AN EXPLORATION OF DIGITAL GAMIFICATION ON MIDDLE SCHOOL BAND STUDENTS’ PRACTICE HABITS

By

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS ............................................................................................................. 3

LIST OF TABLES ....................................................................................................................... 7

LIST OF FIGURES ..................................................................................................................... 8

ABSTRACT .................................................................................................................................. 9

CHAPTER

1 INTRODUCTION ...................................................................................................................... 11

Gamification of Learning ........................................................................................................... 12
Digital Gamification and Music Education ................................................................................ 14
Statement of the Problem ......................................................................................................... 15
Purpose of the Study .................................................................................................................. 15
Limitations of the Study .......................................................................................................... 16
Definition of Terms ................................................................................................................... 16

2 REVIEW OF THE LITERATURE .......................................................................................... 18

Practicing Music ....................................................................................................................... 18
Deliberate Practice ..................................................................................................................... 19
  Practice organization ............................................................................................................... 19
  Goal-based practice ............................................................................................................... 21
Motivation and Practice .......................................................................................................... 24
  Goal theory ........................................................................................................................... 25
  Achievement goal theory ...................................................................................................... 25
  Self-regulation theory .......................................................................................................... 28
  Self-determination theory .................................................................................................... 29
Gamification .............................................................................................................................. 30
  Digital Gamification in Education ......................................................................................... 34
    Digital game-based learning ............................................................................................... 38
    Classcraft ............................................................................................................................ 39
    Perspectives on digital gamification in learning ................................................................. 42
    Digital games and game-based learning within music education .................................... 44
    Motivation through digital gamification ............................................................................ 48
Summary of the Chapter .......................................................................................................... 51

3 METHODOLOGY .................................................................................................................... 53

Research Questions .................................................................................................................. 53
Research Approach and Theoretical Framework ..................................................................... 53
Embedded Mixed-Methods ...................................................................................................... 53
4 RESULTS

Digital Gamification and Motivation to Practice .............................................. 77
  Questionnaire Results ...................................................................................... 77
  Improving Through Practice ............................................................................. 80
  Feeling Good About One’s Self .......................................................................... 83
  Discovering New Things to Practice ................................................................. 84
  Field Note Observations and Practice Charts ................................................. 85
Using Digital Gamification to Teach Students How to Practice Effectively ........ 86
  Questionnaire Results ...................................................................................... 86
  Practice Charts ................................................................................................. 90
  Goal Setting ...................................................................................................... 91
  Practice Strategies .......................................................................................... 92
Students’ and Teacher’s Attitudes and Perceptions of the Digital Gamification Process ............................................................................................................. 94
  Questionnaire Results ...................................................................................... 94
  Analytics and Fidelity of Implementation ........................................................... 96
  Learning Through Video Games ....................................................................... 98
  Dangers of Use ................................................................................................. 100
Summary of the Results .................................................................................... 103

5 DISCUSSION

Digital Gamification and Motivation to Practice .............................................. 105
  Practice Time .................................................................................................... 105
  Motivation to Practice ...................................................................................... 106
Using Digital Gamification to Teach Students How to Practice Effectively .......... 110
  Knowledge and Application of Research-Based Practice Strategies ............... 110
Students’ and Teacher’s Attitudes and Perceptions of the Digital Gamification Process ............................................................................................................. 114
  Gaming Time ................................................................................................... 114
  Attitudes and Perceptions of Digital Gamification ............................................ 114
  Limitations of the Study ................................................................................... 118
  Pedagogical Implications and a Suggestion for Future Research ..................... 119
Conclusions.......................................................................................................... 121
APPENDIX

A  IRB PROTOCOL SUBMISSION .................................................................123
B  TEACHER’S INVITATION TO PARTICIPATE .............................................127
C  LETTER OF INTENT TO THE PRINCIPAL ..............................................128
D  INFORMED CONSENT FOR INSTRUCTOR ..............................................129
E  INFORMED CONSENT FOR PARENT OR GUARDIAN ................................130
F  INFORMED ASSENT FOR STUDENTS ...................................................131
G  TABLE OF SPECIFICATIONS ...................................................................132
H  THE MUSICAL PRACTICE AND DIGITAL GAMIFICATION QUESTIONNAIRE (MPDGQ) .................................................................................................134
I  STUDENT FOCUS GROUP INTERVIEW PROTOCOL ..................................151
J  TEACHER INTERVIEW PROTOCOL .........................................................153
K  RUBRIC FOR SELF-ASSESSMENT ..........................................................155
REFERENCES .............................................................................................156
BIOGRAPHICAL SKETCH ............................................................................170
LIST OF TABLES

