technology. In the TAM, it is proposed that people accept specific technology when their knowledge about and understanding of that technology coincides with and helps improve their current situation. For teachers, this means that the technology they use must provide an advantage that helps them teach their students.

Thus, teachers who are using digital gamification assets and techniques must believe that doing so enhances their students' learning.

The TAM relies on two key core variables that apply directly to teacher adoption of technology: perceived usefulness (PU) and perceived ease of use (PEU; Scherer et al., 2019). These variables are combined to form a third variable: attitudes toward technology (ATT). In most cases, these variables are used to look for one of two outcome variables: behavioral intention and technology use (USE; Scherer et al., 2019). Because this study focused on the USE of digital gamification assets and techniques, I integrated the ATT of the teacher participants into the interview questions as part of the case study. While the first research question was used to identify the USE of types of digital gamification assets and techniques, identifying ATT was established in the second and third research questions that addressed teacher perspectives about the technology.

Additionally, this study also incorporated elements of Landers's (2014) theory of gamified learning. Because one of the major components of Landers's theory was that researchers should not treat gamification as a single unit and that researchers should analyze each element of gamification separately from the others, I developed the interview questions in this study to differentiate between the various elements of gamification that the subjects may have used. Landers's theory also suggested understanding how educators use the elements of gamification, whether as a moderating or a mediating process, to foster learning. Consequently, I created the interview questions to determine whether the participants used the gamification elements directly tied to the lessons taught or as pieces of a system in which the participant taught the lessons.

Nature of the Study

I conducted this study using qualitative methodology because the extent to which digital elements of gamification were being used by high school teachers within a school district in the state of Alaska was examined (see Ravitch & Mittenfelner Carl, 2016). A multicase study design was used because it examined what practices were already in place in three high schools in the district (see Yin, 2012). I planned to select participants based on their responses to a questionnaire sent to their individual school email addresses after I first requested permission and the superintendent and principals granted it. Due to a lack of interested participants, I gave any participant who was willing to take part in the interview process the opportunity to do so and directly requested participation from individuals mentioned by administrators and other participants. The interviews took place on the Zoom platform due to the constraints of the COVID-19 pandemic. I also gave participants the opportunity to fill out a 2-week journal examining their use of digital gamification assets and techniques. I coded and analyzed the questionnaires, interviews, and journals for significant trends and outlying pieces of information (see Saldaña, 2016).

Definitions

Achievement: An element of gamification that is awarded to a student for a specific or higher level of task or learning completion. Often tied with digital badges, achievements can also be displayed on leaderboards or progress indicators. Common labels for types of achievements are badges, awards, ranks, and levels.

Avatar: A digital element of gamification where students choose or are assigned a visual character to represent them in the class. These avatars may have customizable

portions of their appearance that students can freely choose. Sometimes, students must complete specific tasks for certain customization options to be available.

Cooperation: Occasionally referred to as *groups, teams,* or *teamwork*, this term refers the idea of participants working together to accomplish a task or goal. Although sometimes described as an element of gamification, I did not include it as a separate element in this study because cooperation commonly exists outside of gamification and can thus cloud results tied to gamification—specifically digital elements of gamification that are the focus of this study.

Digital badge: A digital achievement given to a student for completing a specific task or set of tasks. Digital badges include encoded data that can explain specifically what tasks the students accomplished, when the badge was awarded, who awarded it, and any other information that the designer wants to include. Normally, students have the option of displaying digital badges on certain forms of social media. Digital badges can also be used as a means of accreditation for students who have mastered specific skills.

Freedom to fail: Sometimes referred to as *lives* in gamification parlance, this gamification element can include multiple paths to success and multiple attempts to master a skill or complete a task.

Gamification: A concept based on using people's natural urge to engage in games, specifically using techniques applied in video games, to make activities in the real world more engaging (Larson, 2019). While both the terms *gamification* and *gamified* have been used synonymously since their first use in academic literature in 2002, they did not appear in educational studies until about 2011 (Landers, 2014). Elements of

gamification include the use of achievements, avatars, digital badges, freedom to fail, leaderboards, levels, narrative, and points.

Leaderboard: An element of gamification where high scores or completion progress of students is displayed. These are usually anonymous, but with some means for students to understand where they are in comparison to other students either directly or by using top scores, means, or medians. They are sometimes referred to as *progress or status bars* and are a related gamification element that can connect a person's progress to goals set by themselves or the program and may or may not be tied to other students' progress.

Level: Aside from the use of the term *level,* which refers to a type of achievement earned, a *level* can also refer to a degree of difficulty in a gamified environment. Teachers can use levels to differentiate and personalize student learning to their abilities as well as indicate the challenge and complexity of certain assignments and tasks. While a level can also be used in gamification to indicate progress in a narrative or section of content, I did not use the term in that way for this study.

Narrative: This is an element of gamification where story elements, such as plot advancement or character development, are tied to actions taken and tasks completed by students for a learning objective. Sometimes it is referred to as *story* or *game world*.

PEU: This is an aspect of TAM in determining a person's overall attitude towards a type of technology. PEU is based on an individual's perceptions concerning how easy a specific technology is to use—either for themselves or for others (Davis, 1989).

PU: This aspect of TAM is used to determine a person's overall attitude towards a type of technology. PU is based on the tasks that an individual might wish to accomplish and that individual's views about how effectively a specific technology is in accomplishing them (Davis, 1989).

Points: This element of gamification deals with rewards given, which may or may not be linked to student grades, for the completion of tasks, often within a specific timeframe. While points can stand alone, they are often linked to other rewards, such as achievements and prizes, and to other gamification elements, such as leaderboards or new pieces of narration. They are sometimes referred to as *experience points* or *currency*.

Rewards: Sometimes referenced as *gifts,* rewards include a broad category of benefits given to a person for some action they have taken. Although occasionally used as an element of gamification, I did not use this term as a gamification element in this study because I have subdivided it into various elements of gamification, including achievements, digital badges, levels, and points. This term was only used referring to its wider usage.

TAM:. Developed by Davis (1989), this theoretical model comprised specific methods for researchers to understand why some aspects of technology are adopted and others are not. Although later adaptations include additional elements, the core mechanics are based on PU and PEU, with the former generally considered to be the primary motivator for technology adoption.

Theory of gamified learning: Developed by Landers (2014), this theory emphasized the need for each element of gamification to be researched separately or in

specific combinations to better understand how each part is connected to student learning. It focuses on two primary processes by which gamification is used in education: as a moderating process where gamification strengthens the link between instructional design and its outcomes and as a mediating process where the game elements directly engage learning. It is possible for both processes to be used by an element of gamification.

Assumptions

One of the largest assumptions of this study, which I explored in the review of literature, was that gamification is useful in education, particularly in engaging students (see Da Rocha Seixas et al., 2016). As such, an additional assumption was that teachers would have adopted elements of gamification in their courses either consciously or without realizing that was what they were doing (see Sánchez-Mena & Martí-Parreño, 2017). Connected to that was the assumption that gamification practices that these teachers have continued are elements of gamification that they believe have value for their students and their students' learning and that elements they did not believe had value were discontinued.

In this study, I assumed that not all teachers in the Bear School District would know the terms *gamification* or *gamified learning* even if they might still be using elements of these ideas in their classes. For this reason, any initial and further contact with teachers in the district defined not only the concept of gamification but also its most common elements. Because the Bear School District just completed its 4th year of a 5-year plan concerning personalized learning and digital badges—an element of gamification—were identified as components of personalized learning by the

superintendent of the district, it was quite possible that teachers in the district had more experience with elements of gamification than they might have realized.

Scope and Delimitations

Because the problem was that little is known about the extent to which Alaskan high school teachers are using digital elements of gamification in their classes to help engage students who are dealing with the isolation that Alaskan schools and their students face, a qualitative design was the most suitable approach because it allowed me to examine the existing conditions in an area (see Ravitch & Mittenfelner Carl, 2016). In this study, I focused on high school teachers from three high schools within the Bear School District in Alaska. This multicase study design allowed me to examine the district as its own case, while still noting commonalities and differences between the schools as separate cases within the district (see Yin, 2012). Questionnaires and interviews involved responses that encompassed some teachers' entire careers. Selected teachers also provided journals concerning their use of digital gamification assets and techniques over a 2-week period. I asked the teachers to identify specific elements of gamification that they used, how effective they believed them to have been, and how easy they believed they were to use.

Limitations

In this multicase study, I only focused on one school district in Alaska and was not able to consider the varied communities, teachers, and students that populate this state, let alone the nation or world. There might even be significant differences between subjects or high schools of different sizes within the study district that were not

considered in this study. To help deal with this limitation, I used three high schools within the district to create data triangulation (see Ravitch & Mittenfelner Carl, 2016). As the researcher, I also avoided making broad generalizations and conclusions based on the information (see Yin, 2012).

In this study, I acted as a lone researcher, which limited trustworthiness by not providing multiple viewpoints during coding and analysis of the data. To mitigate this limitation, my committee and a separate expert panel evaluated my data collection tools. I also field tested these tools on willing participants whom were not included in the study. Additionally, I used technology such as NVivo to help with coding of the information (see Saldaña, 2016). To ensure that I accurately transcribed and analyzed the interviews, I gave the participants the opportunity to look over the transcriptions of their interviews and a summary that I created so they could provide any corrections or clarifications. I also used questionnaires, interviews, and journals to provide methodological triangulation (see Ravitch & Mittenfelner Carl, 2016).

Significance

The significance of the study is its contribution to the understanding of the extent that digital gamification assets and techniques were used by high school teachers in one district in Alaska to increase student engagement. Because video games become more ubiquitous in society today, using elements from video games will hopefully develop a greater motivation in a generation of students who has grown up playing them, spawning a positive social change (Dichev & Dicheva, 2017). Understanding how digital gamification assets and techniques are being used will help identify how successful

various aspects of gamification are in actual—as opposed to theoretical—high school classes, the degree to which gamification is currently put to use, and where more work might be needed to increase gamification understanding and implementation (Landers, 2014). This study also highlights the strides that educators in Alaska, especially in the Bear School District, were taking to improve the experience of their students. This sort of recognition will help to indicate the ways that they are bringing the latest educational techniques and tools into their classrooms. The results of this study may also guide other teachers' work and, thus, contribute to larger social change by indicating ways to use technology to enhance students' learning experiences in isolated areas or even in places that are not geographically isolated but where students are or feel isolated due to conditions beyond their control. The findings also indicated which elements of gamification require more support in both equipment and training.

Summary

High school students in Alaska have issues with motivation in completing their schoolwork due to the isolation of Alaskan life in comparison to the rest of the world, requiring teachers to rely on technology to address this lack of motivation (Graham & Fredenberg, 2015). Studies have suggested that using elements of gamification works in improving student motivation (Zainuddin et al., 2020). According to the director of educator and school excellence in Alaska, at present, there is no information about the extent to which high school teachers in Alaska are using gamification to increase student motivation. In this study, I examined the extent to which high school teachers in Alaska were using digital assets and techniques of gamification to increase student engagement. I

incorporated the Davis's (1989) TAM by examining teacher perceptions about gamification's usefulness and ease of usefulness. I also used Landers's (2014) theory of gamified learning to examine the digital assets and techniques of gamification rather than gamification as a single construct.

I began this chapter by establishing the background for needing more research on gamification in the area of education, particularly at the high school level in Alaska. The problem statement, purpose of the study, and research questions followed. I then explained why TAM and the theory of gamified learning were appropriate to use and combine as the conceptual framework to guide this study. After providing a list of definitions for the main concepts of the study, I discussed the assumptions, scope, delimitations, and limitations of the study. The chapter ended with an explanation of the significance of this study. In Chapter 2, I address my literature search strategy, conceptual frameworks, literature review, and implications for research.

Chapter 2: Literature Review

Reviews of research on gamification have suggested that gamification increases student motivation and productivity (Dichev & Dicheva, 2017; Zainuddin et al., 2020). It is because of gamification's potential to increase student engagement that it is so important to understand how high school teachers are using gamification in their classes, and this is especially true in Alaska where students often suffer from a lack of engagement due to their isolation (Graham & Fredenberg, 2015). The purpose of this multicase study was to understand the extent to which high school teachers were using digital gamification assets and techniques to engage students in the Bear School District in Alaska.

Because gamification is still relatively new to education, there has been a limited number of scholarly writings pertaining to it, particularly in the area of high school education (Dichev & Dicheva, 2017; Zainuddin et al., 2020). In this chapter, I begin with a description of the research strategies used to find scholarly material about gamification before delving into the theoretical framework underpinning this study. Following that is an explanation of the role of gamification in education, the research done so far on the topic, and the role of this study in contributing to this field of research.

Literature Search Strategy

The primary library system used for this literature review was the Walden University Library. Within that system, the initial database of focus was Education Source; although, searches were also conducted in ERIC, EBSCO, SAGE Journals, ScienceDirect, Taylor & Francis Online, Emerald Insight, ProQuest, LearnTechLib, and

Academic Search Complete. I also searched Google Scholar, accessed through the Walden University Library portal, to find more recent information on the topic; however, these searches usually reconnected back to the databases mentioned earlier.

The most successful search term combinations for finding relevant information included *gamification*, *secondary*, and *education*. While the information from such searches delivered predominantly relevant results, it was also limited. The phrase *high school* often replaced *secondary*. In some searches, I specifically focused on *engagement* or *motivation* while others included the search terms *study* or *studies*. Sometimes, any reference to *secondary* or *high school* was dropped. To further broaden the search, I often used the terms *gamified learning* or *gamify* in place of *gamification*.

Based on my original, overly enthusiastic belief that this study would be completed in 2019, most searches were limited to the years 2014 to the present; however, exceptions were made when delving into the history of gamification and the theoretical framework for the study. After the focus of the study was changed, I redirected the searches to literature published from 2018 to the present. Exceptions to this include seminal works and literature on the theoretical concepts and methodology.

The review of literature and conversations with the Alaska's Department of Education and Early Childhood Development revealed few studies related to education in Alaska. This lack of research includes a dearth of information about how technology, let alone digital aspects of gamification, are being used in Alaska. For these reasons, I used communications with administrators at school, district, and state levels to indicate that there was a gap in local practice.

Conceptual Framework

Nacke and Deterding (2017) emphasized that for gamification research to be effective, it must be grounded in the appropriate theories. Most studies on gamification focus on how gamification motivates students and, thus, frequently use Deci and Ryan's (1985) theory of motivation as the focus of their research (Nacke & Deterding, 2017; Zainuddin et al., 2020). However, I focused this study on the extent to which teachers are using gamification rather than how it motivates students. Because of thisfocus on how teachers in Alaska are using gamification, using the TAM as the underpinning conceptual framework for the study was a logical step. TAM focuses on the reasons that teachers accept and adopt technology (Scherer et al., 2019).

One of the main components of TAM is PU, a concept directly tied to whether teachers believe gamification is useful for their classrooms in promoting student engagement (Scherer et al., 2019). In their phenomenological study of higher education instructors, Sánchez-Mena and Martí-Parreño (2017) emphasized that PU is a significant factor in teachers' reactions to and adoption of gamification in their own teaching practices. The importance of PU was also indicated in other studies. Manganello and Pozzi (2019) discovered that their participants noted an increase in PU in learning managements systems that were introduced using elements of gamification. They connected another element of TAM, PEU, in a positive correlation to the use of gamification. They also discovered that teachers' prior experience with games and gamification were likely to increase those teachers' PU and PEU of gamification elements.

Adukaite et al. (2017) noted limitations in the ability of TAM to adequately describe the reasons why educators would adopt certain types of technology for their teaching. They suggested including elements such as technological ability, perceived playfulness, connections to curriculum, appropriate level of challenge, self-efficacy, and a variety of learning opportunities. Manganello and Pozzi (2019) suggested that those elements could still be included under the larger categories of PU and PEU but referred to that framework as TAM3. In this study, I considered these subcategories while examining the extent to which Alaskan teachers are using digital elements of gamification in their teaching.

This study also included elements from Landers's (2014) theory of gamified learning because it specifically denotes the importance of identifying the various elements of gamification rather than attempting to study gamification as a single construct. The theory of gamified learning requires that researchers examine the elements of gamification individually from one another or in defined combinations to better focus on which element is most responsible for the effects that are noted. Furthermore, the theory of gamified learning differentiates between mediation or moderation as the purpose behind of each element of gamification. This way, a researcher would indicate whether the element of gamification being studied is used directly to teach a concept, if it is used only as a means to direct student attention and motivation, or some combination of the two.

Literature Review Related to Key Concepts and Variable

Gamification, the use of game structures in nongame situations, is a growing field in education and in the world at large (Dymora & Niemiec, 2019). The automobile industry is studying gamification to overcome driver fatigue, especially as the vehicle is handling more and more functions rather than the driver (Bier et al., 2019). Businesses are including elements of gamification in their training (Larson, 2019). Major corporations like Amazon are incorporating gamification into their systems for employees, consumers, and reviewers (García-Jurado et al., 2019). It is likely that gamification has become more popular because it satisfies humans' intrinsic needs (Xi & Hamari, 2019).

There are dangerous sides of gamification as well. For instance, China plans to use gamification as part of its required social monitoring system, Seseme Credit, to incentivize reporting (Reis & Press, 2019). By recording data and then making it publicly available—such as with the common gamification tool of leaderboards—governments can use gamification to monitor and, to some degree, control their citizens.

Gamification Produces Positive Results in Education

The positive aspects of gamification when dealing with education have led to a rise in its use in the past decade (Zainuddin et al., 2020). Huang and Yeh (2017) noted a marked increase in students' ability to demonstrate critical thinking skills due to using gamification. Their quantitative study was completed at a university in China by comparing pre- and posttest scores of 32 students through a course that incorporated gamification elements, including avatars, a point system, leaderboards, and freedom to

fail. Turan et al. (2016) suggested that students had higher achievement in courses that incorporated gamification; although, they also warned that gamification could increase students' cognitive loads, making the results less beneficial in the long term. They conducted their mixed-method study over a 6-week period in sixth grade classes from two schools in Turkey. Using a quasi-experimental design, they had a control class and an experimental class that included gamification elements, such as avatars, achievements, digital badges, a point system, and leaderboards. These studies show the benefits of gamification for students' critical thinking and achievement.

Love et al. (2016) indicated that gamification can improve parental involvement, even among disadvantaged and vulnerable populations. In a quantitative study, they used a single group repeated measures design to examine 155 parents of adolescent students. Participants used a social media program that included the gamification elements of achievements, avatars, digital badges, and narratives. Parents in the program not only became more involved in their students' schools and continued that involvement, but they also attributed the inclusion of gamification elements as a reason for the program's success. This finding suggests that educators can use gamification to affect parent participation, which also leads to student engagement.

Regarding student engagement, Da Rocha Seixas et al. (2016) found that using digital badging systems (i.e., a digital gamification element) increased student engagement, particularly in normally unmotivated students. Their quantitative study that used cluster analysis of 61 eighth grade students in Brazil showed a significant increase in motivation with coursework that provided digital badges on completion compared to

similar students who did not receive badges. Although Kyewski and Krämer's (2018) quantitative, between-subjects, experimental study also saw increases in student engagement using digital badges, the increases were not as much as they expected. However, they noted that the college-aged, German students involved did not see their badges as something that was desirable, indicating that care needs to be taken in the design and implementation of digital elements of gamification. In Slovakia, Pinter et al. (2020) found increases in first-year college student attendance that was tied to a system using the gamification elements of digital badges and leaderboards.

A particularly promising area for gamification in education is for teachers who are helping students overcome certain learning disabilities. For example, Dymora and Niemiec (2019) suggested that educators could successfully use gamification to help elementary school students in Poland overcome their dyslexia. In their quantitative, quasi-experimental study, they used a mobile device system that incorporated the narrative, avatar, points system, and leaderboard gamification elements. Beyond just helping students with dyslexia, their research indicated that teachers could successfully use gamification to increase reading and spelling skills with students who did not demonstrate a learning disability.

Gamification's Effects on Student Motivation

Lin and Shih (2015) discovered that digital games incorporating elements of gamification point systems and leaderboards worked better at increasing student engagement in courses than more traditional methods. In this quantitative, quasi-experimental study, college-age students in Taiwan noted a higher level of motivation to

complete the activities and greater interest in the material covered in the lessons. However, they used a small, 30-person participant pool and used the term "teenagers" in its research questions despite the participants ranging in age from 19 to 25 years old, suggesting some issues in translating the study into English. Tan and Hew's (2016) experimental, mixed-methods research supported Lin and Shih's findings, noting that college-aged students at a university in Hong Kong directly identified gamification elements, such as points, digital badges, and leaderboards, as making coursework more engaging. This result has even been indicated in situations where the digital aspects of gamification are suffering from usability issues or implementation difficulties if gamification elements remain accessible (Chen et al., 2015). Chen et al.'s (2015) qualitative research focused on 32 college-age students and alumni from a U.S. university that used a gamification system with a focus on a point-based system as a part of all of its courses.

Şahin and Namli (2016) conducted a quantitative study with a pretest-posttest experimental design and 20 sixth-grade student participants in Turkey to examine undefined gamification elements. They indicated that gamification not only increased motivation but directly affected student achievement in both direct content learning and problem-solving skills. This result was confirmed by Yildirim (2017) who found that gamification had a significant impact on student's overall comprehension in blended learning courses. Like Sahin and Namli, Yildirim employed a quantitative study with a pretest-posttest experimental design. However, Yildirim also included control groups and focused on 97 college-age students in Turkey, incorporating the gamification elements of

points, leaderboards, and digital badges in the courses taught to the experimental groups. Yildirim also noted that students had a much more positive attitude toward courses that included gamification in comparison to courses that did not.

Bovermann and Bastiaens (2019) also showed gains in both student interest and achievement in blended learning courses that used gamification as opposed to programs that did not. They used self-determination theory in a mixed-methods case study to examine the effectiveness of points and leaderboards by observing 97 college-age students in a German university. Their observations aligned with those of Tsay et al. (2018) who also used self-determination theory in a quantitative, experimental study on 136 college-age students in the United Kingdom. They noted a significant increase in motivation and achievement by students in a gamified version of a course that used points, leaderboards, and digital badges as opposed to a more traditional one. However, they also noted that students began to lose interest over time unless teachers added new, relevant gamification elements. Similarly, Bovermann and Bastiaens recognized that not all students were engaged by gamification elements.

For gamification to be truly effective, it needs continual monitoring and iteration. Barata et al. (2017) suggested this in a 3-year study in which they built a course using gamification properties, including avatars, points, digital badges, and leaderboards, and compared it to courses with identical content and assignments. Using self-determination theory as a basis, their quantitative, experimental study examined 141 college-age students in Portugal. While they noted positive effects of gamification in student motivation, participation, and achievement, they also concluded that the gamified course

needed adjustments based on student behavior. Landers and Armstrong (2017) explained that one of the areas that teachers might need to adjust is in introducing and scaffolding the elements of gamification that they used. Ina quantitative, experimental study, they examined 262 college-age students at a U.S. university and their reactions to a gamification system that used narrative, points, and leaderboards. Their research indicated that gamification had a significant impact on student outcomes but that previous student experience with systems similar to the gamification elements used was a large factor in how much gamification helped with their motivation and understanding.

Chen et al. (2015) described the need for educational gamification systems to be well prepared and explained. They further learned in their research that educators need to use elements of gamification in a consistent manner to achieve the best results. As part of that consistency, their research indicated that digital gamification elements work best when used within students' academic time throughout an educational institution, allowing them to transfer knowledge of how the system works from course to course. Da Rocha Seixas et al. (2016) supported this idea. They emphasized the need for teachers to be fully versed in the digital gamification aspects that they use in their classes.

Gamification Must Account for Student Needs and Backgrounds

Researchers have indicated that teachers need to choose gamification systems that match the level of their students' understanding and interest. Frost et al. (2015) discovered that increased complexity in gamification systems does not lead to better results. In fact, gamification systems may distract from actual learning as students focus more on the systems than on the content that the systems provide. They based their

quantitative, experimental study on self-determination theory to examine the responses of college-age students in a university in the United States to multiple elements of gamification including narrative, points, leaderboards, freedom to fail, and digital badges. They also noted the need for teachers to use elements of gamification that align with the material taught as well as student needs. Galbis-Córdova et al. (2017) stressed the need for teachers to take care in selecting gamification systems that do not exceed the skill levels or interests of their students. Their study followed a quantitative design using questionnaires that examined 128 college-age students in Spain and their reactions to unspecified elements of gamification. They found that students were more interested in gamification that was relevant to the content that they were learning as opposed to games which were not as related to the focus of their courses.

Hamari et al.'s (2018) quantitative, empirical study examined 167 participants who used a computer application that incorporated gamification elements of points, leaderboards, and digital badges. They noted that gamification has varying effects on people based on the way how goal oriented they are and how they incorporate goals in their lives. This suggests that teachers should help students make appropriate goals tied to specific gamification elements to help increase student interest and motivation.

Similarly, teachers need to take students' various backgrounds and needs into account when introducing gamified elements. Van Roy and Zaman (2019) conducted a quantitative, experimental case study based on self-determination theory that examined the perceptions of 125 masters-level students in Belgium on elements of gamification similar to digital badges through surveys and focus groups. They noted that students had

mixed reactions to their gamification experiences, with some students finding it demotivating, even though gamification played a significant role in increasing the students' overall achievement, feelings of autonomy, and ability to relate with the class and one another. As a result, Van Roy and Zaman suggested that instructors need to understand how gamification might interact with individual student needs as well as their individual situational and cultural backgrounds.

Gamification Elements Should Include More Than Rewards

As shown by Gerber's (2017) study, gamification needs to offer more than extrinsic rewards. Specifically, gamification works best if it incorporates opportunities to fail, but learn directly from that failure, much like the video games systems on which elements of gamification are based. Gerber suggested that the best gamification systems include feedback loops that encourage experimentation and adaptation. Huang and Yeh (2017) also suggested the need for gamification to go beyond external rewards and noted the success of "meaningful" gamification systems that included opportunities to fail and interconnections between lessons.

While many researchers studied the idea that it was the rewards in gamification that led to increased student engagement, Ab Rahman et al. (2018) suggested that it was the ease of use and familiarity of gamification elements that engage students. Using TAM as its framework, their quantitative experimental study of 50 college-age students in Malaysia corroborated this idea, as the subjects of their study indicated only a mild interest in the points and leaderboard elements of the gamified course, but 90% of them had positive response due to the ease of use that the elements provided in comparison to

courses that did not use gamification. They stressed the importance of keeping gamified elements simple to understand and use.

De-Marcos et al. (2016) also noted that focusing on rewards ignored the greater potential of gamification in education. They examined 379 college-age students in Spain in a quantitative study that compared different types of gamification platforms, which included elements such as achievements, digital badges, leaderboards, levels, and points, to each other, to a platform designed using elements of social networking, and to a traditionally taught control group. They discovered that, while all gamified platforms had a significant impact on student learning, students did better with gamification elements that were tied to specific lessons in the course used and that included social elements.

Different Elements of Gamification Affect Different People in Different Ways

Gamification affects different students differently. Buckley and Doyle (2016) suggested that a major portion of this difference is based on whether students are motivated intrinsically or extrinsically. In their quantitative empirical study, they examined 100 college-age students in Ireland who used a gamification system that involved narrative, points, leaderboards. The study indicated that while there was a positive correlation between gamification and motivation for all students, gamification positively affected intrinsically motivated students more than extrinsically motivated students. In a later study using the same gamification system and empirical design, but a different group of 95 students, they differentiated this further, noting that educators should take care when implementing gamification depending on each student's personality traits (Buckley & Doyle, 2017).

The findings of Buckley and Doyle (2017) were similar to those in other research studies. The study by Barata et al. (2017), described earlier, also examined the need to take student personality traits into account when designing gamification elements. Using quantitative cluster analysis, they identified six different types of students in accordance with their dealings with gamification in a course. Similarly, Zaric and Scepanovic (2018) noted that learning styles played a large difference in how students were affected by gamification in their classes, with active and sequential learners benefitting the most, while intuitive, sensing, and global learners often did better without gamification.

Kocadere and Çağlar (2018) were even more specific in their research, subdividing different elements of gamification and identifying which were found to be effective and which ineffective with different types of learners. For the development of their tools, they used data from 197 college-age students from seven universities in Turkey. They used a mixed-methods study with a quantitative experimental component to design their system and narrow their participant pool to 41 students to use a gamified learning system that incorporated achievements, digital badges, freedom to fail, leaderboards, levels, narrative, and points. Based on a questionnaire, they narrowed the qualitative case study element to interview participants who represented the four learner types they had developed—killer, achiever, explorer, and socializer. Overall, they indicated that the differing responses of their subjects to separate elements of gamification suggests that educators should use a variety of gamification elements to best reach all learners. However, Bai et al. (2020) disagreed with that suggestion, noting that

their meta-analysis of gamification studies indicated that an increase in the types of gamification being used did not have a significant effect on student learning performance.

One cannot simply drop gamification elements into a learning situation and expect them to be successful. The quantitative study by Groening and Binnewies (2019) included a total of 245 participants in Germany from a wide range of age groups as part of three different experiments. These experiments focused on a varying quality of digital badges and other achievements. Their participants noted that the design of these gamification elements directly connects to their effectiveness. In a quantitative case study with a randomized controlled experiment, Lopez and Tucker (2019) focused on the importance of understanding that different aspects of gamification appeal differently to people based on their individual personalities when it comes to playing games. Like Kocadere and Çağlar (2018), Lopez and Tucker focused on six different player types—philanthropists, disruptors, socializers, free spirits, achievers, and players; however, unlike Kocadere and Çağlar, this study only used three gamification elements—achievements, avatars, and points. They used 30 college-age participants from the United States. They found that students benefit more from elements of gamification that are directed to their own play styles.

The concept directing elements of gamification towards particular types of students was emphasized by Aldemir et al. (2018) who noted that due to the varying effects of different aspects of gamification on different people, care must be taken when choosing how and where to implement gamification elements. Their qualitative case study with an experimental element that focused on using the gamification elements of

achievements, digital badges, leaderboards, narrative, and points as well as including elements of challenge, constraints, teams, and win-state on 188 college-age participants. They, too, noted that design makes a large difference in how students perceive the effectiveness of gamification elements. This was further supported by Jagušt et al. (2018) who noted that it is essential to take the age and maturity of the students into account when deciding which elements of gamification to combine. Their quantitative, quasi-experimental study examined 51 elementary students from Croatia and focused on the gamification elements of leaderboards, points, and narrative. They also noted that different combinations of gamification elements had different impacts on student learning depending on the students and the content.

Teachers' Roles in Implementing Gamification

Maican et al. (2016) emphasized that gamification should not entirely supplant current systems of education, but instead educators should carefully incorporate gamification within them. Their quantitative study focused on the usage of gamification platform that used achievements, avatars, digital badges, freedom to fail, leaderboards, levels, narrative, and points. They suggested that educators should not introduce a gamification platform and expect it to handle student needs on its own without monitoring and guidance from the teacher. Şahin and Namli (2016) indicated that the extra effort involved in that monitoring and guidance might deter teachers from including gamification elements in their lessons, but that student achievement and motivation due to gamification make the effort worth the resources that teacher devote to such lessons. The research of Sánchez-Mena and Martí-Parreño (2017) further supported that idea.

They conducted a phenomenological study of 16 higher education teachers who had at least 1 year of experience using gamification and their perceptions about it.

Sailer et al. (2017) note that gamification as a general term is too broad to for researchers to consider it an appropriate focus of research. Based on a framework of self-determination theory, their quantitative experimental study used 419 participants of various ages in Germany who they recruited online. Their study focused on the gamification elements of avatars, digital badges, leaderboards, narratives, and points. They emphasized that researchers must analyze the various elements of gamification when determining why and how those elements should be used. The study by Toda et al. (2020) specifically looked at 21 such elements of gamification and tested a taxonomy for them and their uses. The research also suggested a means for gamifying lessons as well as learning platforms. They indicated that further research needs to be conducted in the effectiveness of how gamification elements are included in educational situations.

Zainuddin et al. (2020) specifically suggested that researchers should conduct studies on the varying roles that technology can play in gamifying lessons. Specifically, they discussed the need for researchers to evaluate gamification in low-tech situations to differentiate gains due to gamification and gains due to new technology. They suggested that finding low-tech ways to achieve similar results with gamification would help in areas that do not have a great deal of access to technology.

Teachers' Uses of and Attitudes Towards Gamification

Bouchrika et al. (2019) saw positive gains not only in student engagement and participation when gamification was incorporated, but an increased interest among

instructors as well. Over their empirical study which used 863 college-age students and 36 educators in Algeria, a growing number of instructors incorporated the gamified platform that the researchers had created. This platform included the gamification elements of achievements, digital badges, leaderboards, and points. While the students the researchers surveyed emphasized the motivational power of the points and leaderboard as driving their engagement, the researchers noted that increased student engagement and the avenues of communication that the gamified platform provided were the primary reasons for adoption by instructors. Similarly, Manganello and Pozzi (2019) noted that gamification increased teachers' positive opinions about the usefulness and ease of use of other types of educational technology. Their quantitative experimental study had 30 college-level educators in Italy as participants and focused on the gamification elements of achievements, digital badges, narrative, and points.

Adukaite et al. (2017) conducted a quantitative study using 209 teachers in South Africa who were given a chance to use a gamified platform that focused on elements of gamification including achievements, digital badges, and points. Based on the questionnaire responses, almost all these teachers perceived the benefits of gamification, but they were primarily concerned with the amount of time that adding gamification elements would take. Following that, the teachers were concerned about student access to technology and the internet. In a mixed methods study of 21 teachers in the United States, An (2018) similarly found that nearly all teachers in the study who are given professional development about using games or gamification in learning commented that it would have a significant impact on their teaching and their students' learning. An's study was

based on an analysis of responses by teachers who participated in a course that explained gamification and game design theory. An noted that many teachers do not implement gamification elements in their courses because they have not received training or information about how to effectively do so.

Methods Used to Study Gamification

Many studies have used quantitative quasi-experimental studies to determine the effectiveness of gamification or various elements of gamification (Dichev & Dicheva, 2017). The studies commonly introduce the element or elements of gamification of interest and compare courses using gamification to either previous iterations of the course which did not use gamification or to control group courses taught synchronously that are not using gamification. Some introduce elements of gamification and compare the results to previous or future units that are taught (Zainuddin et al., 2020).

Qualitative and mixed-methods studies usually include questionnaires near the end of a session or course where gamification has been used to examine the perceptions of the students and teachers about the use of gamification. Other studies are done by introducing teachers, or teachers in training, to elements of gamification either as concepts or directly within their training and then asking about their thoughts and concerns about using gamification in the future. Even the case studies and phenomenological studies only examined the situation after the researchers introduce some element of gamification to the participants (Dichev & Dicheva, 2017; Zainuddin et al., 2020).

Implications for Research

This study filled several gaps described in the literature. Aldemir et al. (2018) expressed that there was a gap in research about gamification elements used in natural settings as opposed to experimental conditions. As part of their reflection, they described the need to examine gamification elements individually rather than as a whole. Oceja and Fernández (2016) also emphasized the need to differentiate between the various types of gamification and the functions that they play. For these reasons, it was important that my study examine gamification elements currently used in Alaskan classrooms while differentiating between different elements in the study as suggested by Landers (2014).

Bai et al. (2020) specifically suggested that future research should examine teachers' feelings and attitudes about gamification. Knowing the extent to which teachers are using digital elements of gamification, as well as their perceptions of gamification's usefulness and ease of use, could inspire other teachers to use these elements (Bouchrika et al., 2019). This could then help teachers better engage students and increase their overall learning.

While using TAM, Pektaş and Kepceoğlu (2019) investigated what prospective teachers thought about gamification and its potential. Their case study introduced gamification elements—including achievements, avatars, freedom to fail, leaderboards, narrative, and points—to their 41 prospective teachers in a university in Turkey over a four-week period. They then examined their participant's views of gamification through a questionnaire and clinical interviews, all of which suggested positive responses to gamification and its possibilities with the one consistent concern that a lack of

technological infrastructure would make implementing gamification elements more difficult. Pektaş and Kepceoğlu specifically noted that similar research should be done at various levels of teaching experience. This highlighted the importance of my study using TAM to examine the perspectives of current teachers about the use of gamification.

García-Jurado et al. (2019) noted that different age groups respond differently to gamification, with younger generations more likely to accept its use more easily. While this should certainly be taken into consideration for students, this needs to be addressed for how teachers adopt gamification as well. García-Jurado et al.'s study focused on consumers, but it noted that older subjects in their study were more likely to use gamification elements that were easier to use even if the perceived usefulness was less. Thus, it was important that my study evaluate Alaskan teachers' beliefs about the PU and PEU of digital elements of gamification when examining the extent to which they are using them.

Summary and Conclusions

In the literature review, I established the positive results that gamification produces in education. The focus then shifted to the research that discussed the effects of gamification on student motivation. Having established how gamification can benefit education in the area of student motivation, I provided literature to indicate that care needs to be taken by educators who use gamification as they must take students' needs and backgrounds into account, use gamification as more than a reward system, and understand that different elements of gamification affect different people in different ways. I then described research that established the roles that teachers should take in

using gamification as well as research that described how teachers have used gamification and their attitudes towards it—which is the focus of this study. This led to a description of methods that researchers have used to study gamification, after which I explained the implications for further research and the basis of this study.

Gamification has a positive impact on student engagement and achievement. Bai et al. (2020) found that gamification had a medium effect on learning performance of 0.504. This is statistically above the typical value of 0.4. Because some studies indicate that not all forms of gamification benefit all students equally (see Aldemir et al., 2018; Barata et al., 2017; Buckley & Doyle, 2017; Jagušt et al., 2018; Lopez & Tucker, 2019; Zaric & Scepanovic, 2018), and that in some cases it can even lead to a negative effect on student achievement (see Buckley & Doyle, 2017; De-Marcos et al., 2016), it is essential that teachers are careful when using gamification in their classes.

Despite researchers such as Nacke and Deterding (2017) claiming that gamification terms were largely settled years ago, there seems to still be a great deal of confusion about what constitutes an element of gamification, let alone how they can be identified. Oceja and Fernández (2016) indicated the need for there to be a greater understanding of gamification elements and their classifications if research is to progress about gamification and its effects on our world. Sailer et al. (2017) emphasized that more research needs to be done on the separate elements that make up the general term of gamification. This confusion, as well as concerns about time, are reasons that some teachers are hesitant to use gamification in their classes despite its positive effects (see Adukaite et al., 2017; An, 2018; Pektaş & Kepceoğlu, 2019).

This study provided a descriptive qualitative multicase study of the Bear School District in Alaska to determine the extent that high school teachers were using digital gamification assets and techniques to handle student isolation and increase student motivation. It also examined those teachers' perceptions about the ease of use and usefulness of these elements of gamification in achieving their goals. This filled both the gap in literature and the gap in practice found in Alaska regarding the use of gamification at the high school level.

Chapter 3: Research Method

The purpose of this qualitative multicase study was to understand the extent to which digital gamification assets and techniques are being used by high school teachers to engage students in the Bear School District in Alaska. I also examined how those teachers perceived the usefulness and ease of use of those elements of gamification in overcoming isolation and improving student motivation (see Scherer et al., 2019). I separated elements of gamification rather than examined gamification as a single concept (see Landers, 2014). By examining the extent that high school teachers are currently using gamification and their perceptions about gamification's various elements, this study provides a better understanding of which gamification elements are worth pursuing and where more training and resources might be necessary.

Research Design and Rationale

As the goal of this study was to examine what practices are already in place, I used the qualitative methodology (see Ravitch & Mittenfelner Carl, 2016). A multicase study design was employed because the participants were derived from the three largest high schools in the district (see Yin, 2012). The following three research questions guided this study:

1. To what extent are digital gamification assets and techniques being used by Alaska high school teachers in their classes in the Bear School District?
2. What are the perceptions of Alaska high school teachers in the Bear School District about the usefulness of digital gamification assets and techniques to overcome student isolation and increase student engagement?

3. What are the perceptions of Alaska high school teachers in the Bear School District about the ease of use of digital gamification assets and techniques in overcoming student isolation and increasing student engagement?

In this study, I triangulated the data collecting using a questionnaire, interviews, and a 2-week journal from the participants. This provided a clear understanding of the extent to which high school teachers in the Bear School District of Alaska were using digital elements of gamification in their day-to-day teaching as well as indicated how the teachers perceive the usefulness and ease of use of digital elements of gamification in increasing student motivation and overcoming isolation.

Role of the Researcher

Ravitch and Mittenfelner Carl (2016) explained the importance of researchers using *criticality* in examining their role as an instrument in qualitative research. This means examining the social structures that surround the researcher and the participants as well as reflecting on any biases that the researcher might have due to them. In this study, I was a teacher who requested responses from other teachers within the same district where I work. I had no position of power over other teachers in the school system at the time of the study but might be known by many of them because I have been vocal at school board meetings and other district events. Not only did I make it clear that there would not be negative repercussions to the participants due to their participation in this study, but I initially used the NVivo software to create word cloud visualizations in the initial coding of the transcripts and journals as a way to avoid personal bias when looking for codes, categories, and themes (see Saldaña, 2016). I also did not collect data from the

high school where I work so that my relationships with my coworkers did not influence the results.

My research instruments included a questionnaire (Appendix A), an interview guide (Appendix B), and a journal template (Appendix C). I contacted the appropriate administrators at the Bear School District, including the superintendent and principals of the schools involved, and sent them the site permission forms provided by Walden University's Institutional Review Board (IRB) to obtain their consent. As a requirement of that process, I completed an Application to Conduct Research form for the school district. Once district administrators and Walden University's IRB granted permission, I sent out the questionnaires as allowed, reviewed the responses received, and contacted the potential participants. Using the interview script, I interviewed the participants and informed them about the use of the journal template. Once I received the information from the questionnaire's responses, transcribed interviews, and journals, I examined them using coding methods to look for significant trends and outliers, collated that information, and presented the findings of the study.

Methodology

I used a qualitative methodology because the purpose of this study was to examine and explain the extent to which an existing system is using digital elements of gamification (see Ravitch & Mittenfelner Carl, 2016). The study focused on examining the extent that Alaskan high school teachers in the Bear School District were using digital gamification assets and techniques. A multicase study design was employed because the study involved multiple teachers from three different schools to examine the extent to

which digital gamification assets and techniques were being used as well as the PEU and PU of assets and techniques (see Yin, 2012). Because care needs to be taken when defining the multiple cases, I focused on the three schools in the Bear School District that exclusively and directly teach high school students. Using different teachers from different schools within the same district provided the study with data that allowed for triangulation between the different sites (see Ravitch & Mittenfelner Carl, 2016).

Additionally, I identified teachers who had demonstrated knowledge and use of gamification at some point in their teaching. This study involved a questionnaire (Appendix A) that was used to gather descriptive information about which Alaskan teachers, particularly within the Bear School District, were using digital gamification assets and techniques. Based on the information provided by teachers in the questionnaires, I selected participants for interviews. Those interviews followed the interview guide located in Appendix B. I gave those teachers whom I interviewed the opportunity to record what digital gamification assets and techniques they were using daily for 2 weeks, following the journal template provided in Appendix C. By using three different types of data sources, the study achieved methodological triangulation (see Ravitch & Mittenfelner Carl, 2016).

Participant Selection

The sources of data were the questionnaires, interviews, and journals of teachers from three high schools in the Bear School District of Alaska, which consists of over 40 schools spread throughout isolated rural villages and several cities. Principals from each of the three largest high schools in the district were contacted directly and asked to fill

out a site permission form so that I had their consent to contact their teachers and for those teachers to participate in this study. I then sent teachers in those schools a link to a questionnaire that, when completed, I used to select teachers who were willing to participate in interviews and journals. The interviews and journals expanded on the first research question and then delved into eliciting the teachers' perceptions about the ease of use and usefulness of digital gamification assets and techniques in overcoming isolation and increasing engagement, which answered the second and third research questions.

Procedures for Recruitment, Participation, and Data Collection

I initially planned to use the purposive sampling strategy of selecting participants based on their responses to the questionnaire link sent to their school email addresses. The email included the Consent Form and a link to the Google Form that I created for the questionnaire. However, due to a lack of interested respondents, I switched my strategy to a convenience sampling of those questionnaire respondents who both indicated that they were willing to take part in an interview and who then set up an interview appointment (see Ravitch & Mittenfelner Carl, 2016). The questionnaire (Appendix A) included information clarifying the nature of the study, the roles of myself as the researcher and the participants, the ways in which the information would be used, how I kept confidentiality, and questions about the participants' willingness to be in the study and current understanding and use of gamification in their teaching. The participants completed their questionnaires online using the Google Form that I had created.

I selected participants based on their willingness to be a part of the study as well as their familiarity with and use of gamification. I notified participants by sending an email to the address they provided on the questionnaire using my Walden University email to help provide confidentiality. This email contained a link to an event invitation on my personal Calendly account. In it, I asked participants to choose a time and day that best fit their schedule.

I selected at least four participants from each of the three schools. Although noting that case studies have no set number of participants or entities needed to make up a case, Yin (2012) stressed the importance of using at least three sources of data for the sake of triangulation. Considering that participants were given the option to leave the study at any time, I felt it was necessary to have at least one additional participant from each school in an attempt to maintain that triangulation. The Zoom platform was used to interview the selected participants. I began the interviews making certain that the participants understood that I was recording the interview, so it could later be transcribed. I reminded them that they could end their participation in the study at any time and that I would remove any data that they provided should they request that I do so. Participants were given the opportunity to look over the transcriptions of their interviews and a summary of my initial analysis of their data so they could provide any corrections or clarifications.

The participants also had the opportunity to fill out a 2-week journal examining their use of digital gamification assets and techniques. This journal covered 2 work weeks during the school year and specifically focused on the digital elements of gamification

used as well as the participant's views about usefulness and ease of use of those elements. I provided willing participants a link to a Microsoft Word document shared on my private Google Drive with a template for the journal that they could edit. Participants were also provided with the option of creating their own document and emailing the journals to me as they completed them. Once they completed their interviews, made any corrections or clarifications on the transcripts, and submitted their journals, the participants could still provide me with any additional information through personal communication.

The questionnaires, interviews, and journals were coded and analyzed for significant trends and outlying pieces of information (see Saldaña, 2016). After coding and analysis, I provided the opportunity for the participants to view the results and allowed for any additional comments, corrections, or clarifications. I considered any additional material provided by participants at this time when reporting the findings of this study.

Instrumentation

In this study, I used questionnaires, interviews, and journals to triangulate the data collected (see Ravitch & Mittenfelner Carl, 2016). Because previously tested tools that suited the needs of this study were not found, I created them and had them reviewed by an expert panel. This expert panel provided suggestions, as noted in Appendix D and Appendix E, that I incorporated into the instruments' designs.

I used the questionnaire (Appendix A) to identify the extent to which high school teachers were aware of and used digital assets and techniques of gamification in their classes. The questionnaire also included questions to determine the willingness of

participants to partake in interviews and journaling for the sake of this study as well as collect their contact information. I only used information from the questionnaire from those responders who agreed to participate in the study.

To ensure consistency in my approach to the interviews, I used the interview script (Appendix B). The script of prepared questions was used in the interviews, but it also left room for off-script commentary and discussion. This type of semistructured interview allows for consistency to lessen the interviewer's bias while still providing opportunities for the subjects to offer information that the researcher may not have considered earlier (Ravitch & Mittenfelner Carl, 2016). I conducted the interviews using the Zoom online application. I took notes during the interviews, recorded the interviews, and transcribed the interviews using NVivo software, whose text-to-speech transcriptions I edited. Participants were aware that the interviews were recorded, transcribed, and used in this study.

The journals used by the participants were based on a template from Appendix C that I provided at the time of their interview. The participants were asked to write journal entries daily over a course of 2 weeks, at which point they submitted the entire journal to me. The journal helped examine the extent to which the teacher used gamification on any given day of instruction, which elements the participant used, and the participant's perceptions of the usefulness or ease of use of each gamification element.

Data Analysis Plan

I designed this study so that each of the instruments built on the information provided by the one before, with each instrument providing context for the next

instrument used. I designed the questionnaire to provide information that would guide the interviews. The interview guide then helped the participants prepare to accurately record their information in the journal. Each of these sources of data worked together to establish a larger picture of the extent to which these participants used elements of gamification and the participants' perceptions about each element's ease of use and usefulness in motivating students in their classes.

The Questionnaires

Beginning with the questionnaire (Appendix A), I asked participants questions that established their familiarity with the concept of gamification, if not the precise term. The participants then answered questions that dealt with six specific elements of gamification, which often take digital form, beginning with an element that I believed would be the most familiar: points. The questionnaire then moved to more complex elements of gamification, culminating in narratives. The participants' answers to the questionnaire gave me my first set of data to analyze for codes, categories, and themes (see Saldaña, 2016).

I used my analysis of the questionnaires to determine which of the participants willing to be part of the interview process were most likely to provide accounts of using various elements of gamification. Because the purpose was to examine the extent to which high school teachers used elements of gamification, the starting possibility was that teachers were using no elements of gamification. Thus, I attempted to recruit participants whose questionnaires indicated that they were as far from that starting possibility as I could find. Specifically, I looked for willing participants whose answers

indicated the greatest familiarity with the greatest number of elements of gamification. Had I needed to be more selective, I was prepared to select participants based on the subjects and grade levels they taught with the intent to collect from a variety rather than have a group that either all taught the same subject or grade level. Unfortunately, as participation was sparce, I used a convenience sample of anyone who was willing to take part in the interview and who chose a time and date that was convenient for them.

Interviews and Journals

I notified the participants selected for the interview by email. I used the interview guide (Appendix B) as well as the participant's completed questionnaire to follow a semistructured interview. Prior to the interview, I reviewed the participant's questionnaire and any other communications I had with the participant so that I was certain to develop a better understanding behind their responses during the interview. As Saldaña (2016) suggested that researchers use digital tools in qualitative analysis, I recorded the interviews using the Zoom platform and transcribed them using NVivo's online transcription application which provided text-to-speech transcriptions that I edited. During the interviews, I took field notes, particularly noting concepts which were apparently important or repeated.

Another purpose of the interviews was to prepare the participants to use the ten-day journal template (Appendix C). Based on the participant's answers on the questionnaire, I determined the participant's familiarity with the six elements of gamification listed in the questionnaire. I used the interview to ensure that all the participants have a consistent understanding of the gamification elements I identified.

This not only provided me with data from the interview but ensured a more consistent and detailed use of the journal template. I informed the participants who agreed to take part in the journal that they were to complete the journal during the next 10 school days and that they were to return the completed journal to me on that 10th day or soon after. As I collected the data, I examined the questionnaires, transcriptions of the interviews, field notes, and journal entries for any errors or places of confusion, writing a short summary of my initial analysis. I then provided my participants the opportunity to review the transcriptions and summaries and make any clarifications or corrections.

From Codes to Themes

When I was satisfied as to the accuracy of the information, I examined the data for repeated terms or phrases that could serve as codes to analyze the information. As part of my analysis, I entered them into word cloud visualization tool in NVivo to look for repetition of key words and phrases which will serve as a second wave of coding. The purpose of using the word cloud in this process was to see which terms the data most repeated that I may have missed on my own when I manually coded the questionnaires, transcripts, and journals. I reviewed the information to look for additional coding and to clarify parts that I have transcribed incorrectly (see Saldaña, 2016).

While manually coding, I used the inductive analysis recommended by Thomas (2006) to identify significant trends and outliers. Inductive analysis requires the researcher to approach the information provided without bias and to instead focus on the themes, trends, and concepts which I identified through the course of the study. This allows the researcher to better describe what is occurring in a case study rather than focus

on what the researcher hopes to find. As part of that, I initially used in vivo coding to keep the data in the same manner as my participants presented it (see Saldaña, 2016).

After manually coding and analyzing the patterns that I established in the data, I organized commonly used words, phrases, and codes into categories. Included in these categories were references to specific elements of gamification as part of Landers' (2014) theory of gamified learning. Following the TAM, I further distinguished the categories from one another by the impression that the participants had of each element's PU in motiving students in their classes as well as the overall PEU of each element (see Scherer et al., 2019). These categories shifted as I examined more codes. The categories changed while patterns and outliers emerged. As I developed the categories, I looked for apparent themes and outliers which best explained the data obtained through this multicase study (see Saldaña, 2016). I outlined and recorded these themes, as I did with the list of codes and categories used to determine them.

Trustworthiness

As I only used a sampling of schools and teachers in this study, it would be difficult to extrapolate what this study will reveal for other teachers, schools, districts, or even states and their educational practices. Instead, this multicase study provided a measure for where this district, and these specific teachers, stood in the extent to which digital elements of gamification were used at the time that the study was conducted (see Yin, 2012). Received questionnaires, interview recordings and transcripts, and journals are available—with any identifying information removed—for examination.

The data itself came from the three instruments of questionnaires, interviews, and journals to triangulate the information provided by the participants. A panel of experts reviewed these instruments. I incorporated many of their suggestions into the current version of the tools. In addition, I provided the participants access to their transcripts and the initial findings of the study with the option of making corrections, clarifications, and additions as needed (see Ravitch & Mittenfelner Carl, 2016). In these ways, the data and the study's findings should be a valid representation of the extent that the participants used digital elements of gamification and their views about its ease of use and usefulness in affecting student motivation.

Ethical Procedures

To ensure that I conducted this study in an ethical manner, no data collection began until Walden University's IRB granted its approval (01-06-21-0623391) based on its review of my proposal. Furthermore, as recommended by Ravitch & Mittenfelner Carl (2016), I asked participants to not use any student names or other identifiers. I also kept individual participant responses and journals confidential in any communications with administrators and in the study itself unless information. The only time that I would have not done so was if the information obtained that suggested a direct threat to someone's wellbeing. The end results used pseudonyms that avoid any identifiers to the actual schools, teachers, or students that might be involved. I kept all confidential information and data including questionnaire responses, recording and transcripts of interviews, journals, and any notes I took in a password-protected file that, following the practice established at Walden University, I will delete 5 years after I completed this study.

Participants could remove themselves from the study at any point prior to the final analysis and presentation of findings. I informed participants of that fact in the opening consent form and questionnaire. I reminded the participants of that option when discussing the transcript and early analysis of their interview. Should a participant have left the study, I would have removed all information pertaining to that participant from the study.

Summary

This qualitative case study followed an embedded multicase study design to determine the extent that high school teachers in the Bear School District of Alaska used digital gamification assets and techniques to motivate their students and overcome isolation. It used a questionnaire to identify possible participants. I interviewed those participants using a specific script and gave them an opportunity to complete a 2-week journal that examined their use of various elements of gamification and their perceptions about the usefulness and ease of use of those elements. I kept the participant's responses confidential and analyzed those responses for significant trends and outliers. I reported the results in this final paper and will make on request the questionnaires, notes, transcripts, recordings, and journals available for examination with identification information removed.

This chapter focused on the research methods used in this study. It began with an explanation of why the study uses a qualitative methodology with a multicase study design. I then explained my roles in crafting materials, finding participants, conducting interviews, collecting journals, and analyzing the data. Following that, the chapter

included a description of the methodology of the study including how I selected my participants, what instrumentation I used, and the plan for analyzing the data. Finally, the chapter included how I planned to address issues of trustworthiness and ethical procedures. Chapter 4 focuses on the actual data collection and analysis for this multicase study.

Chapter 4: Results

The purpose of this qualitative multicase study was to understand the extent to which digital gamification assets and techniques were used by high school teachers to engage students in the Bear School District in Alaska. I also examined how teachers in three of the Bear School District's high schools perceived the usefulness and ease of use of those elements of gamification in overcoming isolation and improving student motivation (see Scherer et al., 2019). Because in the theory of gamified learning, Landers (2014) posited that individual elements of gamification must be examined separately from one another rather than as a single concept, I specifically asked these teachers for separate information about the gamification elements of points, leaderboards, achievements, avatars, freedom to fail, and narratives.

The research questions were:

1. To what extent are digital gamification assets and techniques being used by Alaska high school teachers in their classes in the Bear School District?
2. What are the perceptions of Alaska high school teachers in the Bear School District about the usefulness of digital gamification assets and techniques to overcome student isolation and increase student engagement?
3. What are the perceptions of Alaska high school teachers in the Bear School District about the ease of use of digital gamification assets and techniques in overcoming student isolation and increasing student engagement?

In this chapter, I describe the setting for this study and the data collection process. The chapter also contains an explanation of the proceduresused for data analysis and the

results that analysis provided. I then provide the evidence of trustworthiness before concluding with a summary of the chapter.

Setting

In this multicase study, I focused on three high schools within the Bear School District in Alaska. The Bear School District encompasses 25,000 square miles, making it geographically larger than 10 states; however, it only includes approximately 9,000 students from prekindergarten through the 12th grade with approximately 650 certified staff members. Both students and staff are primarily White, with 11% of students being Alaskan Native. Of its 44 schools, only four are specifically listed as high schools, with seven more that include Grades 7–12, and 15 others that serve students prekindergarten–12. The Bear School District also serves many students through a distance learning department and through a homeschooling program.

Because the focus of this doctoral study was on high school teachers, I limited the scope to only those schools that only served students in Grades 9-12. However, throughout the duration of this study, I was employed by the largest of those four high schools. To reduce any conflict of interest and increase the study's trustworthiness, I focused on a multicase study that involved the three remaining high schools rather than a broader single case study of the high schools in the district. To help maintain confidentiality, I referred to these schools with the pseudonyms of Polar Bear High School, Grizzly Bear High School, and Black Bear High School. All three schools are connected to the main population of the state by the road system and serve students in Grades 9–12.

Table 1

Participants

Location	Received Participation Invitation	Answered Questionnaire	Interviewed	Completed Journal Total/Partial
Polar Bear High School	39	15	5	2/0
Grizzly Bear High School	33	13	5	0/1
Black Bear High School	15	6	4	1/1
Total participants	77	34	14	3/2

Polar Bear High School is the largest of the three high schools with 39 certified staff at the time of the study. Close to the central portion of the road system in its region, the surrounding community is not as isolated as the communities around the other two high schools. It still serves a population that can vary greatly depending on the season, with families entering and leaving the area from year to year and throughout the school year. Although it sometimes shares services with the larger nearby high school where I work, none of the participants currently work directly with me, and only one knew me personally because I had taught one of their children and was present when the participant worked at my school as a student teacher.

Grizzly Bear High School had 33 certified staff at the time of the study. The surrounding community is relatively isolated because it is at the end of its road system; although, the community is also a port for the local ferry system. Grizzly Bear High School deals with a larger number of students who are on alternate schedules or who have more itinerant lifestyles.

Black Bear High School is the smallest of the three school with 15 certified staff at the time of the study. Although in a different area, its community is also at the end of

its road system and a port for the local ferry system. With an economy heavily influenced by the summer tourist industry, the community has a smaller group of permanent residents than the other two communities. It, too, serves transient and itinerant students.

This study also took place during the COVID-19 pandemic. For most of the semester prior to the beginning of this multicase study, high school teachers in the Bear School District were teaching their students remotely. The exception was for teachers of intensive needs students who were still teaching in-person, albeit with enhanced safety precautions. Following winter break and just a few weeks before this study began, all three of the high schools involved in this multicase study had moved to a hybrid, in-person and remote learning system using alternating days and student cohorts. On the week I began this study, district administration informed staff that they would return to full-time, in-person learning for all students who wished it, while students could still choose to participate in their classes remotely if they were unwilling or unable to do so in person.

Data Collection

On January 20, 2021, I received permission from Walden University's IRB to begin the study. I immediately sent out an email to the principals of the three schools involved and the superintendent of Bear School District stating that I was going to use the district's email system to send an introductory email to all teachers in those schools at the conclusion of the following school day. While I had received permission from each of these administrators earlier, I asked that they reply before the end of the day if there any reason why they did not want me to conduct the study. I only received positive responses

of encouragement from the administrators who did respond, so on the evening of January 21st, a Thursday, I sent out my introductory email to the teachers at Polar Bear High School, Grizzly Bear High School, and Black Bear High School using the aggregated lists for each school provided by the district.

In the introductory email, I introduced myself and my study, provided an explanation about my use of my district email for general communication and my Walden University email for direct conversations, acknowledged the difficult situation that the COVID-19 pandemic had placed us in, and pasted the entirety of the approved consent form.The consent form included a link to a Google Form created in my personal Google account that housed the questionnaire (see Appendix A). Because I sent the email at 9:55 p.m., I did not expect any responses until the following day. On Friday morning, January 21st, the district informed its teachers that they would be moving from the hybrid model of instruction to every-day, in-person instruction with the option for students to take part remotely. I did not receive any responses.

Questionnaire Collection and Usage

On January 27th, after consulting with my committee chair, I sent an email to the principals of the three school asking if they could make certain that their teachers had received my introductory email. One of the principals asked if I could wait a couple of weeks before sending out further inquiries. I informed all three principals that I would do so. On February 8th, I received my first questionnaire response from a participant who declined to take part in an interview. The Google Form sent participants' questionnaire responses automatically to a Google Sheet where I could examine the provided

information. I color coded the Google Sheet based on who wanted to interview and who had interviewed, as shown in Figure 1. I copied each participant's responses from the Google Sheet into individual Word documents prior to their interviews or at the end of the information-gathering portion of the study on May 6th if the participant did not take part in an interview. I stored the files in a password-protected folder and uploaded them to NVivo for analysis.

Figure 1

Image of Color-Coded Responses

	A	B	C	D	E	F	G
1	Timestamp	1 Name	2 School where you work:	1 How familiar are you wi	2 What role(s) do you be	3 To what extent do you use games or	4 How useful do you feel games or elements of games are in motivating st
2	2/16/2021 8:36:17	B01	Black Bear High School - Distance Learning	Medium	Depending on the teacher	At this point, I use games as parts of m	Totally depends on the student. When I was a "live" face to face teacher, I
3	3/5/2021 8:04:35	B02	Black Bear High School	Not at all familiar with the	I think that there has also	I will use Scrabble once every two week	They love Scrabble Days. Students like the fact that they are not on a con
4	3/25/2021 12:24:39	B03	Black Bear High School - Distance Learning	Somewhat	They can engage student	Rarely use them, but found success in	Not applicable
5	4/6/2021 8:53:30	B04	Black Bear High School - Distance Learning	Very, I attended a high sc	I think that they can play	I used to quiz students using gamificatio	Extremely! I have used more traditional games like trash-ball, and games li
6	4/20/2021 8:09:14	B05	Black Bear High School	Somewhat	Significant if used efficien	I currently don't use them	N/A
7	4/20/2021 20:34:54	B06	Black Bear High School	I can imagine the meanin	A lot!! Engagement for sur	I use Kahoot on a regular basis. I have s	Very important in motivating students.
8	2/8/2021 8:18:11	GB1	Grizzly Bear High School - SE	somewhat	I think games can be hug	This year, I honestly haven't used it muc	I think the games get students excited and engaged. It sparks the use of s
9	2/16/2021 8:19:37	GB2	Grizzly Bear High School	not very	Big role	I use games every day. We use them fo	Very useful
10	2/16/2021 9:39:51	GB3	Grizzly Bear High School	general familiarity	Gamification can play a s	I will very occasionally use games.	Minimal
11	2/16/2021 10:06:13	GB4	Grizzly Bear High School - Distance Learning	Very. I understand that in	Cooperation, patience, co	Currently I have put together supportive	Huge. While I was a classroom teach we did game day Fridays in which I h
12	2/16/2021 11:38:34	GB5	Grizzly Bear High School	limited	I would like to learn more	I do a weekly contest with the New York	Lots of kids love competition.
13	2/17/2021 13:14:13	GB6	Grizzly Bear High School	Not at all	I do use games in my cla	Once a week instead of quizzes	I know my students love to paly games and don't think of it as learning ever
14	3/24/2021 21:59:41	GB7	Grizzly Bear High School	Not very	I use them for review	Usually just for review	Somewhat, if rewards (candy, stickers, etc) are offered.
15	3/25/2021 11:14:20	GB8	Grizzly Bear High School	Very familiar	I think that games are a g	I use them occasionally for parts of unit	Just like any teaching tool, try to mix it up and use different strategies.
16	4/20/2021 9:58:01	GB9	Grizzly Bear High School	A little. I read about it las	Kids love games. I think it	I don't use games. Well, maybe I have.	Since, I've never used games or the elements of games in my time with cla
17	4/27/2021 8:24:04	GB10	Grizzly Bear High School	Somewhat familiar	I think students respond s	I use them mostly for review. I would lov	The motivation is very high. Surprisingly high.
18	4/27/2021 8:38:45	GB11	Grizzly Bear High School - SE	none	Lots! Kids love gaming	I don't use any	I use competition but not so much gaming. classes I push into do
19	4/27/2021 8:41:27	GB12	Grizzly Bear High School - SE	not familiar with it	games are great as a spe	no games	I do not know
20	4/29/2021 21:53:07	GB13	Grizzly Bear High School	Quite	It has a place	Often for review in History class, and for	Seems to be helpful
21	2/16/2021 7:33:54	PB1	Polar Bear High School - SE	relatively	holds attention	Not really. I support other teachers' curri	Used correctly, students respond very well: attention, focus, and effort can
22	2/16/2021 8:40:52	PB2	Polar Bear High School - SE	not at all	I think it could be good for	I've tried using it for Math but it was part	I think they are very motivating
23	2/16/2021 10:07:33	PB3	Polar Bear High School - SE	I am familiar with gamifica	Games can be used to te	games vary. Sometimes they are teach	Students enjoy games. They are trained in electronic "games" from the tin
24	3/7/2021 20:41:04	PB4	Polar Bear High School - SE	Your explanation in the ex	Games/game elements c	I frequently use tokens as progress mor	Games/elements can be very motivating, so long as the reward is one the s
25	4/20/2021 8:07:05	PB5	Polar Bear High School	Using gaming platforms a	It is a necessary tool, esp	Music performance- memorization of tec	Maybe once a week on the high school level. I used them almost daily in e
26	4/20/2021 8:14:57	PB6	Polar Bear High School	Not Very. I assume it is	Motivation or interest for s	Probability in Geometry, do not use it or	Good motivator if they are interested in the game. at high school level the
27	4/20/2021 8:18:07	PB7	Polar Bear High School	on a scale of one to ten,	they can play a role, yes	part of a unit	depending on the subject, valuable
28	4/21/2021 10:09:37	PB8	Polar Bear High School	I have never heard of the t	Games are good for revie	I use them for review.	Very useful if the students actually participate and are not worried about th
29	4/27/2021 7:22:12	PB9	Polar Bear High School	Not at all.	I think it is important to in	I usually use them as a form of review. \	Essential.
30	4/27/2021 7:43:47	PB10	Polar Bear High School	know a little bit	engagement and dedicati	use kahoot for exit tickets on lessons	I think it can be beneficial if it relates to the learning goals
31	4/27/2021 7:53:12	PB11	Polar Bear High School	somewhat familiar	they can be handy to use	I use them occasionally, but not as muc	they can be motivating if used correctly, sometimes it is a nice break or re
32	4/27/2021 8:09:35	PB12	Polar Bear High School - Distance Learning	I have a general understar	I believe they play an imp	I use them frequently with the code.org c	I think games are extremely motivating to students, that is why I'm trying to
33	4/27/2021 10:15:53	PB-null	Polar Bear High School - Admin	A bit.	A lot! Quizlet, kahoot, bra	I use them as a check for understanding	Extremely useful! I mean, they are kids, kids like games
34	4/27/2021 15:36:51	PB13	Polar Bear High School	Not particularly familiar at	Well, there's certainly a pl	I do Jeopardy! trivia games and have dis	Depends on the game, but I definitely believe in the power of play.
35	4/29/2021 8:02:26	PB14	Polar Bear High School - SE	Not very much - I use gan	I think they are helpful to t	I tend to use them for review purposes o	I think games can be very motivating as long as its varied - doing the same
36	5/6/2021 10:03:13	PB15	Polar Bear High School	I am only slightly familiar	I believe that it can an imp	I will sometimes use them during sectio	They can be useful to get students engaged
37	Did not schedule an interview						
38	Declined to interview						
39	Interviewed						

Note. I removed or changed the names and other identifiers of the schools and participants.

On February 15th, I sent a reminder email to the teachers at all three schools. I included a paragraph explaining that I had not yet reached the number of participants needed for this study and encouraging teachers to participate even if they did not believe they had much to say about gamification. In the following 2 days, I received nine

responses, with eight of them indicating that the participants were willing to set up an interview. Using my Walden University email account, I sent those participants individual invitations to a Calendly event that I created from a personal Calendly account. This online scheduler showed the participants times that I was available, set in 15-minute intervals. Participants could choose the date and time that worked best for them; doing so would automatically create an hour-long Zoom meeting at the time they requested, notify me and the participant of the event via email, and automatically place the event on my personal calendar with an alarm set for an hour before the meeting. I used a personal Zoom account to set up these online meetings.

My original intention was to use the questionnaires to select interviewees so that I would have a variety of participants across various subject areas and levels of teaching experience. However, due to the lack of respondents, I sent nearly every participant who stated their interest for an interview the Calendly invitation. The only exception was when one of the principals, whom I know personally, requested an interview. Because I was focusing on teachers in the Bear School District who specifically taught students in their school this school year, I politely declined that principal's request, explaining my reasons.

Conducting Interviews

I held my first interviews on February 25th. I used my personal Zoom account to host the interviews. On my end, to ensure confidentiality, I situated myself in my personal office at home. My computer monitors face away from my office's entrance and any windows. I kept my office door closed for each of the interviews and locked the door

when I remembered to do so. I recorded each of the interviews, downloading the audio files to my personal computer and transferring those files from their default location to a password-protected folder on my personal computer. From there, I uploaded the audio recordings to my copy of the NVivo software. I then used my NVivo subscription to transcribe the interviews. Due to some issues that I had with working the NVivo software, I had to download separate files for the first three interviews that I recorded before placing them in the secure folder and the NVivo program.

Prior to each interview, I created a Word document that contained the interviewee's responses to the questionnaire, saving the document in the same password-protected folder and uploading it to NVivo for further analysis. I used that document to review the participant's responses before the interview and as a reference during the interview. I also created a Word document as a copy of the Interview Guide (Appendix B). This document was used to type notes into as I conducted the interview, using a red font for the notes I took to distinguish them from the rest of the guide. Finally, a Google Doc was created for each interviewee to use as a journal should they have chosen to participate in that portion of the study. I copied and pasted the Journal Template (Appendix C) into the document. The "share" permissions for the journal were opened to anyone with the link until the end of the study so that participants could write directly in it if they chose rather than creating a separate file and emailing it to me.

Although the Zoom app could automatically record scheduled meetings, I elected to manually start and end each recording, giving the interviewee a warning before I did so. I did this to make certain that I had the correct interviewee, attempt to fix any

technical issues that may have occurred, and deal with off-topic small talk. In a few cases, I continued to speak with interviewees about issues that were not directly related to the study after I stopped the recording. In only one instance did an interviewee and I converse about information relevant to the study before I started recording. In that situation, I asked the interviewee to repeat some of the ideas that we had discussed once I started the recording.

Using the Interview Guide (Appendix B) as a reference, I conducted each interview in a similar, if often paraphrased, manner. One deviation made based on the first interview was that I gave an explanation and examples of gamification and each of the six elements of gamification even if the participant's questionnaire indicated that the participant was familiar with them. Based on the participants' reactions and facial expressions, I would go into either more or less depth with my explanation and examples until I was relatively certain the interviewee understood what the terms meant. The document created with the participant's questionnaire responses was used as an additional reference, and I took notes in the document I created earlier based on the Interview Guide.

At the end of each interview, before thanking the interviewee, I asked if they could provide me with the names from anyone else in their high school who might have been willing to participate in the study. Those identified individuals, in addition to names provided by the building principals, were sent direct email invitations, whether they had already participated or not, using the BCC function in the district's email to provide confidentiality. In these email messages, I did not say who recommended them for the

study. Most of the names provided over the course of the study were of teachers who had already participated by the time I received their names, and the rest did not respond, so the snowball sampling effort had a negligible impact on the study.

10-Day Journal Collection

I asked the interviewees if they were willing to participate in a 10-day journal to provide further data for my study. If they agreed, I emailed them the link for the individual Google Doc journal templates that I created prior to the interview. I informed them that the link led to a document that anyone with the link could edit, and that they could create their own journal following the template and send that document to me if they chose to do so. None of the participants created their own journal documents.

Of the nine participants who agreed to complete the journals only three did so completely while two submitted partially completed journals. I sent email reminders to those who agreed to complete the journals. A few of them responded to apologize and say that the school year had been too overwhelming for them to complete the journals. When I closed the data collection portion of the study on May 20th, I removed the "share" permissions from the journals, downloaded each journal as a Microsoft Word document into the password-protected folder, and uploaded those files to the NVivo application for analysis.

Extended Data Collection Process

Because I only had 10 questionnaire responses and two interviews by the end of the third quarter of the school year, I sent another reminder email on March 4th to the teachers in the three high schools. In addition to the standard information about the study,

I gave a general thank you, without any identifying information, to those who had already responded to the questionnaires and to those who had participated in the interviews. In response, one of the participants who had indicated interest in taking part in an interview mentioned that they did not see an email from me regarding scheduling an interview. Through email correspondence, we discovered that the participant's spam filter had sent my email to the participant's Junk E-mail folder automatically. For this reason, I sent a follow up email on March 6th, indicating that anyone who had expressed interest in taking part in an interview with me should check their spam filters or send an email directly to my Walden University email account. This provided four more interviews and two more questionnaire responses.

On March 24th, I sent another general email reminder as well as more direct invitations based on recommendations. As this request only brought three more questionnaire responses, I sent another email on April 5th. In this email, I continued to include the Consent Form and the link, but instead of describing the study in the body of the email, I began it with the word "Please" and provided numbers of questionnaires and interviews that I would still like to have from each school based upon discussions with my committee chair about how many participants I would need to establish validity. From that point, I sent reminder emails with the updated numbers on April 11th and April 20th. Combined, these brought my eight more questionnaire responses and three more interviews.

I changed the content of the general email that I sent on April 26th to emphasize the amount of time and effort that I had put into this study so far and my concern that I

would not have enough data to create a valid study. I included updated figures for the numbers of questionnaires and interviews that I would still need. This led to 11 more applicable questionnaire responses—plus one response from an administrator that I did not include, as mentioned earlier—and five more interviews, including two from participants who had earlier declined the opportunity to interview. As each high school met the quota I had established, I sent that school's teachers a group email thanking them for their help and promising to let them know the results once I concluded my study.

On May 5th, I conducted my final interview as the last day of school in the district was May 19th, and I wanted to give the possibility of completing the 10-Day Journal to anyone who interviewed. I had forgotten to close my questionnaire, so I received a final response on May 6th. At this point, I converted the Google Sheet containing all the questionnaire responses into an Excel sheet and downloaded it to the password-protected folder. Note Figure 1 in the Questionnaire Collection and Usage subsection of this chapter. I continued to email participants who had agreed to complete their journals as I noted above, but I finally closed the data collection portion of my study on May 20th by removing the "share" permissions on the 10-Day Journals.

Polar Bear High School's 39 teachers provided me with 15 questionnaire responses, five interviews, and two completed journals. Grizzly Bear High School's 33 teachers provided me with 13 questionnaire responses, five interviews, and one partially completed journal. Black Bear High School's 15 teachers provided me with six questionnaires, four interviews, one completed journal, and one partially completed journal. Note Table 1 in the Setting section of this chapter.

Data Analysis

My analysis began with the reception of the first questionnaire response on February 8th. Once I accessed my home computer, I reviewed the participants responses, mentally noting which gamification elements the participant wrote about, what digital resources the participant mentioned using, the participant's views on the usefulness of both gamification and its specific elements in motivating students, and the participant's views about the ease of use of both gamification and the specific elements mentioned in the questionnaire. I then color coded the row in the Google Sheet containing the data based on the participant's interest in the interview portion of the study. I followed a similar pattern for every questionnaire response that I received. By the end of my data collection, I uploaded each participant's set of responses into the NVivo application for coding as described later.

During each interview, I took notes on a separate copy of the Interview Guide (Appendix B) for each interviewee. I recorded any impressions or ideas that I felt were interesting or important to my study as the interviewees provided their information. Reviewing these notes provided me with a basic understanding of the trends I noticed, focused some of my later coding, and provided a basis for the paragraph summaries that I would later provide the interviewees for validation purposes.

I uploaded the Zoom platform's audio recordings of the interviews to the NVivo applicaiton. I then used the software to upload each file to NVivo's online transcription application. For the first three interviews, I then unwittingly imported the original transcription that the online text-to-speech application provided, not realizing how

difficult it would be to edit in the main program. For these first three interviews, I returned to the online transcription application and edited them so that they properly represented the discussion. I then attempted to import them into the audio files on NVivo but was unable to do so. For these three interviews, I download a text file of the transcriptions and uploaded them as separate files to NVivo. For the rest of the interviews, I was able to edit the transcription on the online application and then import them directly to the audio files in NVivo. While transcribing, I mentally noted trends and themes that I wanted to later review when coding.

As I completed my editing of each transcript, I wrote a paragraph for each transcript that summarized my impressions and preliminary analysis of what the interviewee had said based on their transcripts and the notes I had taken. I then individually emailed each interviewee with my paragraph summary of our conversation and a copy of the transcript. I asked the participants to review my summaries and the transcripts. If they had any concerns or wanted to provide any clarifications, I asked that they send those to me by May 26th. I sent the last of those emails out on May 20th. I received five responses, including one on May 27th. Aside from one respondent's concern about grammar and vocal ticks, all the responses stated that the participants felt the transcripts and my summaries adequately represented them.

In the NVivo application, I created a separate case for each participant and moved the files associated with their questionnaire responses, interviews and transcripts, and journals into those cases. I also created a separate case for each of the three high schools and placed the participant cases within the case for high school where they worked. As I

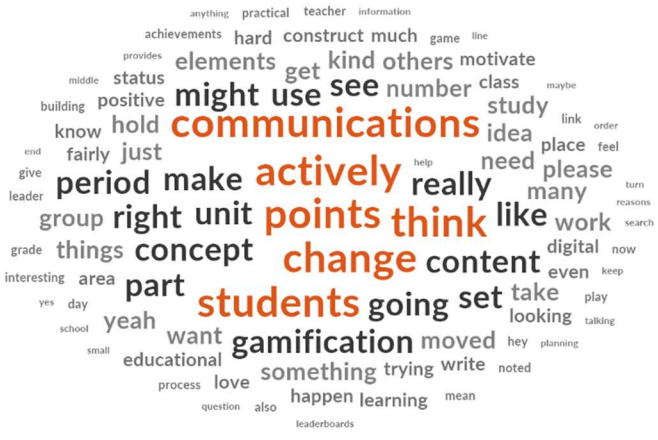
was familiar with each of the participants through the information they provided, this process gave me a general sense of what trends and themes the schools had in common and where some of the outliers were.

Coding

Once I had uploaded a transcript, I used the NVivo applicaiton's word cloud visualization feature to gain an idea of the main words or phrases used during the interview to find some preliminary codes as suggested by Saldaña (2016). I did not find the process helpful as the results were too disassociated from their meaning for me to use them as codes. Despite the overall lack of usefulness, I still ran a word cloud visualization for every transcript as they still revealed the most frequent words used in the interviews. Figure 2 is an example of the type of word cloud that the NVivo application provided.

Figure 2

Word Cloud of BB3's Interview



After I uploaded files to NVivo and assigned them to the proper cases, I began line-by-line in vivo coding of each file. My original plan was to use descriptive coding,

but Saldaña (2016) specifically warned against doing that for case studies and instead suggested using in vivo coding to create a more authentic picture of each case. Saldaña also suggested line-by-line coding rather than holistic coding for inexperienced researchers. I followed that suggestion for most of the data provided, but used holistic coding when dealing with often-repeated or slightly off-topic information. I did not code any of the portions of the interviews that were completely off-topic. I primarily coded words or phrases that dealt with the ways gamification the respondents were using gamification, the perceived usefulness of those elements, the perceived ease of use of those elements, and anything that the respondents believed would help in their use of gamification. I struggled with finding in vivo codes that were not too long to be manageable yet still able to encapsulate the essence of the participants' information. This yielded over 580 codes for the 14 interviews, 34 questionnaires, and five journals.

Creating Categories

Based on my research questions, conceptual frameworks, and my initial impressions from my readings of the questionnaire responses, my notes, and my transcription editing, I created five primary categories in which to organize my codes and search for themes. I titled the file Thematic Framework, and copied the codes into the file before I created the categories of Gamification Positives, Gamification Negatives, Gamification Tools, What Teachers Want in or for Gamification, and Gamification Elements as shown in Figure 3. I further subdivided Gamification Elements into Achievements, Avatars, Freedom to Fail, Leaderboards, Narratives, Other Element Used, and Points as shown in Figure 4. Within each of those subdivisions I then created the

categories of Ease of Use, Not Useful, and Useful. Figure 5 is an example of these division within the subcategory Achievements. I sorted each code into the category which I believed was the most relevant. For codes that were equally relevant to multiple categories, I copied them and placed them into each category, creating a total of 685 codes.

Figure 3

Five Primary Categories of Codes

Figure 4

Subdivision of the Category of Gamification Elements

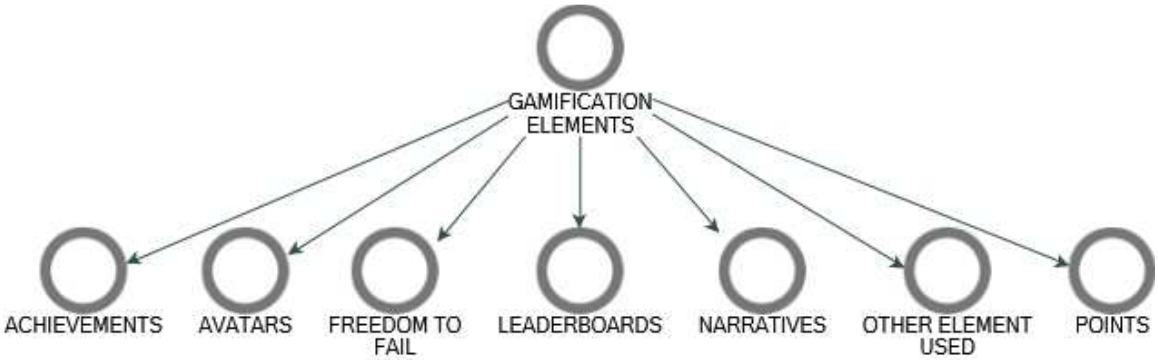
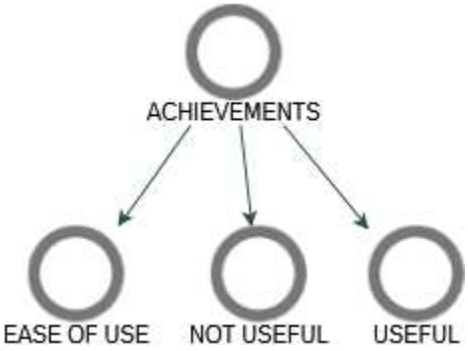


Figure 5

Subdivision of the Subcategory of Achievements



The categories of Gamification Positives and Gamification Negatives were catchall categories that I used for answering all three of my research questions, but particularly for the second research question: What are the perceptions of Alaska high school teachers in the Bear School District about the usefulness of digital gamification assets and techniques to overcome student isolation and increase student engagement? I did not subdivide them into Ease of Use, Not Useful, and Useful as I did for the latter Gamification Elements subcategories because I wanted to place within them codes that gave a larger, overall picture of the three high schools, as Yin (2012) suggested researchers do with case studies. When placing codes into these categories, I occasionally noticed that I could view some of them as both a positive and a negative. I copied and placed these codes into both categories. Meanwhile, I avoided placing codes into either of these primary categories that I could connect to a specific gamification element, and instead placed them into the appropriate subcategory under Gamification Elements.

I created the primary category of Gamification Tools to help answer my first research question: To what extent are digital gamification assets and techniques being

used by Alaska high school teachers in their classes in the Bear School District? As the question focuses on digital gamification assets and techniques, I only placed codes in this category that referred to digital gamification tools. I placed codes concerning gamification assets or techniques that were not digital into the subcategory of Other Element Used or into the specific Gamification Elements subcategory under Ease of Use if it pertained to one of the six elements that I predetermined.

When designing my Interview Guide found in Appendix B, I specifically included the questions "What are some ways that you might want to use gamification in the future?" under B.3.c. and "What do you feel might help make implementing gamification in your classes easier?" under B.5.c. to help answer the third research question: What are the perceptions of Alaska high school teachers in the Bear School District about the ease of use of digital gamification assets and techniques in overcoming student isolation and increasing student engagement? One of the assertions of Scherer et al.'s (2019) use of the TAM created by Davis (1989) is that if teachers believe a technology is useful, but are not using it, then there is likely a problem with the ease that the technology can be used. Thus, I wanted information about what teachers still felt that they needed so that I could determine what was currently not working due to not being easy to use. While answers to these questions also provided codes for Gamification Positives and Gamification Negatives, I placed most of the codes from those responses into this category.

Because Landers' (2014) theory of gamified learning emphasized the need to evaluate elements of gamification separate from one another, I designed my questionnaire and interview questions to highlight six of those elements: achievements, avatars,

freedom to fail, leaderboards, narratives, and points. I created the primary category of Gamification Elements with subcategories for each of the six elements so I could place codes tied to the specific elements in the proper subcategories. I further divided those categories following the ideas of perceived usefulness and perceived ease of use from TAM (see Davis, 1989). To better organize the information, I separated perceived usefulness into Not Useful and Useful categories. I then placed codes that focused on a specific gamification element into the proper subcategory based on its content. I placed codes which dealt with specific uses of these gamification elements but were not necessary tied to digital tools into the Ease of Use category for the appropriate element. Other Element Used was the category I used to place codes that were not directly linked to one of the specific gamification elements listed. I copied codes that connected to more than one element and placed them into each appropriate category.

Organizing Codes Within Categories

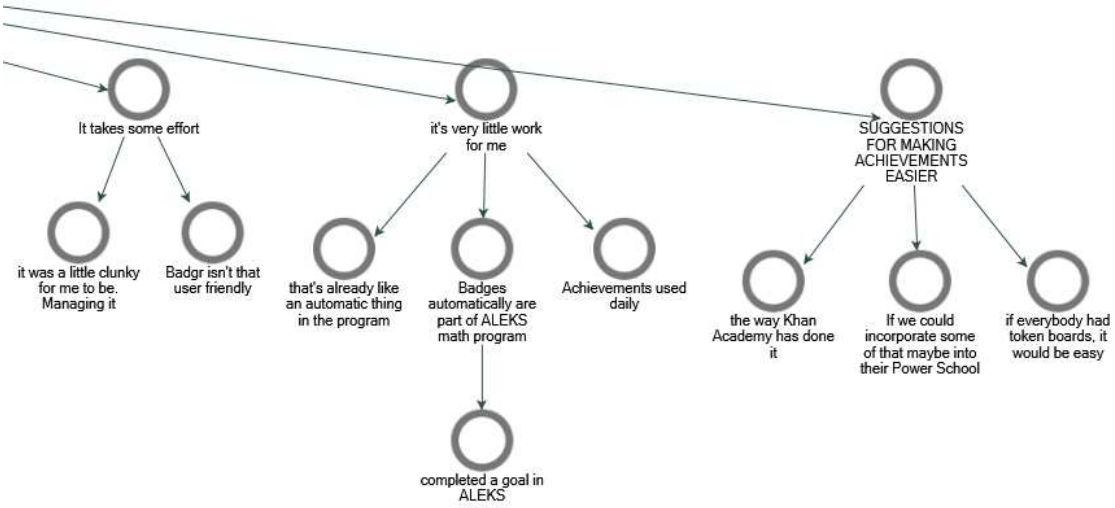
As I now had the codes grouped into more manageable numbers within the categories, I revisited those codes to connect them by idea. Rather than merge codes together in NVivo, I placed the codes in a hierarchy with the code that I felt was the best description of an overall idea on top. In this way, I organized the codes by their subjects, but was still able to see the underlying codes. On occasion, I would find that I had misplaced a code into the wrong category and would then move it into the correct one. As I continued to organize codes in this manner, I would sometimes need to reorder the hierarchy I established to better represent the underlying codes.

In Gamification Tools I organized codes together that mentioned the same digital tool. For Gamification Positives and Gamification Negatives I organized the codes by the various reasons that the teachers found gamification motivating or not motivating for students and reasons why the teachers found gamification useful or difficult to use. In What Teachers Want in or for Gamification I organized together groups of codes that shared similar information regarding what these participants wanted to see from the district, from students, from other educators, or from programmers or innovators.

Within Gamification Elements I placed the codes into the appropriate element and then further separated them based on Ease of Use, Not Useful, and Useful subcategories. In Ease of Use, I grouped the codes based on how the participants used that element of gamification, the issues that made that element of gamification easier or more difficult to use, and suggestions for making that element easier to use in the future. Appendix F provides a visual representation of this organization for the Ease of Use subcategory under the Achievements category with Figure 6 focusing on closer to the far right. For both the Not Useful and Useful categories, I grouped the codes based on similar information or ideas.

Figure 6

Close View of Codes Organized Under "Achievements: Ease of Use"



I used these grouped codes to create a codebook that showed the pattern of information collected based on the hierarchy of codes. I used the hierarchy I set up in NVivo to note which categories and groups had a larger number of responses and which stood on their own. These categories and codes indicated specific themes and trends as well as providing instances of outliers. I provided this information in the Results section of this chapter.

Using the Questionnaire Response Spreadsheet

Although I used line-by-line coding for the questionnaires, interview transcripts, and journals, I did not code the yes and no responses provided by my participants in reference to the specific gamification elements that they believed they did or did not use. In most cases, the duplicated responses within the interviews provided this information. However, to ensure that I did not misrepresent any of the schools or the individual participants, I used to the questionnaire response spreadsheet, organized by school, to

look for any other trends, themes, or outliers that I missed. I added information from the interviews to the spreadsheet when information from the participants' interviews differed from the responses they provided on their questionnaires. When pertinent, I included this information in the Results section of this chapter.

Analyzing the Separate Cases

Unfortunately, I did not understand how to easily use NVivo to aggregate based on the three high schools the categories and codes I collected. Instead, I selected every category and code grouping I had created and then individually ran a query of what cases used those codes. Appendix G is an example of the results of such a query run on the Useful subcategory of the Achievements category. Figure 7 focuses closer on the bottom right of Appendix G for clarity. As participants from all three schools used most of the categories and code groupings, I noted a general consistency between the three schools and their teachers' views on gamification. However, there were outliers, and I mentioned those specific instances in the Results section of this chapter.

Figure 7

Close View of Cases Query for Achievements: Useful

Results

I discovered more similarities than differences between the three high schools, likely because they all operate within the same school district with access to similar technology and training. For this reason, I organized the following results based on the research questions rather than the individual cases, noting the overall trends and themes that I found within all three schools first and then reflecting on the outliers in the specific cases. Within each research question, I further subdivided between gamification as a whole and the six specific elements of gamification that I focused on: achievements, avatars, freedom to fail, leaderboards, narratives, and points.

Use of Digital Gamification Assets and Techniques

Teachers in the Bear School District were using digital elements of gamification, often without realizing it. However, very few teachers were using educational programs specifically designed with gamification elements on a large scale in their teaching. In a few cases, the participants expressed interest in using programs such as Minecraft EDU or Classcraft, but indicated a lack of understanding about how to do so or a concern that the programs were too complicated for them to manage without more help. Similarly, teachers from all three schools indicated interest in knowing how to better leverage the Bear School District's learning management system, Canvas, to incorporate more elements of gamification in their teaching. Table 2 shows the reported extent to which the participants used an element of gamification, a digital asset for gamification, or a defined gamification system.

Table 2

Extent of Use of Gamification Assets and Techniques

Location	Defined Gamification System	Digital Asset for Gamification	Element of Gamification	Did Not Use Gamification
Polar Bear High School	1	10(12)	14(15)	1(0)
Grizzly Bear High School	0	6(9)	11(12)	2(1)
Black Bear High School	0	3(5)	5	1
Total participants	1	19(26)	30(32)	4(2)

Note. The numbers on the left of each column are from questionnaire responses. Some participants whom I interviewed provided information that changed the totals from the questionnaires. If there was a change, I provided the new number in parentheses.

The most frequently used digital applications were the PowerSchool and Canvas programs which the district uses for grade accounting and digital course design, respectively. As the district requires all teachers to use PowerSchool to report their grades and encouraged all teachers to place their course content on Canvas to aid remote instruction during the pandemic, I was not surprised that participants frequently referenced them. Only one teacher out of all the participants was using a completely gamified learning platform, the Classcraft program, during the duration of the study. This teacher used it only with a small class and did so primarily as a classroom management tool but also to reward academic success.

During the interviews, all 14 of the interviewees noted that they used elements of gamification in their teaching to some degree even though they had claimed they did not on their responses to the questionnaire. Likely, this indicates that many, if not all, of the participants who did not take part in the interviews and answered the questionnaire

saying that they did not use gamification or elements of gamification in their teaching might have used gamification. However, this certainly suggests that quite a few teachers in all three high schools use these elements without necessarily having the conscious desire to use gamification in their classes. Table 3 shows the overall teacher responses for each of the six specific gamification elements examined in this study.

Table 3

Overall Extent of Use of Specific Gamification Elements

Element of Gamificaiton	Used Digital Asset	Used	Did Not Use
Achievements	5(7)	9(11)	25(23)
Avatars	3(4)	3(4)	31(30)
Freedom to fail	16(18)	23(27)	11(7)
Leaderboards	6(11)	8(14)	26(20)
Narratives	1	6(17)	28(17)
Points	12(16)	16(21)	18(13)

Note. The numbers on the left of each column are from questionnaire responses. Some participants whom I interviewed provided information that changed the totals from the questionnaires. If there was a change, I provided the new number in parentheses.

Achievements Used

Teachers from all three schools, particularly nearly all those who interviewed, used achievements in some manner. Most of those who used achievements did so in the form of some kind of reward. This could include physical prizes based on small things that students would want or having exemplary work posted on a "billboard" (PB12) in a teacher's room or a "wall of outstanding writing" (GB5). It could also include marbles, tickets, or tokens that the students could then exchange for rewards. Most of these rewards systems were physical, but a few, such as badges earned in programs such as ALEKS, Khan Academy, or the Badgr add-on in Canvas were digital. In their questionnaire responses, teachers from each school mentioned using PowerSchool and

Canvas as their digital tools for providing extra credit awards for special completed tasks or review activities.

Aside from rewards, teachers from all three schools also discussed using digital badges or certifications, such as students "earning a badge per module [to show] competency" (BB1). Teachers who did this were primarily using Khan Academy or Canvas. However, a computer science teacher discussed using the online certification program for that course. Most of the teachers who discussed this expressed their desire to do more in the future as technology starts to make it easier and as the certifications or badges become more meaningful. Table 4 shows the reported extent to which the participants used achievements and a digital asset for achievements.

Table 4

Extent of Use of Achievements

Location	Digital Asset	Used	Did Not Use
Polar Bear High School	2(4)	4(6)	11(9)
Grizzly Bear High School	2	3	10
Black Bear High School	1	2	4
Total participants	5(7)	9(11)	25(23)

Note. The numbers on the left of each column are from questionnaire responses. Some participants whom I interviewed provided information that changed the totals from the questionnaires. If there was a change, I provided the new number in parentheses.

Avatars Used

Although multiple interviewees expressed the desire to learn more about using avatars and perhaps use them in the future, the only teachers who indicated that they used actively used avatars were at Polar Bear High School. They used the Classcraft program and the Boom Learning website where students created avatars that the students could also later change. In both cases, students could earn points that they could use to "change

their costumes," "add pets" (PB2), or "unlock different avatars" (PB4). Another teacher at the same school used avatars to represent students in video games they would play as a reward but did not actively use avatars in any part of the lessons. One participant from Black Bear School District noted that when using "Khan Academy the students choose an avatar … but I do not spend a lot of time with this" (BB6). Other participants mentioned avatars that they found in other digital activities, but the students did not have much, if any, choice in the appearance of those avatars. Table 5 shows the reported extent to which the participants used avatars. All who reported using avatars used a digital asset to do so.

Table 5

Extent of Use of Avatars

Location	Digital Asset	Used	Did Not Use
Polar Bear High School	2(3)	2(3)	13(12)
Grizzly Bear High School	0	0	13
Black Bear High School	1	1	5
Total participants	3(4)	3(4)	31(30)

Note. The numbers on the left of each column are from questionnaire responses. Some participants whom I interviewed provided information that changed the totals from the questionnaires. If there was a change, I provided the new number in parentheses.

Freedom to Fail Used

In all three schools, most of the teachers indicated that they used freedom to fail in some way within their classes. In fact, every participant whom I interviewed but had originally stated that they did not use freedom to fail, changed their answer once they had a better understanding of the concept. Many teachers used freedom to fail by giving students "different ways to complete most assignments" (GB4) or allowing students to "resubmit work or reattempt quizzes" (BB1). The popularity of this gamification element

is understandable as the Bear School District has been encouraging teachers to provide students more opportunities and avenues to succeed.

Many participants noted that they used digital tools to complete this. The most prevalent digital tool was the Canvas learning management system. At least one teacher from each school mentioned using Canvas's ability to allow students multiple attempts on an assignment; however, several teachers at Black Bear and Grizzly Bear High Schools also mentioned using Canvas's Pathways option. Other digital tools that participants used for freedom to fail included resetting tasks on Grad Point and using "digital flashcards for student assignments that monitor progress and allow for reteaching" (PB4). Table 6 shows the reported extent to which the participants used freedom to fail and a digital asset for freedom to fail.

Table 6

Extent of Use of Freedom to Fail

Location	Digital Asset	Used	Did Not Use
Polar Bear High School	9(10)	13(14)	2(1)
Grizzly Bear High School	3(4)	5(8)	8(5)
Black Bear High School	4	5	1
Total participants	16(18)	23(27)	11(7)

Note. The numbers on the left of each column are from questionnaire responses. Some participants whom I interviewed provided information that changed the totals from the questionnaires. If there was a change, I provided the new number in parentheses.

Leaderboards Used

Although they did not use leaderboards as commonly as freedom to fail, participants from all three high schools discussed using leaderboards in their classes. The participants did not use leaderboards for the entire class, but instead for specific events. In some cases, participants did so without digital tools, instead using a whiteboard,

corkboard, cement wall, etc. However, at least one participant at each school mentioned using some kind of digital element. The most common were leaderboards that were automatically maintained by programs such as Kahoot, Quizlet, Vocab.com, or digital Jeopardy reviews. Two participants from Grizzly Bear High School mentioned creating a Google Doc or Google Spreadsheet that they would share with the students either through the Google share feature or up on their Smartboard. Table 7 shows the reported extent to which the participants used leaderboards and a digital asset for leaderboards.

I also included status or progress bars into this category. Participants from all three schools indicated that they used or would like to use some sort of progress system in their classes. In most cases, the digital tools participants used for this were Canvas and PowerSchool where students could see the "assignments posted for the entire semester" (PB12) or could use "the semester percentage as a progress monitor" (BB3). A participant in Black Bear High School noted that assignments from Khan Academy used progress bars while a participant in Polar Bear High School commented on the "pie graph" in ALEKS math (PB3). Again, some teachers used status bars without digital tools, such as "token boards" (PB4), or even one class where the participant "actually had a big thermometer" (GB5).

Table 7

Extent of Use of Leaderboards

Location	Digital Asset	Used	Did Not Use
Polar Bear High School	1(4)	1(4)	14(11)
Grizzly Bear High School	3(4)	4(5)	9(8)
Black Bear High School	2(3)	3(5)	3(1)
Total participants	6(11)	8(14)	26(20)

Note. The numbers on the left of each column are from questionnaire responses. Some participants whom I interviewed provided information that changed the totals from the questionnaires. If there was a change, I provided the new number in parentheses.

Narratives Used

While none of the participants claimed to use a large-scale narrative for their class, participants from all three schools discussed using narratives for smaller projects or assignments within their classes. In Polar Bear High School, a couple of participants "started a classroom economy" (PB4), one of whom made a facsimile bank account spreadsheet where students "get a paycheck for coming to school and then they have to pay rent for the month" (PB4) as well as use their funds for various rewards. A participant in Black Bear High School discussed a lesson where students "had to build their business in Minecraft" (BB4). However, most of the narratives that participants discussed did not use digital elements but were cases where the participant gave the students a role in the lesson, such as putting the students in "a teaching role or a teen leading role" (PB4) or having students "play different roles for a trial" (GB5). Table 8 shows the reported extent to which the participants used narratives and a digital asset for narratives.

Table 8

Extent of Use of Narratives

Location	Digital Asset	Used	Did Not Use
Polar Bear High School	1	2(6)	13(9)
Grizzly Bear High School	1	3(7)	10(6)
Black Bear High School	1	1(4)	5(2)
Total participants	1	6(17)	28(17)

Note. The numbers on the left of each column are from questionnaire responses. Some participants whom I interviewed provided information that changed the totals from the questionnaires. If there was a change, I provided the new number in parentheses.

Points Used

Like with freedom to fail, most of the participants from the three high schools indicated that they used points in some manner for their classes. For almost all of them, this was because they used points within their grading system, whether "everything's graded in points for grades" (PB1) or some assignments are graded using "a four-point grading scale" (GB5). In all these cases, the participants noted using PowerSchool or Canvas as a digital tool to help them with calculating points and reporting them to their students.

Aside from using point systems for grading, some participants used points for other purposes. One participant in Grizzly Bear High School used a Google Sheet to tally points based on how many goals each student reached within a week. Participants in Polar Bear High School used participation points that were "assigned based on student motivation" (PB4) and also used "a classroom economy" (PB4) where students could use tokens in exchange for rewards. Participants noted that online activities, such as Kahoot, Quizlet, or Vocabulary.com use points as a part of their game systems. Table 9 shows the reported extent to which the participants used points and a digital asset for points.

Table 9

Extent of Use of Points

Location	Digital Asset	Used	Did Not Use
Polar Bear High School	4(6)	6(8)	9(7)
Grizzly Bear High School	6(8)	6(8)	7(5)
Black Bear High School	2(2)	4(5)	2(1)
Total participants	12(16)	16(21)	18(13)

Note. The numbers on the left of each column are from questionnaire responses. Some participants whom I interviewed provided information that changed the totals from the questionnaires. If there was a change, I provided the new number in parentheses.

Other Elements Used

At least one participant in each of the three schools mentioned the need for "working with their hands" (PB1), "spontaneous gameplay" (PB3), or an "authentic relational interaction" (BB2) with others. However, none of these include digital elements. One participant from Polar Bear High School mentioned the importance of incorporating the students' "mobile devices" (PB1) to promote student interest, such as in applications like Kahoot. A participant in Grizzly Bear High School discussed putting together boxes of games designed to help students who were struggling with a specific concept. Participants in Black Bear and Polar Bear High Schools mentioned a variety of online applications that contained different gamification elements such as Epic Win, Crazy Uncle, Epic Books, Gravity Lab, PHET, PBS Nova Labs and Training Tree, and Zooniverse which they assigned to students depending on the situation.

Perceptions About the Usefulness of Gamification

Participant opinions from all three schools regarding the usefulness of gamification as a whole to increase student engagement were overwhelmingly positive with some suggesting gamification was "extremely motivating to students" (PB12). Some

participants did list concerns about specific elements of gamification such as how different students might react to them or how the effectiveness of these gamification elements depended on how educators were them. In their interviews, some participants indicated that gamification could be detrimental to some students' engagement. One interviewee was particularly concerned that gamification elements presented "a potential distracter from more authentic learning" (GB3). Table 10 contains the tallies of the 34 participants' responses concerning the perceived usefulness of gamification in increasing student motivation based on the category that best represented their responses in the initial questionnaires and then their interviews. It also includes a column for those participants who indicated that gamification could be potentially detrimental to student engagement.

Table 10

Perceived Usefulness of Gamification in Increasing Student Engagement

Location	Useful	Usefulness Varies	Not Useful or N/A	Potentially Detrimental*
Polar Bear High School	5	10	0	0(2)
Grizzly Bear High School	6(5)	4(6)	3(2)	0(2)
Black Bear High School	3(2)	1(3)	2(1)	0(1)
Total participants	14(12)	15(19)	5(3)	0(5)

Note. The numbers on the left of each column are from questionnaire responses. Some participants whom I interviewed provided information that changed the totals from the questionnaires. If there was a change, I provided the new number in parentheses.
*Participants who indicated that achievements could be detrimental are also included with "usefulness varies" and "not useful" depending on the information they provided.

There were participants from all three schools who believed that gamification was useful in increasing student motivation with comments ranging from statements that gamification is "very important in motivating students" (BB6) to "motivation is high,

surprisingly high" (GB10) with gamification. They provided a variety of answers when I asked why they believed gamification was effective in increasing student motivation. For some, they stated that gamification was "a good way to garner interest in the subject" (GB8) and it "can play a huge role in retaining information" (BB4). Quite a few stated a variety of ideas that I have summarized as "the power of play" (PB13) with ideas ranging from humans are "wired to solve puzzles" (BB4) to when students are "playing a game they forget they're learning" (GB4). Participants from each school even suggested that "the nature of games fits well into learning" (GB9).

Participants gave more specific reasons why they believed gamification was useful in motivating students. One idea that they commonly mentioned across all three schools was that while using gamification, "group interaction and competition has them fully engaged" (BB2). However, the issue of competition was a detractor to some of the participants and would prefer to see gamification "used in a cooperative nature" (GB4). On the topic of group interaction, at least one participant from each school mentioned that gamification contributed to social and emotional learning because gamification can bring a "personal interaction" (BB2) to the class and can be "a way to be together and spend time and build relationships" (GB3). For these reasons, these participants believed that gamification was particularly useful in overcoming student isolation as a means to increase student motivation.

A participant from Polar Bear High School believed that gamification took "the pressure off the kids" (PB3) by making the learning more playful. Participants from both Polar Bear and Black Bear High Schools stated that "it is important that as teachers we

stay current" (PB2) because gamification "it really comes down to catering to 21st Century thinking and the way the kids are being raised right now" (BB4). Participants from Polar Bear and Grizzly Bear High Schools stated that gamification was beneficial because it gives "visual tracking" (PB4) which provides "a quick analysis of where students are at" (GB6). One of them specified that "too often education can be a passive experience" (GB5) and that there was "something active" (GB5) about gamification. Participants from Grizzly Bear and Black Bear High Schools liked gamification because "game elements can be used to foster student choice" (PB4) because "it can be tweaked for the individual learner because there's so many different types and styles and ways to use gamification" (BB4).

However, not all participants felt that gamification was useful in engaging students. Participants from all three schools, including some who also made extremely positive comments about the usefulness of gamification in promoting student engagement, said that gamification "doesn't necessarily appeal to all the kids" (PB1) and that "it can also turn some people off depending on the game" (BB3). A participant from Polar Bear High School noted that for some students, school is "not the biggest problem that they have in life" (PB 12). Participants from Polar Bear and Grizzly Bear High Schools were concerned because, as one said, "I am not a big proponent of extrinsic motivators" (GB5). One further stated that gamification "promotes jumping through the hoops just a little bit more to get the bells and whistles" instead of "true learning" (GB3). Another one of the same participants also raised the concern about students being "on the computer all day" (PB4). Table 11 contains the overall tallies of the 34 participants'

responses concerning the perceived usefulness of each of the six specific gamification elements examined in this study in increasing student motivation based on the category that best represented their responses in the initial questionnaires and then their interviews. It also includes a column for those participants who indicated that these specific elements of gamification could be potentially detrimental to student engagement.

Table 11

Perceived Usefulness of Specific Elements of Gamification in Increasing Student Engagement

Location	Useful	Usefulness Varies	Not Useful	No Answer	Potentially Detrimental*
Achievements	6(8)	2(4)	1	25(21)	1
Avatars	1(3)	2(3)	0(2)	31(26)	0(1)
Freedom to fail	15(18)	3(5)	3	13(8)	2
Leaderboards	4(8)	4(6)	0(1)	26(19)	3(4)
Narratives	6(14)	0(2)	0	28(18)	0(1)
Points	8(10)	8(10)	1	17(13)	0(1)

Note. The numbers on the left of each column are from questionnaire responses. Some participants whom I interviewed provided information that changed the totals from the questionnaires. If there was a change, I provided the new number in parentheses. *Participants who indicated that achievements could be detrimental are also included with "usefulness varies" and "not useful" depending on the information they provided.

Achievements' Usefulness

Multiple participants from all three schools found that achievements were motivating for both students and themselves, while at least one participant from all three schools stated that achievements were "not that motivating" (PB3) or even "de-motivating for some" students (BB3). The degree of usefulness for achievements in promoting motivation differed between those who believed achievements were motivating, from "achievements are invaluable" (PB4) to using achievements "was motivating … for 80% of the kids" (GB4). Table 12 contains the tallies of the 34

participants' responses concerning the perceived usefulness of achievements in increasing student motivation based on the category that best represented their responses in the initial questionnaires and then their interviews. It also includes a column for the participants who indicated that achievements could be potentially detrimental to student engagement.

Table 12

Perceived Usefulness of Achievements in Increasing Student Engagement

Location	Useful	Usefulness Varies	Not Useful	No Answer	Potentially Detrimental*
Polar Bear High School	3(4)	0(1)	1	11(9)	1
Grizzly Bear High School	2(3)	1	0	10(9)	0
Black Bear High School	1	1(2)	0	4(3)	0
Total participants	6(8)	2(4)	1	25(21)	1

Note. The numbers on the left of each column are from questionnaire responses. Some participants whom I interviewed provided information that changed the totals from the questionnaires. If there was a change, I provided the new number in parentheses.
*Participants who indicated that achievements could be detrimental are also included with "usefulness varies" and "not useful" depending on the information they provided.

For those who found achievements to be successful, at least one participant from each high school noted that achievements recognized outside of just the classroom were important. One participant summed this up by saying, "certificates of achievement are huge" (PB12). Other participants focused more on the rewards aspect of achievements with comments such as students "are wanting to earn snacks" (PB2) or that what is "motivating for them is the tickets that they can buy with their [in class] money" (PB4). Participant 4 from Polar Bear High School also emphasized that "small rewards given frequently work best." In terms of digital badges, a participant from Polar Bear High

School commented that it "is really important if we can put it into where the reporting is" (PB1).

Participants who felt that achievements were not motivating did not provide as many explanations for why they believed that. One participant from Polar Bear High School referenced rewards when saying "there is there is nothing that I can offer [students] that's a big enough ticket item" (PB3) and later mentioned digital badges by saying that a progress indicator "is more motivating than the badges" (PB3). A participant from Grizzly Bear High School was particularly concerned that rewards could be "a potential distracter from more authentic learning" (GB3).

Avatars' Usefulness

There was not enough experience with avatars for most of the participants to fully judge their usefulness in increasing student motivation, but the few who used them provided encouraging experiences. Both participants from Polar Bear High School who reported using avatars in their classes expressed surprise that avatars were useful in motivating their students. One particularly did not expect high school boys to be interested in avatars but noted that "they seem to like that avatar" (PB2) and that their "students are trying to outdo each other with their avatars" (PB2). The other participant noticed that students' avatars "changed quite often" (PB4) suggesting that students were frequently using them. In addition, the questionnaire respondent from Black Bear School who only used avatars tangentially by assigning tasks in Khan Academy stated, "I think [students] like them" (BB6).

Table 13 contains the tallies of the 34 participants' responses concerning the perceived usefulness of avatars in increasing student motivation based on the category that best represented their responses in the initial questionnaires and then their interviews. It also includes a column for the participant who indicated that avatars could be potentially detrimental to student engagement. The participant who believed that avatars might be detrimental had not used them but felt that some students would be excited by them, while others might feel "this is that class where we have that stupid thing with the avatar" (BB1).

Table 13

Perceived Usefulness of Avatars in Increasing Student Engagement

Location	Useful	Usefulness Varies	Not Useful	No Answer	Potentially Detrimental*
Polar Bear High School	1	1(2)	0(1)	13(11)	0(1)
Grizzly Bear High School	0(1)	0	0	13(12)	0
Black Bear High School	0(1)	1	0(1)	5(3)	0
Total participants	1(3)	2(3)	0(2)	31(26)	0(1)

Note. The numbers on the left of each column are from questionnaire responses. Some participants whom I interviewed provided information that changed the totals from the questionnaires. If there was a change, I provided the new number in parentheses.
*Participants who indicated that achievements could be detrimental are also included with "usefulness varies" and "not useful" depending on the information they provided.

Freedom to Fail's Usefulness

Freedom to Fail prompted a wide range of responses about its usefulness. Nearly every participant from all three schools commented on it in one way or another. At least one participant from each school believed that freedom to fail was extremely useful in increasing student engagement with responses such as "great learning happens with failure" (BB2) and "I embrace the freedom to fail because I embrace the growth mindset"

(PB12). Similarly, at least one participant from each school believed that the usefulness of freedom to fail varied between students with comments such as “some kids are motivated, some aren’t” (PB1), “freedom to fail seems to work for 75% of kiddos” (BB1), and “I think it has everything to do with personality types” (BB4). Meanwhile, at least one participant from each school did not find freedom to fail useful, providing comments such as “I don't know that it motivates them much” (PB4) and “I hate freedom to fail” (GB12). Table 14 contains the tallies of the 34 participants’ responses concerning the perceived usefulness of freedom to fail in increasing student motivation based on the category that best represented their responses in the initial questionnaires and then their interviews. It also includes a column for the participants who indicated that freedom to fail could be potentially detrimental to student engagement.

Table 14

Perceived Usefulness of Freedom to Fail in Increasing Student Engagement

Location	Useful	Usefulness Varies	Not Useful	No Answer	Potentially Detrimental*
Polar Bear High School	10	1(2)	1	3(2)	0
Grizzly Bear High School	3(5)	1(2)	1	8(5)	1
Black Bear High School	2(3)	1	1	2(1)	1
Total participants	15(18)	3(5)	3	13(8)	2

Note. The numbers on the left of each column are from questionnaire responses. Some participants whom I interviewed provided information that changed the totals from the questionnaires. If there was a change, I provided the new number in parentheses.
*Participants who indicated that achievements could be detrimental are also included with “usefulness varies” and “not useful” depending on the information they provided.

Participants provided various reasons for why they believed freedom to fail increased student engagement. Two respondents from Polar Bear high school indicated that freedom to fail “gives [students] a bit of ownership over their work” (PB11). Another

stated that “knowing they have another chance takes some pressure off” (PB6). A participant from Grizzly Bear High School stated that, particularly while learning remotely due to COVID-19, freedom to fail motivated students because “then they're not being punished for struggling to be independent at home” (GB1). A participant from Black Bear High School responded to freedom to fail’s ability to overcome student isolation by saying that they were “not sure about motivation, but it certainly helps with [students’] SEL [social and emotional learning]” (BB1).

Other participants provided reasons why freedom to fail was not as motivating. One participant from Black Bear High School stated that “freedom to fail allows the student the opportunity to procrastinate” (PB2) and that “it puts that that onus on the teacher” (PB2). The participant further expressed that “I don’t think the system is set up for much failure” (PB2). Participants from Grizzly Bear High School noted that freedom to fail can become a problem “when a student is way behind” (GB8).

Leaderboards’ Usefulness

I regret that I did not make a separate category for status or progress bars because opinions on leaderboards, in which I included status or progress bars, varied greatly depending on their use as leaderboards or progress bars. In general, responses regarding leaderboards that placed students in competition with one another were more divided than progress bars or status bars where students individually saw their progress in comparison to some sort of set goal. Even within leaderboards that involved competition, participants views varied depending on what the leaderboards displayed and whether educators used them for comparison between individual students or between groups of students. Table

15 contains the tallies of the 34 participants' responses concerning the perceived usefulness of avatars in increasing student motivation based on the category that best represented their responses in the initial questionnaires and then their interviews. It also includes a column for the participants who indicated that leaderboards could be potentially detrimental to student engagement.

Table 15

Perceived Usefulness of Leaderboards in Increasing Student Engagement

Location	Useful	Usefulness Varies	Not Useful	No Answer	Potentially Detrimental*
Polar Bear High School	1(3)	0(2)	0	14(10)	0(1)
Grizzly Bear High School	1(2)	3	0	9(8)	2
Black Bear High School	2(3)	1	0(1)	3(1)	1
Total participants	4(8)	4(6)	0(1)	26(19)	3(4)

Note. The numbers on the left of each column are from questionnaire responses. Some participants whom I interviewed provided information that changed the totals from the questionnaires. If there was a change, I provided the new number in parentheses. *Participants who indicated that achievements could be detrimental are also included with "usefulness varies" and "not useful" depending on the information they provided.

Regarding leaderboards used in a competitive manner, at least one participant from each school indicated that leaderboards had a positive role in student engagement. Reasons given for this included statements such as "competition is a powerful motivator" (GB10), students "like to see their standing" (BB2), and that "they want to see themselves on the leaderboard" (BB3). Similarly, at least one participant from each high school agreed that "every kid is different, and everybody is going to respond differently" (PB4). They provided statements such as "some [students] are a lot more competitive than others" (PB2) and that the leaderboard "was a huge motivator for about half" of a participant's students (GB9). However, at least one participant from each school was also

fervently against competitive leaderboards, providing reasons such as “it just it brought out who was already on top and who was already on the bottom, and the kids already know that” (GB4), that the participant would “never want a kid to compare themselves to another and feel bad about progress” (BB1), and “even without putting anybody's name on it, just the scores, it would crush some of those kids” (BB2). One respondent even stated, “professionally, that's wrong” (PB12), and another noted that these sorts of “leaderboards can also cause problems” (GB9) including upset students “deliberately sabotaging” a program (GB9).

Responses to the usefulness of status or progress bars in increasing student engagement were more often positive. At least one participant from each of the three high schools stated a sentiment such as “the progress bar was a great motivation” (GB4). Some of the reasons given for this included that status bars “encourage students to be on pace” (PB12), provided “a concrete list of things that [students] have to accomplish” (PB12) and that they “provide instant gratification” (GB1) by letting students “see where they are towards their goal” (PB4). Not all responses were as positive. One participant from Grizzly Bear High School noted that progress bars “can lead to an unwanted, unintentional sense of defeat” in some students (GB10). Similarly, a participant from Polar Bear High School noted that “for some kids, it puts so much pressure on them … that constant visual reminder just builds the anxiety up so high” (PB3).

Narratives’ Usefulness

Although none of the participants used narratives on a large scale in their classes, participants from all three high schools found narratives to be useful in increasing student

engagement. Participants who found narratives useful in increasing student motivation provided comments such as “I wish I did more of it” (GB5), it “has a lot of value because, again, you're just making it fun” (BB3), and that students “love those kinds of assignments” (BB2). Only two participants specifically noted that narrative did not seem to motivate their students. Both participants mentioned this regarding students in their classes who might have special needs with comments such as “some of my kids aren't capable of that kind of following the storyline” (PB4) and “it could even be a little bit of a detractor” (PB2). However, one later responded in a journal that the participant was able to use a narrative “to motivate a student who had an unusual tech issue to redirect his frustration” (PB4). Table 16 contains the tallies of the 34 participants’ responses concerning the perceived usefulness of narratives in increasing student motivation based on the category that best represented their responses in the initial questionnaires and then their interviews. It also includes a column for the participant who indicated that narratives could be potentially detrimental to student engagement.

Table 16

Perceived Usefulness of Narratives in Increasing Student Engagement

Location	Useful	Usefulness Varies	Not Useful	No Answer	Potentially Detrimental*
Polar Bear High School	3(4)	0(2)	0	12(9)	0(1)
Grizzly Bear High School	2(6)	0	0	11(7)	0
Black Bear High School	1(4)	0	0	5(2)	0
Total participants	6(14)	0(2)	0	28(18)	0(1)

Note. The numbers on the left of each column are from questionnaire responses. Some participants whom I interviewed provided information that changed the totals from the questionnaires. If there was a change, I provided the new number in parentheses.
*Participants who indicated that achievements could be detrimental are also included with “usefulness varies” and “not useful” depending on the information they provided.

Points' Usefulness

Most of the participants from all three high schools indicated that they used points in their teaching, and nearly all of them said that it had a positive effect on student engagement. Responses included statements such as students "want their points" (BB2), that a point system "applies to grades, so [it is] pretty motivating" (GB11), and that "points motivate [students] to do their best" (PB5). None of the participants indicated that points were a discouragement to students; however, at least one participant from each school noted that the effectiveness of points on engagement varied, stating that points could be motivating "depending on the student" (PB2), that "some kids care; a lot do not" (GB12), or that points are "very motivating for the ones who want to get their work done" (PB12). Participants from Black Bear School District were concerned that "the grade [students] would earn based on the points doesn't match up" to the student's skills (BB1) or that students are "not learning, but they're getting points" (BB3). Table 17 contains the tallies of the 34 participants' responses concerning the perceived usefulness of points in increasing student motivation based on the category that best represented their responses in the initial questionnaires and then their interviews. It also includes a column for the participant who indicated that points could be potentially detrimental to student engagement.

Table 17

Perceived Usefulness of Points in Increasing Student Engagement

Location	Useful	Usefulness Varies	Not Useful	No Answer	Potentially Detrimental*
Polar Bear High School	2(3)	3(4)	1	9(7)	0
Grizzly Bear High School	3	4(5)	0	6(5)	0
Black Bear High School	3(4)	1	0	2(1)	0(1)
Total participants	8(10)	8(10)	1	17(13)	0(1)

Note. The numbers on the left of each column are from questionnaire responses. Some participants whom I interviewed provided information that changed the totals from the questionnaires. If there was a change, I provided the new number in parentheses. *Participants who indicated that achievements could be detrimental are also included with "usefulness varies" and "not useful" depending on the information they provided.

Perceptions About the Ease of Use of Gamification

Although participants from all three high schools had comments regarding the ease of use of individual elements of gamification, participants directed most of their comments about ease of use to gamification as a single entity. As most of the participants recognized that gamification was useful to many, if not all, students in overcoming isolation and increasing engagement, the TAM suggests that difficulties arising in the ease of use of gamification might prevent educators from adopting it (see Scherer et al., 2019). Thus, I also included participant responses to questions about what they felt that they needed to better implement gamification in their classes. This provided with multiple suggestions that indicate areas where gamification's ease of use is currently lacking.

Table 18 contains the tallies of the 34 participants' responses concerning the perceived ease of use of gamification in increasing student motivation based on the category that best represented their responses in the initial questionnaires and then their

interviews. I placed participants who did not mention using gamification in the Difficult to Use / Not Used column. The table also includes columns for the participants who indicated that time is a factor, or training or resources are factors, in their perceived ease of use of gamification whether they indicated that it was easy or difficult to use.

Table 18

Perceived Ease of Use of Gamification in Increasing Student Engagement

Location	Easy to Use	Difficult to Use / Not Used	Time Is a Factor	Training or Resources Are Factors
Polar Bear High School	4	11	12	3
Grizzly Bear High School	4	9	6	2
Black Bear High School	4	2	1	2
Total participants	12	22	19	7

The biggest concern with using gamification was the time that it involved. Even when the participants stated that they believed using gamification was worth investing their time, the concern listed by most of the participants from all three schools were variations of "I don't have enough time" (BB4). At least one participant from each of the three schools specifically identified their course load as part of their time issue, making statements such as "teaching multiple subjects to multiple grades makes creating games difficult" (PB3).

Generally, participants found it relatively easy to use gamification elements with which they were already familiar. However, many participants in all three schools noted that they did not use gamification as much because they did not know what was available or how to use it. Multiple teachers from each of the three schools had suggestions regarding "professional development" (PB12), "needing more tutorials" (PB2), or getting

the chance "to watch a teacher do this" (GB5). At least one teacher in each of the three schools recommended something like "having a professional or a group of colleagues … to dedicate time and try [gamification]" (BB3). In fact, at least one interviewee from each school specifically asked me to personally organize future professional development events for the district, or to at least send them more information on gamification.

A third area that made gamification more difficult to use for participants at all three high schools was the lack of "a school framework" (PB4) that was "financially backed by the district" (PB12). Participants in all three schools specifically noted issues with having "Canvas sync with PowerSchool" (BB1) which frequently required them "to do it more manually … [because] you have to go in and do each kid individually" (PB2). A teacher from Black Bear High School noted that this "ends up being a deal breaker as far as teacher time goes" (BB1). Teachers from all three schools noted their desire that the current system "was just a bit more user friendly" (PB2) because if people "get two or three clicks in and they're not successful, they quit" (PB1).

Another issue that at least one participant from each of the three high schools discussed was the need to "see what types of technology or activities that students value" (PB2). Responses similar to this sentiment included statements such as educators have "got to work with [student] motivations" (PB4) and that they "have to think and consider that these [students] are all different learners" (BB4). Additionally, teachers at Polar Bear and Grizzly Bear High Schools noted that not all students have access to the technology needed for work district programs that use gamification elements.

Table 19 contains the overall tallies of the 34 participants' responses concerning the PEU of each of the six specific gamification elements examined in this study in increasing student motivation based on the category that best represented their responses in the initial questionnaires and then their interviews. I placed participants who did not mention using achievements in the Difficult to Use / Not Used column. The table also includes columns for the participants who indicated that time is a factor, or training or resources are factors, in their PEU of achievements whether they indicated that it was easy or difficult to use.

Table 19

Perceived Ease of Use of Specific Elements of Gamification in Increasing Student Engagement

Location	Easy to Use	Difficult to Use / Not Used	Time Is a Factor	Training or Resources Are Factors
Achievements	9	25	2	5
Avatars	3	31	2	5
Freedom to fail	24	10	8	0
Leaderboards	11	23	3	8
Narratives	9	25	7	1
Points	19	15	3	2

Achievements' Ease of Use

Participants from all three high schools noted that online programs, such as Khan Academy, Classcraft, or ALEKS math, that automatically incorporated digital achievements were easy to use. However, participants from Polar Bear and Black Bear High Schools who discussed creating their own digital badges through the Badgr application in Canvas found that "Badgr isn't that user friendly" (BB1). One participant

from Polar Bear High School said that it would be easier "if we could incorporate some of that into [the students'] PowerSchool" (PB1).

Table 20 contains the tallies of the 34 participants' responses concerning the PEU of achievements in increasing student motivation based on the category that best represented their responses in the initial questionnaires and then their interviews. I placed participants who did not mention using achievements in the Difficult to Use / Not Used column. The table also includes columns for the participants who indicated that time is a factor, or training or resources are factors, in their PEU of achievements whether they indicated that it was easy or difficult to use.

Table 20

Perceived Ease of Use of Achievements in Increasing Student Engagement

Location	Easy to Use	Difficult to Use / Not Used	Time Is a Factor	Training or Resources Are Factors
Polar Bear High School	6	9	0	2
Grizzly Bear High School	2	11	1	1
Black Bear High School	1	5	1	2
Total participants	9	25	2	5

Avatars' Ease of Use

The three participants who discussed using avatars in their classes all stated that it was "very easy" (PB2) if the programs they used already incorporated avatars into their design. However, one participant from Grizzly Bear High School who was "super excited to use avatars" in Classcraft "just really felt overwhelmed with how to use Classcraft" and "really researched it and there was nothing" (GB4). This led the participant to abandoning Classcraft entirely.

Table 21 contains the tallies of the 34 participants' responses concerning the PEU of avatars in increasing student motivation based on the category that best represented their responses in the initial questionnaires and then their interviews. I placed participants who did not mention using avatars in the Difficult to Use / Not Used column. The table also includes columns for the participants who indicated that time is a factor, or training or resources are factors, in their PEU of avatars whether they indicated that it was easy or difficult to use.

Table 21

Perceived Ease of Use of Avatars in Increasing Student Engagement

Location	Easy to Use	Difficult to Use / Not Used	Time Is a Factor	Training or Resources Are Factors
Polar Bear High School	2	13	1	3
Grizzly Bear High School	0	13	1	1
Black Bear High School	1	5	0	1
Total participants	3	31	2	5

Freedom to Fail's Ease of Use

At least one participant from each of the three high schools discussed how creating the multiple avenues to success form of freedom to fail "takes time and effort and planning" (BB3), but that "other than the time element, it is pretty easy" (PB7). One participant from Black Bear High School noted that "it does take some planning and experimentation, but once you find that something works it will work for the rest of your career" (BB4). On the aspects of freedom to fail that allow students multiple chances at assignments, some participants at Polar Bear and Grizzly Bear High Schools noted that Canvas and other programs can automatically score many assignments, so teachers are

"not hand grading a lot of information" (PB12). However, participants at all three high schools noted that, without an automated system, regrading assignments can be "slightly time consuming" (BB3).

Table 22 contains the tallies of the 34 participants' responses concerning the PEU of freedom to fail in increasing student motivation based on the category that best represented their responses in the initial questionnaires and then their interviews. I placed participants who did not mention using freedom to fail in the Difficult to Use / Not Used column. The table also includes columns for the participants who indicated that time is a factor, or training or resources are factors, in their PEU of freedom to fail whether they indicated that it was easy or difficult to use.

Table 22

Perceived Ease of Use of Freedom to Fail in Increasing Student Engagement

Location	Easy to Use	Difficult to Use / Not Used	Time Is a Factor	Training or Resources Are Factors
Polar Bear High School	14	1	5	0
Grizzly Bear High School	6	7	3	0
Black Bear High School	4	2	0	0
Total participants	24	10	8	0

Leaderboards' Ease of Use

Participants from each of the three high schools who mentioned using competitive leaderboards in programs such as Kahoot, Quizlet, or Vocabulary.com found them to be "somewhat easy" (GB1) or "not difficult at all" (BB2) because the leaderboards were "an auto-generated thing" (PB12). For the two Grizzly Bear High School participants who mentioned using a Google Doc or Google Sheets for their personally created

leaderboards, the process was "pretty simple" (GB5), but they need to remember to update them.

At least one participant from all three high schools mentioned placing all their course assignments on Canvas as "a progress monitor" (BB3). They said that they could "fill in zeroes for the entire semester so [students] can play the course like a game" (BB1) or use the "What If? Calculator" function in Canvas (PB12). Each of these participants said that this required work at the beginning of the school year but made their lives easier as the semester went on.

Table 23 contains the tallies of the 34 participants' responses concerning the PEU of leaderboards in increasing student motivation based on the category that best represented their responses in the initial questionnaires and then their interviews. I placed participants who did not mention using leaderboards in the Difficult to Use / Not Used column. The table also includes columns for the participants who indicated that time is a factor, or training or resources are factors, in their PEU of leaderboards whether they indicated that it was easy or difficult to use.

Table 23

Perceived Ease of Use of Leaderboards in Increasing Student Engagement

Location	Easy to Use	Difficult to Use / Not Used	Time Is a Factor	Training or Resources Are Factors
Polar Bear High School	3	12	1	4
Grizzly Bear High School	5	8	0	2
Black Bear High School	3	3	2	2
Total participants	11	23	3	8

Narratives' Ease of Use

In only a couple of cases did participants mention using digital forms of narratives. The participant from Polar Bear High School who used Classcraft found the narrative option "not very easy" to use and that it "wasn't much of a motivator" for the students, and so "did not really use it" (PB2). The participant from Black Bear High School who created a business scenario for students in Minecraft did so with almost a year of preparation for the unit. Even those who did not use digital elements noted that narratives could take time to set up. However, some stated that creating a narrative "can be as simple as a prompt" (BB3) and that "there are certain elements of narrative that are just kind of a natural part of teaching" (PB4).

Table 24 contains the tallies of the 34 participants' responses concerning the PEU of narratives in increasing student motivation based on the category that best represented their responses in the initial questionnaires and then their interviews. I placed participants who did not mention using narratives in the Difficult to Use / Not Used column. The table also includes columns for the participants who indicated that time is a factor, or training or resources are factors, in their PEU of narratives whether they indicated that it was easy or difficult to use.

Table 24

Perceived Ease of Use of Narratives in Increasing Student Engagement

Location	Easy to Use	Difficult to Use / Not Used	Time Is a Factor	Training or Resources Are Factors
Polar Bear High School	4	11	2	1
Grizzly Bear High School	3	10	3	0
Black Bear High School	2	4	2	0
Total participants	9	25	7	1

Points' Ease of Use

As all the respondents used points in some manner for the purpose of grading, nearly all of them reported that doing so was "not difficult at all" (BB4) as "it is part of how they receive a grade" (GB12). For the respondents who used classroom economies in Polar Bear High School, they mentioned that it was "difficult to set up the point systems, trying to think of all the possibilities" but that "once the program is set up it was easy to use" (PB4). However, one participant from Grizzly Bear High School stated the participant avoided point systems other than for grades because they required "too much managing for me" (GB2).

Table 25 contains the tallies of the 34 participants' responses concerning the PEU of points in increasing student motivation based on the category that best represented their responses in the initial questionnaires and then their interviews. I placed participants who did not mention using points in the Difficult to Use / Not Used column. The table also includes columns for the participants who indicated that time is a factor, or training or resources are factors, in their PEU of points whether they indicated that it was easy or difficult to use.

Table 25

Perceived Ease of Use of Points in Increasing Student Engagement

Location	Easy to Use	Difficult to Use / Not Used	Time Is a Factor	Training or Resources Are Factors
Polar Bear High School	7	8	2	1
Grizzly Bear High School	7	6	1	1
Black Bear High School	5	1	0	0
Total participants	19	15	3	2

Evidence of Trustworthiness

As mentioned in the section on Data Collection, I did not begin my study until I received approval from the school district, each of the three schools, and Walden University's IRB. With the exception of my anticipated timeline for collecting data, I followed the guidelines and strictures to which we had agreed. I continued to keep the school administrators informed of my progress throughout the process.

I used three instruments for data collection in this study: a questionnaire found in Appendix A, an interview guide found in Appendix B, and a 10-Day Journal template found in Appendix C. To test the validity of these instruments, I shared these instruments with my committee and created a separate expert panel to review and make suggestions about the instruments. Only two of the three experts in my panel returned their validation forms, which are in Appendices D and E. I did not incorporate all their suggestions, as some of them required a redesign of my study, but I did make numerous changes and additions based on their advice. I then field tested the instruments by asking colleagues at the high school where I work, which was not part of the study, to complete the questionnaire and take part in the interview. I made further changes based on their suggestions and my own experience in using the instruments. None of my colleagues were interested in testing my journal template.

I originally intended to use a purposive sampling strategy for selecting my interviewees by using the information they provided on the questionnaire as a guide. However, due to the slow and low participation of participants in my study, I relied on the convenience sampling that the questionnaire responses provided. I attempted to use a

"snowballing" technique of asking interviewees and administrators for suggested participants, but only brought in a couple of participants in that manner.

Although I used three instruments to create triangulation with my instruments, very few participants took part in the 10-Day Journal. I still used the information provided by the three participants who completed the journals and the two participants who partially completed them, but I do believe such a small sampling can be a reliable means of triangulation. However, Yin (2012) noted that triangulation in case studies can come from just two sources of data. I also used triangulation by approaching this as a multicase study and examining three separate high schools within the Bear School District.

To help ensure that I was not allowing personal biases to color my analysis of the data, I provided each interviewee to their edited transcripts and a summary of my initial findings which I created based on my early analysis of the transcript and the notes which I took during the interview. I requested that they make corrections, clarifications, and additions as needed (see Ravitch & Mittenfelner Carl, 2016). Aside from some comments about grammar and mechanics, none of the participants who responded had any suggestions for changes or additions. I also completed my coding and many of my categories using in vivo coding to describe my multicase study using my participants' words rather than my own (see Saldaña, 2016).

Summary

This multicase study showed that educators from three high schools in the Bear School District of Alaska used at least one digital gamification element in their teaching

even if they were not consciously attempting to use gamification, or even recognize that their practice was a type of gamification. PowerSchool and Canvas were the two digital assets that the participants most frequently used. Although only a couple of participants used digital platforms specifically designed for gamification, many participants used online applications that included elements of gamification. Freedom to fail and points systems were the digital techniques that teachers most used. The participants of this study had varied use and beliefs about the use of leaderboards and achievements. Almost no teachers used digital aspects of avatars or narratives in their teaching.

All the participants noted that gamification was useful in overcoming student isolation and increasing student engagement to some degree; although one participant only admitted to it being slightly useful and expressed concerns about the long-term effects of gamification's use. Participants differed in how useful various elements of gamification were in increasing student engagement, with most participants agreeing that it depended on the student. Generally, although each school had at least one person who disagreed, most participants found each of the elements to be beneficial in increasing student engagement except for competitive leaderboards, which were more controversial.

The participants' perceptions about the ease of use of digital assets and techniques of gamification largely depended upon each participant's experience with them. However, almost all participants indicated that they needed more time, resources, and training to effectively use gamification in the future. They also suggested the need for more user-friendly and widely adopted systems that consider student interests and needs.

In this chapter I provided the settings for this multicase study before explaining the methods I used for my data collection and my description of the long process that occurred. Once I explained the collection process, I detailed my data analysis, explaining the in vivo coding process I used, the method I used to create categories and then organize codes within those categories, my use of my notes and questionnaire responses, and the means which I analyzed the three separate cases. From there, I listed my results, using the participants' own words and phrases to support my findings for my three research questions. I then presented my evidence of trustworthiness and finally completed this summary. In Chapter 5, I will describe my interpretations of this study's findings, the limitations of the study, my recommendations, and the implications of this research before presenting my conclusion.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this multicase study was to understand the extent to which digital gamification assets and techniques are being used by high school teachers from three high schools in the Bear School District in Alaska to increase engagement in students. I chose a multicase study desing because I wanted to see the status of gamification use of the district where I work (see Yin, 2012), and I did not want to use the largest high school in the district because of the ethical concern that my working there would compromise the data (see Ravitch & Mittenfelner Carl, 2016). I conducted this study because, according to the director of educator and school excellence in Alaska and Pektaş & Kepceoğlu (2019), there was little known about what elements of gamification high school teachers are using, how they are using them, how useful those elements are for increasing high school student engagement, and how easy they are for high school teachers to use, particularly in Alaska.

Despite using a multicase study design, I noted few differences between the responses from the participants from three different high schools related to the extent to which they used, the PU of, and the PEU of digital assets and techniques of gamification. While I described the minor differences in use and understanding of different elements of gamification by participants at the three high schools in the Results section of Chapter 4, most of the information provided suggested that there was little difference between the schools because they were a part of the same school district and had access to similar levels of technology and training. In fact, one constant between the three schools was that

participants who had experience in distance education or special education were both the first ones to respond to my inquiries and the ones to provide the most detailed answers.

Through this study, I discovered that most of the participants used some element or elements of gamification in their teaching to increase student motivation. They most commonly used digital assets and techniques for the elements of freedom to fail and points. They were more varied in their use and attitudes towards achievements and leaderboards, while only a few used digital assets or techniques for avatars or narratives despite positive opinions about their usefulness. Participants from all three schools showed a varied, if generally positive, response to the usefulness of gamification as a whole and the six focal gamification elements of the study: achievements, avatars, freedom to fail, leaderboards, narratives, and points. Generally, participants found elements with which they had more familiarity, such as freedom to fail and points, to be the easiest to use.

Interpretation of the Findings

This study helps fill the gap in literature concerning teachers' perceptions about effectiveness of gamification and its various elements (see Bai et al., 2020). Similarly, it helps fill the gap in practice concerning the lack of understanding about how high school teachers in Alaska are using gamification to increase student engagement, as expressed by the drector of educator and school excellence in Alaska. The results of this study indicate that many high school teachers find gamification, particularly its elements of freedom to fail and points, to be effective at increasing the engagement of most students. They also support the idea that not all high school students respond in the same way to

the various elements of gamification. The findings demonstrate the importance of following Landers's (2014) theory of gamified learning due to the differing responses of the participants to the elements of gamification that I presented. Furthermore, the study indicates the effectiveness of using the TAM developed by Davis (1989) as a means of studying the usefulness of gamification in education and its adoption by teachers.

Gamification and Student Engagement

Multiple researchers discovered that educational systems that incorporated gamification increased student engagement more than traditional methods. Lin and Shih (2015) found that to be true with college-age students in Taiwan. Tan and Hew (2016) saw similar results in their experiment with college-aged students in Hong Kong, while Bovermann and Bastiaens (2019), Tsay et al. (2018), and Chen et al. (2015) noticed increased engagement in college-aged German, British, and U.S. students, respectively. Sixth-grade students in Turkey also showed increased engagement (Şahin & Namli, 2016). The current study findings support the above studies in that teachers in this study also believed gamification increased student engagement. The findings of the current study also expanded the above findings from colleges and primary schools because most of the participants in this study commented that gamification was useful in increasing student engagement at the high school level.

Different Effects of Different Elements of Gamification on Different Students

Lopez and Tucker (2019) and Kocadere and Çağlar (2018) found evidence that different types of college students reacted differently to different elements of gamification. I noticed this same idea in the descriptions the participants gave about how

their high school students reacted to different elements of gamification. The current study did not address specific learner types like the abovementioned studies did, but the differences were still present. This was particularly true in the section on Leaderboards' Usefulness in Chapter 4. Even though most participants stated that progress indicators were useful in promoting student engagement, a couple of participants from Polar Bear High School mentioned that those types of progress monitors could be a detriment to some of their students' motivation while a benefit to others. Meanwhile, those participants noted that avatars had completely opposite effects on those groups of students in terms of usefulness at increasing or decreasing their engagement.

Usefulness of the Theory of Gamified Learning

In this study, the results I collected indicated that Landers's (2014) theory of gamified learning is an essential component when researching gamification in education. I was able to better construct the extent to which my participants used elements of gamification when I had them examine the six gamification elements provided: achievements, avatars, freedom to fail, leaderboards, narratives, and points. This helped me determine the degree to which my participants used gamification, with only one of them from Polar Bear High School using entirely gamified learning systems on a regular basis. Focusing on particular elements of gamification also helped me better explain how participants might use gamification in their classes.

The theory of gamified learning allows researchers to examine the ways that teachers are using gamification. This was particularly helpful in discussing the specific uses of different gamification elements in the current study. For example, most of the

participants used points as an overall system for grading purposes; however, some participants used a more targeted approach for their points, using different types of points for different purposes. Teachers in Polar Bear and Grizzly Bear High Schools used points for grades but separate sets of points to track behavior, goals, or their classroom economy.

Usefulness of TAM in Researching Gamification in Education

Scherer et al. (2019) effectively used the TAM to describe how teachers accept and adopt technology involved in gamification. Developed by Davis (1989), TAM helps researchers understand why some technological developments are adopted while others are not. The model particularly focuses on the mechanics of PU and PEU, generally suggesting that PU is the primary motivator when it comes to technology adoption. TAM was beneficial in examining the extent to which gamification was used in the Bear School District, particularly in focusing my attention on the participants' perceptions regarding its usefulness and ease of use.

PU played a significant role in the participants' adoption of the digital assets and techniques of gamification. This finding was particularly suggested by the participant from Grizzly Bear High School who, even after further explanation in the interview, only acknowledged using one digital element of gamification, points, in a limited manner. During the interview, this participant stated, "I'm not a digital native, and I'm not a gamer." A little later the participant further added, "I had a strong bias against gaming … because of the road that I've seen many of my students and my own children and some of

my peers go down." Clearly, the participant did not see gamification as useful and, thus, did not want to adopt it as an educational practice.

As indicated in the Results section of Chapter 4, participants' perceptions concerning the ease of use of gamification varied from participant to participant and from one gamification element to another. Many participants saw gamification and these specific elements of gamification useful for increasing student engagement and providing other benefits, which suggests that they avoided implementing some of them due to the difficulty in using them. The results showed this most clearly in the gamification element of achievements. Participants from all three schools mentioned the benefits of using achievements, perhaps even as a replacement for the tradition grade system, but few of them used digital achievements, let alone as a major component of their classes. A couple of participants remarked about having made the attempt but found that the process was too difficult for them to either create or maintain. For these participants, PEU was a determining factor in their lack of adoption of that gamification element; however, they likely would not have progressed that far if they did not think that it was useful.

Limitations of the Study

Without having every educator in each school participating, it is not possible to know the complete extent to which teachers are using gamification elements to engage their high school students. For that matter, my decision to focus on teachers in only three high schools rather than all high school teachers in the district limits the conclusions that I can draw about the district as a unit. Similarly, educators and researchers should not use

this study to make assumptions about the use and usefulness of gamification in high schools outside of the Bear School District.

I had originally planned to collect my questionnaire and conduct my interviews in a few weeks with the journals only taking a couple of weeks more. However, I instead collected data for 4 months, almost an entire semester in the district. Although it was necessary to extend this data collection period so that enough educators could participate and I could get a clear picture of these three schools, it is possible that this extended data collection process could have changed participants' responses. This delay could have also affected the way I conducted the interviews or analyzed the data because I did both over a longer stretch of time than I had anticipated. I mitigated this kind of drift by continuing to use the interview guide (see Appendix B) and fully examining each piece of data again after I collected the final journal.

As I noted in the section on Leaderboards' Usefulness in Chapter 4, I regret that I had combined leaderboards and progress indicators as a single gamification element. Although I differentiated between these elements during the interviews, I had not done so in the questionnaire. This makes some of the comments made on the questionnaires more ambiguous, leaving a small hole in the data I obtained about these particular elements of gamification.

Recommendations

Researchers should do more studies on the specific elements of gamification, paying particular attention to how effective they are in different subject areas and with various high school students. Each of these gamification elements have different

strengths and weaknesses that researchers should explore. In their studies, researchers should also focus on the ease of use of the different elements, hopefully discovering methods or programs that will make using gamification even easier.

Although I focused on six aspects of gamification in this study, there are many others that are worth exploring. Consequently, researchers should examine different educational uses of the same gamification element. As an example, researchers could conduct studies on points that students earn through different means, such as assignment completion, behavior, and specialized tasks. These studies could also examine how students use the points their teachers award them, such as towards a grade, to purchase a reward, as a group competition, etc.

While I focused on digital elements of gamification in this study, researchers should examine the effects of gamification elements that do not utilize digital technology. Although digital assets and techniques of gamification can enhance lessons and increase student engagement, they require time and expertise to prepare. They do not allow for much flexibility. Rarely can they replicate the "spontaneous gameplay" that a participant from Polar Bear School listed as a necessary element of gamification. Participants from all three schools had examples of nondigital ways that they used gamification that I could not pursue due to the design of this study. By researching nondigital elements of gamification, researchers would not just benefit students with limited access to technology but all students.

Implications

Results in this study suggested that high school teachers find at least some elements of gamification to overcome isolation and improve engagement for most high school students. As a teacher and a parent, the past year with the COVID-19 pandemic demonstrated that remote education increased the isolation of many students and decreased their motivation. Increasing understanding of gamification elements and how teachers can use them will help overcome these concerns with remote education and will help engage more students in their learning.

From a business angle, these results suggest that there is a need for high school centered gamification platforms. At present, most educational gamification platforms target either younger elementary and middle school students or older college students. Short of a complete gamification platform, more education applications should include elements of gamification, particularly progress indicators, digital achievements, and avatars. Currently, it is difficult to incorporate those gamification elements into a high school class easily.

On a district or school level, the results of this study indicate that the Bear School District needs to provide teachers with more, hopefully paid, time to research elements of gamification and collaborate with other teachers in developing effective gamification strategies. Several respondents suggested the creation of an intra-district team who could be the “go to” people in each school for ideas on how to effectively use gamification. Participants also mentioned the need to make the systems more user-friendly and easier to interact with one another. It would be especially beneficial to have a central reporting

and learning management platform that could pull data from a variety of sources without requiring too many steps for teachers and students to follow. Some participants also suggested creating a district-wide achievement system with standards-based achievements that the system would display where parents and students could easily access them.

Conclusion

I was excited as I conducted this study and discovered the varied ways that teachers in the Bear School District were already using gamification. I was fascinated as the educators I interviewed explained some of their ideas and feelings about various elements of gamification, which often made me reexamine my own thoughts on how educators can and should use different elements of gamification. I was impressed by how deeply these educators cared about their students and were looking for new ways to help them succeed.

Gamification and its various elements will not solve all the problems in education, not even all issues regarding student engagement. However, the results of this study indicate that gamification and its elements are beneficial in engaging student learning, and educators are already using them without fully understanding how they work. I cannot help but wonder how much more effective educators would be with a stronger understanding of these powerful tools and how they can most effectively use them. As many of the participants indicated, this is why educators need to take the time to learn more from one another and work together at crafting a better educational experience for their students.

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Appendix A: Questionnaire

Questionnaire: How Do You Use Games or Elements of Games in Your Teaching?

Thank you for taking the time to participate in this questionnaire. My name is Paul Marks, and I am researching how teachers in our district use games or the elements of games (a process called "gamification") in their teaching as part of my doctoral project for an Educational Doctorate in Educational Technology. I plan to use the data collected in these questionnaires directly. I will also use it to select candidates who would be willing to do a more in-depth interview and journal for this study. Completing this questionnaire does not obligate you to participate in the interview, nor guarantee that I will choose you as an interview candidate. I will keep all identifying information in this questionnaire confidential, and there will be no repercussions based on your participation, or lack of participation, with this study. If you wish to be removed from the study after submitting this questionnaire, please inform me immediately so that I can do so.

* Required

Email *

_____

A. Identification Information

1. Name: *

_____

2. School where you work: *

Check all that apply.

- [ ] [redacted]
- [ ] [redacted]
- [ ] [redacted]

Other: [ ] _____

4. 3. Grade level(s) you teach: *

Check all that apply.

- [ ] 9th Grade
- [ ] 10th Grade
- [ ] 11th Grade
- [ ] 12th Grade

5. 4. Subject(s) you teach: *

_____

6. 5. Number of years you have taught: *

_____

B. General questions about games and gamification in education

7. 1. How familiar are you with the term gamification and the ideas behind it? *

_____
_____
_____
_____
_____

8. 2. What role(s) do you believe games or elements of games can play in education, if any? *

_____
_____
_____
_____
_____

9. 3. To what extent do you use games or elements of games in your teaching? (e.g. Do you use them as part of the overarching structure for your classes? Do you use them with a particular class, unit, or lesson?) *

10. 4. How useful do you feel games or elements of games are in motivating students to participate in your classes? *

11. 5. How easy or difficult do you feel it is to add games or elements of games to your classes? (i.e. Does the level of work required make you feel that adding them is worth the effort?) *

C. Specific questions about elements of games and gamification in education

1. Points

"Points" are numerical rewards given to students for the completion of specific tasks or activities. They can be part of a grading system or some other reward system. Sometimes, points can take the form of an in-class currency which can be used to gain other rewards. They can also be part of a separate game or games that might be used in a class.

12. Do you use points (numerical rewards) as any part of your classes? (If you answered no, please skip to question 2). *

Mark only one oval.

- ◯ Yes
- ◯ No

13. a. How do you use them?

14. b. What types of technology do you use to award, maintain, or post these points?

15. c. How useful do you feel points are in motivating students to participate in your classes?

16. d. How easy or difficult do you feel it is to use points in your classes?

2. Leaderboards

"Leaderboards," at a minimum, post a current student "high score" or ranking with or without identifying information. They can also include other scores or ranks, such as where students are expected to be by the end of a unit or a term. Students are able to use the leaderboard to gauge their progress and position in the class.

17. Do you use leaderboards as any part of your classes? (If you answered no, please skip to question 3). *

Mark only one oval.

- ◯ Yes
- ◯ No

18. a. How do you use them?

19. b. What types of technology do you use to maintain or post these leaderboards?

20. c. How useful do you feel leaderboards are in motivating students to participate in your classes?

21. d. How easy or difficult do you feel it is to use leaderboards in your classes?

3. Achievements

"Achievements" are rewards other than points or grades that are usually given for students who have completed a specific task or set of tasks. These achievements can include tangible items such as pencils, stickers, or certificates; however, they can also include digital items such as digital badges or appearance modifications for an avatar.

22. Do you use achievements as any part of your classes? (If you answered no, please skip to question 4). *

Mark only one oval.

- ◯ Yes
- ◯ No

23. a. How do you use them?

24. b. What types of technology do you use to award, maintain, or post these achievements?

25. c. How useful do you feel achievements are in motivating students to participate in your classes?

26. d. How easy or difficult do you feel it is to use achievements in your classes?

4. Avatars

"Avatars" are characters that represent students in a class. They can be a role that a student "plays" in your class or a digital representation of themselves. These avatars may have customizable portions of their appearance that students can freely choose. Sometimes, students must complete specific tasks for certain customization options to be available.

27. Do you use avatars as any part of your classes? (If you answered no, please skip to question 5). *

Mark only one oval.

- ◯ Yes
- ◯ No

28. a. How do you use them?

29. b. What types of technology do you use to maintain these avatars?

30. c. How useful do you feel avatars are in motivating students to participate in your classes?

31. d. How easy or difficult do you feel it is to use avatars in your classes?

5. Freedom To Fail

"Freedom to fail" allows students multiple paths to success or multiple attempts to master a skill or complete a task. This is in the place of students only having one opportunity to earn a grade or credit (e.g. an AP exam). This idea is sometimes referred to as "extra lives" or "multiple lives."

32. Do you use freedom to fail as any part of your classes? (If you answered no, please skip to question 6). *

Mark only one oval.

- ◯ Yes
- ◯ No

33. a. How do you use it?

34. b. What types of technology do you use to maintain a freedom to fail in your classes?

35. c. How useful do you feel a freedom to fail system is in motivating students to participate in your classes?

36. d. How easy or difficult do you feel it is to use a freedom to fail system in your classes?

6. Narratives

"Narratives" are story elements, such as plot advancement or character development, that are tied to actions taken and tasks completed by students. An example of this is the "Living History" curriculum where students are put into the roles of historical figures as part of a social studies course.

37. Do you use narratives in this way as any part of your classes? (If you answered no, please skip to section D). *

Mark only one oval.

- Yes
- No

38. a. How do you use them?

39. b. What types of technology do you use to maintain these narratives?

40. c. How useful do you feel using narratives in this way is in motivating students to participate in your classes?

41. d. How easy or difficult do you feel it is to use narratives in this way in your classes?

D. Additional Question

42. Would you be willing to take part in an online interview to provide further information for this research project? Your answer does not indicate a commitment on your part nor a guarantee that you will be selected to participate further. *

Mark only one oval.

- Yes
- No

E. Thank You

I deeply appreciate the help you have given me in my research by filling out this questionnaire. I hope that your school year continues to go smoothly. If you have indicated that you are willing to further participate in this research study, I will send you an email regarding your possible role and what it entails. Again, thank you so much for providing this information.

Appendix B: Interview Guide

Interview Guide

I want to thank you again for taking part in this research study and agreeing to do this interview. Before I go further, I want to remind you that my name is Paul Marks and that I am conducting this research study as part of my doctoral project for an Educational Doctorate in Educational Technology at Walden University. I am recording this interview and will have it transcribed. I will also take notes as we go. Once I complete my analysis, I will share it with you for any clarifications you would like to make. If, at any point, you feel uncomfortable with this interview or study, you can let me know, and I will delete any information that I have from you and your responses. There will be no repercussions to you for choosing to leave the study.

I will not be using any information about your identity in my dissertation. If I do refer directly to any of your responses, I will use a pseudonym. All identification information will remain in locked files to which only I have access, and I will delete that information after the five-year period required for data verification purposes by my university.

Do you have any questions so far?
[If yes, address any questions; otherwise, proceed to the next question.]

Are you still willing to take part in this interview?

[If no, make certain it was a serious response. If so, thank them for their time and conclude the interview. Otherwise, continue to section A]

A. Identifying information

For the record, would you please identify yourself and your role in the district?
[Ask questions if there is any need for clarification].

B. General questions about games and gamification in education

The purpose of my study is to discover the extent to which teachers in an Alaskan school district are using gamification as a means of increasing student motivation. I am specifically looking to discover the extent to which digital elements of gamification are being used, as well as how teachers perceive the usefulness and ease of use of these different elements in increasing student motivation.

1. I saw on your questionnaire that you were familiar/unfamiliar [depending on questionnaire response] with the term of gamification. [If familiar, move to c].
a. Has that changed since you filled out the questionnaire? [If yes, move to c].
b. Would you like an explanation about what gamification is and how it can be used in education? [Respond as needed and move to 2.]
c. How did you learn about gamification?

2. You stated that games or elements of games [use information from the questionnaire regarding roles].
a. Has that changed since you filled out the questionnaire? [If no, move to c.]
b. How?
c. Why do you feel that gamification can play those roles?
d. What else would you like to add?

3. You also wrote that [use information from the questionnaire regarding the extent to which they use gamification].
a. Has that changed since you filled out the questionnaire? [If no, move to c.]
b. How?
c. What are some ways that you might want to use gamification in the future?

d. What else would you like to add?

4. Regarding the usefulness of gamification in motivating students in your classes, you said, [use information from the questionnaire regarding usefulness of gamification].
a. Has that changed since you filled out the questionnaire? [If no, move to c.]
b. How?
c. Why do you think it motivates/does not motivate them?

d. What else would you like to add?

5. Concerning the ease or difficulty of using gamification in your classes, you said [use information from the questionnaire regarding ease of use of gamification].
a. Has that changed since you filled out the questionnaire? [If no, move to c.]
b. How?
c. What do you feel might help make implementing gamification in your classes easier?

d. What else would you like to add?

C. Specific questions about elements of games and gamification in education
I would like to ask you some questions regarding the more specific elements of gamification that were mentioned in the questionnaire.

[For any of the questions in this section of the questionnaire that they answered no, ask if have used them since.
If not, ask if they would like to learn more about them or if they would be interested in using them in the future. If they are interested, follow that with why and their thoughts about the ease of use and usefulness of each one.
Follow the script for any elements where they answered yes.
Otherwise, proceed to section D.]

1. When you use "points" as a part of your classes, how do students earn points? How are students informed that they have earned points? How are they made aware of their point total?

[Use their questionnaire answers and find out more about their responses to a through d.]

2. When you use "leaderboards" as a part of your classes, where are they posted? What information do you include?

[Use their questionnaire answers and find out more about their responses to a through d.]

3. When you use "achievements" as a part of your classes, how do students learn about how they can earn achievements? How do students find out that they have earned achievements?
[Use their questionnaire answers and find out more about their responses to a through d.]

4. When you use "avatars" as a part of your classes, how do students create and customize their avatars?
[Use their questionnaire answers and find out more about their responses to a through d.]

5. When you use "freedom to fail" as a part of your classes, how often do students take advantage of your policy?
[Use their questionnaire answers and find out more about their responses to a through d.]

6. When you use "narratives" as a part of your classes, how do you determine what type of story, plot, setting, or characters to use for your students?

[Use their questionnaire answers and find out more about their responses to a through d.]

7. What other elements of gamification do you use other than the six that I have mentioned?
[If there are any, ask for elaboration and discuss usefulness and ease of use.]

D. Additional Question

To help get a complete picture of the extent that digital elements of gamification are used in an Alaska school district, I would like you to complete a two-week data collection journal starting on your next school day.

[If the journal template has not already been sent to the participant's email, send it now.] In your email is a template for the journal. If you have any questions about it, I would like to answer them now. If you have questions later, please contact me as soon as possible so I can answer them for you.

In general, the idea is for you to account for the different elements of gamification you have used on a particular day, record what they were (if any) and write a short reflection about their ease of use and usefulness for motivating students in your classes. If you use the same element in the same way for more than one day, you can refer back to the first entry with it; however, please note any differences in the use, ease of use, or usefulness of them.

E. Thank You

I deeply appreciate the help you have given me in my research by taking part in this interview and agreeing to complete the data collection journal. I look forward to seeing your journal responses in two weeks, and I will have the transcription of this interview ready for you to review at that time. Please do not hesitate to contact me with any questions, concerns, or comments about this research study.

Appendix C: Journal Template

Two-week Journal Template for Paul Marks' Research Study on Gamification

Thank you once again for helping with my research study concerning the extent that teachers use elements of gamification to motivate students in an Alaskan school district.

Feel free to organize this journal in the way that best suits your needs. The primary purpose of this data collection journal is to see how you use elements of gamification on a daily basis. I am particularly interested in what types of technology you use for each element, how easy or difficult it is for you to use, and how useful you feel each element is for motivating students.

As this is a two-week journal, there are a total of eleven entries: one for each school day and a final entry for overall reflection. Feel free to include any other additional information that you feel would be beneficial for this study. Please do not hesitate to call me if you have any questions or concerns about this journal or any part of this research study.

When you have completed this journal, please email it to me at XXXXXXXX using a personal email account rather than a school account to help ensure your confidentiality. The district can access anything that you send through your school email or school accounts.

Day One

Name:
Date:
Day of the Week:

Which of the following elements of gamification did you use today: achievements, avatars, freedom to fail, leaderboards, narratives, points, or some other element (please describe)?

How did you use them?

What technology did you use?

How effective do you feel each element used was in motivating students to participate in your class? Why?

How easy or difficult was it for you to use each element in your class? Why?

What additional comments would you like to share?

Day Two

Date:
Day of the Week:

Which of the following elements of gamification did you use today: achievements, avatars, freedom to fail, leaderboards, narratives, points, or some other element (please describe)?

How did you use them?

What technology did you use?

How effective do you feel each element used was in motivating students to participate in your class? Why?

How easy or difficult was it for you to use each element in your class? Why?

What additional comments would you like to share?

Day Three

Date:
Day of the Week:

Which of the following elements of gamification did you use today: achievements, avatars, freedom to fail, leaderboards, narratives, points, or some other element (please describe)?

How did you use them?

What technology did you use?

How effective do you feel each element used was in motivating students to participate in your class? Why?

How easy or difficult was it for you to use each element in your class? Why?

What additional comments would you like to share?

Day Four

Date:
Day of the Week:

Which of the following elements of gamification did you use today: achievements, avatars, freedom to fail, leaderboards, narratives, points, or some other element (please describe)?

How did you use them?

What technology did you use?

How effective do you feel each element used was in motivating students to participate in your class? Why?

How easy or difficult was it for you to use each element in your class? Why?
What additional comments would you like to share?

Day Five
Date:
Day of the Week:

Which of the following elements of gamification did you use today: achievements, avatars, freedom to fail, leaderboards, narratives, points, or some other element (please describe)?

How did you use them?

What technology did you use?

How effective do you feel each element used was in motivating students to participate in your class? Why?

How easy or difficult was it for you to use each element in your class? Why?

What additional comments would you like to share?

Day Six

Date:
Day of the Week:

Which of the following elements of gamification did you use today: achievements, avatars, freedom to fail, leaderboards, narratives, points, or some other element (please describe)?

How did you use them?

What technology did you use?

How effective do you feel each element used was in motivating students to participate in your class? Why?

How easy or difficult was it for you to use each element in your class? Why?

What additional comments would you like to share?

Day Seven

Date:
Day of the Week:

Which of the following elements of gamification did you use today: achievements, avatars, freedom to fail, leaderboards, narratives, points, or some other element (please describe)?

How did you use them?

What technology did you use?

How effective do you feel each element used was in motivating students to participate in your class? Why?

How easy or difficult was it for you to use each element in your class? Why?

What additional comments would you like to share?

Day Eight

Date:
Day of the Week:

Which of the following elements of gamification did you use today: achievements, avatars, freedom to fail, leaderboards, narratives, points, or some other element (please describe)?

How did you use them?

What technology did you use?

How effective do you feel each element used was in motivating students to participate in your class? Why?

How easy or difficult was it for you to use each element in your class? Why?

What additional comments would you like to share?

Day Nine

Date:
Day of the Week:

Which of the following elements of gamification did you use today: achievements, avatars, freedom to fail, leaderboards, narratives, points, or some other element (please describe)?

How did you use them?

What technology did you use?

How effective do you feel each element used was in motivating students to participate in your class? Why?

How easy or difficult was it for you to use each element in your class? Why?

What additional comments would you like to share?

Day Ten

Date:
Day of the Week:

Which of the following elements of gamification did you use today: achievements, avatars, freedom to fail, leaderboards, narratives, points, or some other element (please describe)?

How did you use them?

What technology did you use?

How effective do you feel each element used was in motivating students to participate in your class? Why?

How easy or difficult was it for you to use each element in your class? Why?

What additional comments would you like to share?

Reflection

What do you feel you have learned from this experience?

What are your thoughts about the value of gamification in education?

What steps should our district take to help increase student motivation?

What additional comments would you like to share?

Appendix D: Dr. C. Ermold's Expert Panel Validation Form

Survey/Interview Validation Rubric for Expert Panel - VREP©
By Marilyn K. Simon with input from Jacquelyn White

http://dissertationrecipes.com/

Criteria	Operational Definitions	Score **1=Not Acceptable** (major modifications needed) **2=Below Expectations** (some modifications needed) **3=Meets Expectations** (no modifications needed but could be improved with minor changes) **4=Exceeds Expectations** (no modifications needed)				Questions NOT meeting standard (List page and question number) and need to be revised. *Please use the comments and suggestions section to recommend revisions.*
		1	2	3	4	
Clarity	• The questions are direct and specific. • Only one question is asked at a time. • The participants can understand what is being asked. • There are no *double-barreled* questions (two questions in one).			X		Section C questions could have greater clarity if they were broken out in a manner consistent with other sections. For example, C1. When you use "points" as part of your classes, how are students informed that they have earned points?" C1a. How do students earn points? C1b. How are students informed that they have earned points? C1c. How are they made aware of their point total?
Wordiness	• Questions are concise. • There are no unnecessary words			X		See suggested edits in document (to follow.)
Negative Wording	• Questions are asked using the affirmative (e.g., Instead of asking, "Which methods are			X		

	not used?", the researcher asks, "Which methods *are* used?")					
Overlapping Responses	• No response covers more than one choice. • All possibilities are considered. • There are no ambiguous questions.		X			Consider breaking the structure of question C6 into a-d segments for greater clarity and improved organization. While it may seem redundant now, I suspect some respondents will have given more thought to some narrative elements and no thought to others. Keeping that information clear in your questioning and data on the front end may be helpful on the backend.
Balance	• The questions are unbiased and do not lead the participants to a response. The questions are asked using a neutral tone.		X			Question C2a suggests that the use of leaderboards do present FERPA issues (see Owasso ISD vs. Falvo's U.S. Supreme Court ruling, as one example .) The question as currently written will confuse some respondents, and those who think they "should know" will be too embarrassed to ask for clarification, and then study results may be misleading on the way teachers in an

						Alaskan school district are using leader boards in their instruction.
Use of Jargon	• The terms used are understandable by the target population. • There are no clichés or hyperbole in the wording of the questions.			X		Participants would be well supported by your development of a one page visual guide to the elements of gamification they could refer to during each stage of the survey and the journal completion. If not already created by another researcher, this visual guide (which you would include as an appendix) could also become a lasting tool that helps vault your research into increased practical application.
Appropriateness of Responses Listed	• The choices listed allow participants to respond appropriately. • The responses apply to all situations or offer a way for those to respond with unique situations.				X	A particular strength of the survey and survey structure is that study participants will complete the first survey round on their own, and then have time between completing the initial survey and doing the initial interview with the researcher. This provides the respondent with time to think further about

						their practice and potentially notice aspects of gamification in use that they did not previously *realize* were gamification. Further, the follow up interview allows them to adjust their survey answers to accommodate that realization.
Use of Technical Language	• The use of technical language is minimal and appropriate. • All acronyms are defined.			X		
Application to Praxis	• The questions asked relate to the daily practices or expertise of the potential participants.			X		
Relationship to Problem	• The questions are sufficient to resolve the problem in the study • The questions are sufficient to answer the research questions. • The questions are sufficient to obtain the purpose of the study.		X			Under question C4, consider asking how teachers monitor the appropriateness of student avatars or names. Question C7 follow-ups should be written to follow the same general structure as the previous question patterns, e.g., "What specific elements do you incorporate in your planning to support that method of gamification? How do you engage students in monitoring their
						progress utilizing that method of gamifcation?" Section D needs to be edited to follow the same format as the earlier sections of the survey script. In its current form, it appears to lack the spacing afforded to the introductions and sections A-C. Since other researchers may make use of your tool in years to come, it's important it be visually consistent and as user-friendly as possible.

Comments and Suggestions

Types of Validity

VREP is designed to measure face validity, construct validity, and content validity. To establish criterion validity would require further research.

Face validity is concerned with how a measure or procedure appears. Does it seem like a reasonable way to gain the information the researchers are attempting to obtain? Does it seem well designed? Does it seem as though it will work reliably? Face validity is independent of established theories for support (Fink, 1995).

Construct validity seeks agreement between a theoretical concept and a specific measuring device or procedure. This requires operational definitions of all constructs being measured.

Content Validity is based on the extent to which a measurement reflects the specific intended domain of content (Carmines & Zeller, 1991, p.20). Experts in the field can determine if an instrument satisfies this requirement. Content validity requires the researcher to define the domains they are attempting to study. Construct and content validity should be demonstrated from a variety of perspectives.

Criterion related validity, also referred to as instrumental validity, is used to demonstrate the accuracy of a measure or procedure by comparing it with another measure or procedure which has been demonstrated to be valid. If after an extensive search of the literature, such an instrument is *not* found, then the instrument that meets the other measures of validity are used to provide criterion related validity for future instruments.

Operationalization is the process of defining a concept or construct that could have a variety of meanings to make the term measurable and distinguishable from similar concepts. Operationalizing enables the concept or construct to be expressed in terms of empirical observations. Operationalizing includes describing what is, and what is not, part of that concept or construct.

References

Carmines, E. G. & Zeller, R.A. (1991). *Reliability and validity assessment*. Newbury Park: Sage Publications.

Fink, A., ed. (1995). *How to measure survey reliability and validity v. 7*. Thousand Oaks, CA: Sage.

Appendix E: Dr. S. Bezdecny's Expert Panel Validation Form

Survey/Interview Validation Rubric for Expert Panel - VREP©
By Marilyn K. Simon with input from Jacquelyn White

http://dissertationrecipes.com/

Criteria	Operational Definitions	Score **1=Not Acceptable** (major modifications needed) **2=Below Expectations** (some modifications needed) **3=Meets Expectations** (no modifications needed but could be improved with minor changes) **4=Exceeds Expectations** (no modifications needed)				**Questions NOT meeting standard (List page and question number) and need to be revised.** ***Please use the comments and suggestions section to recommend revisions.***
		1	2	3	4	
Clarity	• The questions are direct and specific. • Only one question is asked at a time. • The participants can understand what is being asked. • There are no *double-barreled* questions (two questions in one).			X		Questionaire: Section C
Wordiness	• Questions are concise. • There are no unnecessary words				X	
Negative Wording	• Questions are asked using the affirmative (e.g., Instead of asking, "Which methods are not used?", the researcher asks, "Which methods *are* used?")				X	
Overlapping Responses	• No response covers more than one choice. • All possibilities are considered. • There are no ambiguous questions.		X			Questionaire: Sections B and C
Balance	• The questions are unbiased and do not lead the participants to a response. The questions are asked using a neutral tone.				X	
Use of Jargon	• The terms used are understandable by the target population. • There are no clichés or hyperbole in the wording of the questions.				X	
Appropriateness of Responses Listed	• The choices listed allow participants to respond appropriately. • The responses apply to all situations or offer a way for those to respond with unique situations.		X			Questionaire: Sections B and C
Use of Technical Language	• The use of technical language is minimal and appropriate. • All acronyms are defined.				X	
Application to Praxis	• The questions asked relate to the daily practices or expertise of the potential participants.				X	
Relationship to Problem	• The questions are sufficient to resolve the problem in the study • The questions are sufficient to answer the research questions. • The questions are sufficient to obtain the purpose of the study.			X		Questionaire: Section B and C

Comments and Suggestions

I had no issues or suggestions about the journal template.

I had no issues or suggestions with the interview guide.

On the questionnaire, section C, the sub-questions (i.e. question C1a, C2B, etc.) should be expanded to increase clarity. Don't be afraid to increase redundancy in your questions.

On the questionnaire, sections B and C, I feel many questions (those that begin with "To what extent…", "How useful…", or "How easy or difficult…" would benefit by providing the respondent with "stock" answers. For example, "How useful do you feel games or elements of games are in motivating students to participate in your classes? 1 – not useful 2 – somewhat useful 3 – very useful 4 – extremely useful ." I believe this will reduce huge variations in possible answers, make statistical analysis of the results of the questionnaire possible/easier, and make completing the questionnaire easier therefore increaseing the chances of respondents completing it. More in depth responses can still be obtained by those respondents who agree to the interview.

Types of Validity

VREP is designed to measure face validity, construct validity, and content validity. To establish criterion validity would require further research.

Face validity is concerned with how a measure or procedure appears. Does it seem like a reasonable way to gain the information the researchers are attempting to obtain? Does it seem well designed? Does it seem as though it will work reliably? Face validity is independent of established theories for support (Fink, 1995).

Construct validity seeks agreement between a theoretical concept and a specific measuring device or procedure. This requires operational definitions of all constructs being measured.

Content Validity is based on the extent to which a measurement reflects the specific intended domain of content (Carmines & Zeller, 1991, p.20). Experts in the field can determine if an instrument satisfies this requirement. Content validity requires the researcher to define the domains they are attempting to study. Construct and content validity should be demonstrated from a variety of perspectives.

Criterion related validity, also referred to as instrumental validity, is used to demonstrate the accuracy of a measure or procedure by comparing it with another measure or procedure which has been demonstrated to be valid. If after an extensive search of the literature, such an instrument is *not* found, then the instrument that meets the other measures of validity are used to provide criterion related validity for future instruments.

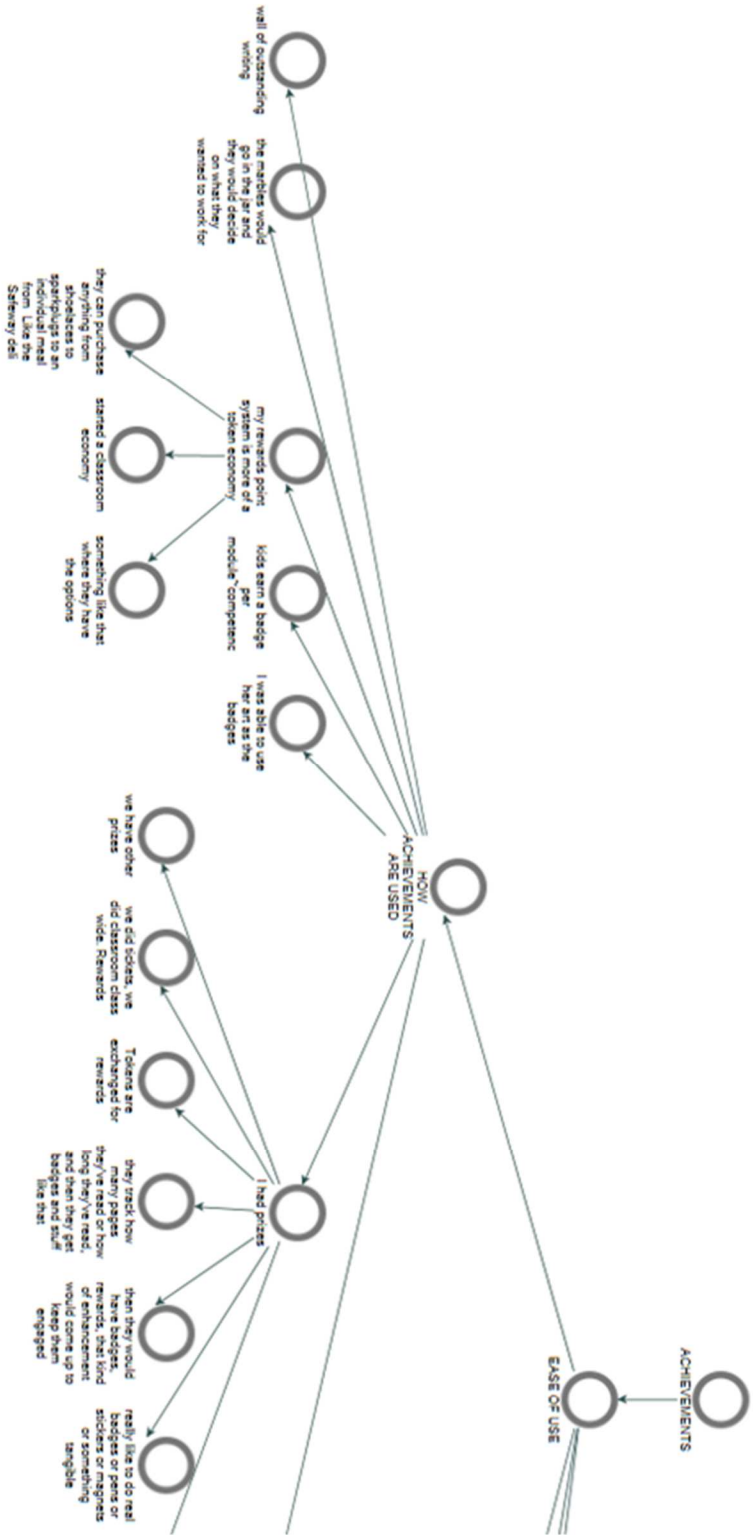
Operationalization is the process of defining a concept or construct that could have a variety of meanings to make the term measurable and distinguishable from similar concepts. Operationalizing enables the concept or construct to be expressed in terms of empirical observations. Operationalizing includes describing what is, and what is not, part of that concept or construct.

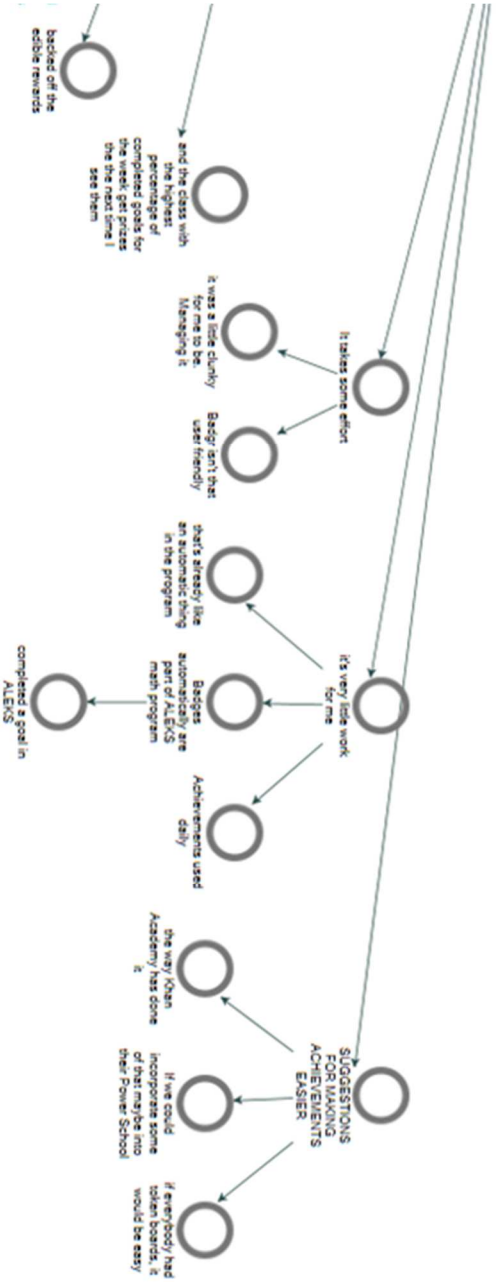
References

Carmines, E. G. & Zeller, R.A. (1991). *Reliability and validity assessment*. Newbury Park: Sage Publications.

Fink, A., ed. (1995). *How to measure survey reliability and validity v. 7*. Thousand Oaks, CA: Sage.

Appendix F: Visualization of Codes Organized Under Achievements: Ease of Use




backed off the edible rewards
end the class with the highest percentage of completed goals for the week get prizes like the next time I see them
it was a little clunky for me to be managing it
Baddy isn't that user friendly
It takes some effort
that's already like an automatic thing in the program
Badges automatically are part of ALEKS math program
completed a goal in ALEKS
it's very little work for me
Achievements used daily
the way Khan Academy has done it
If we could incorporate some of that maybe into their Power School
if everybody had token boards, it would be easy
SUGGESTIONS FOR MAKING ACHIEVEMENTS EASIER

Appendix G: Visualization of Cases Query for Achievements: Useful