Table                                                                                                          Page
3-1  Participating band class makeup. ..................................................................................................................58
3-2  A table of the gamified elements employed in the study’s Classcraft unit. ..................................65
3-3  Sample of a Goal-Based Practice Chart. Bauer (2016) ...........................................................................68
4-1  Questionnaire Motivation Items. ..................................................................................................................80
4-2  Number of Practice Chart Submissions per week. .......................................................................................86
4-3  Section III – Knowledge of Practice Strategies. .........................................................................................87
4-4  Mean Rank of Practice Strategies - Rhythms. ..............................................................................................89
4-5  Mean Rank of Practice Strategies – Fast Sections. .......................................................................................89
4-6  Mean Rank of Practice Strategies – Longer and More Difficult Music. ......................................................89
4-7  Mean Rank of Practice Strategies – Error Prevention. ...............................................................................90
4-8  Reported Uses of Practice Strategies through the Practice Chart Submissions. .................................92
4-9  Beliefs about Digital Gamification. ............................................................................................................96
4-10 Number of Student Players at a Certain Experience Level at the end of the Classcraft Quests. ..........97
4-11 Gamification Elements through Analytics from the End of the Classcraft Quests. ..............................98
## LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-1</td>
<td>73</td>
</tr>
</tbody>
</table>

The research questions and their corresponding data sources and analyses.
The purpose of this study was to explore the potential of using digital gamification to motivate and develop middle school band students’ understanding of musical practice. Specific research questions included: (1) Does digital gamification affect band students’ motivation to practice?; (2) Can digital gamification be used to teach students how to practice effectively?; and (3) What are the students’ and teacher’s attitudes and perceptions of the digital gamification process? During a five-week, mixed-methods case study, middle school band students ($n = 16$) engaged in a music practice unit developed in the Classcraft (2013) educational online platform while simultaneously participating in their regular band class activities. The researcher-developed *Music Practice and Digital Gamification Questionnaire* (MPDGQ) was administered prior to beginning the unit and then again at its conclusion. Qualitative data—the researcher’s journal, two student focus groups, and an interview with the band director—were also collected and analyzed.

Statistically, there were no overall significant changes found over the course of the study in the participants’ motivation to practice, knowledge of practice strategies, or attitudes and perceptions regarding the digital gamification process. However, certain MPDGQ items that
were highly rated were of interest, and qualitative data suggested that the activities of the study may have impacted some students. For instance, the most highly rated motivational finding concerned the item “I enjoy when I improve some of my weak points” ($M = 4.27$, $SD = .80$). This rating seemed to align with both focus group participants’ beliefs that the Classcraft activities and goal-based practice chart process increased their desire to engage in practice and improve their musical skills. In addition, a significant increase was found between the pre- and post-test means of “I would feel bad if I was not taking time to practice.” The participants in both focus groups stated that they felt a sense of responsibility to practice prior to performances. A significant increase was also found between the pre- and post-test ratings of the item “I believe I can learn something useful from a video game.” Additional findings are described. Implications for music pedagogy and future research are discussed.
CHAPTER 1
INTRODUCTION

Practice is essential for musical and technical growth on an instrument. For instrumental music students to develop technical proficiency, develop as expressive performers, and grow in other ways as musicians, practicing must take place on a consistent basis, over time (Barry & Hallam, 2002). However, young instrumentalists are often faced with physiological, cognitive, motivational, and social obstacles related to practicing. This means that it is incumbent upon music educators to assist their students in overcoming these difficulties.

When scholars discuss musical practice, they most often are referring to deliberate practice, which can be defined as a:

…structured activity, often designed by teachers or coaches, with the explicit goal of increasing an individual’s current level of performance. In contrast to work and play, it requires the generation of specific goals for improvement and the monitoring of various aspects of performance. Furthermore, deliberate practice involves trying to exceed one’s previous limits, which requires full concentration and effort. Consequently, it is only possible to engage in these activities for a limited amount of time until rest and recuperation are needed (Ericsson & Lehmann, 1999, p. 695).

Engagement in deliberate practice does not come naturally to most young musicians. Researchers have investigated a variety of factors that may affect young instrumentalists’ practice, including motivation (Austin & Berg, 2006; Miksza, 2007, 2012; Perez, 2011; Schatt, 2013), elements of cognition (Barry & Hallam, 2002; Bauer, 2008), and the quality of practice (Drayton, 2013; Holmes-Davis, 2015; Kolthammer, 2009; Oare, 2007). Despite what is known about effective practice, instrumental music teachers are often find helping their students to learn and utilize effective practice strategies and procedures challenging. While a number of approaches have been proposed, the problem of teaching and motivating students to practice persists.
Gamification of Learning

According to the Oxford English Dictionary, the word game is traced to the Germanic gæmen and the Old English gæmnian; both words revolve around the concepts of joy, jokes, pleasure, mockery, amusement, fun, and play (“Game,” 2018). Another definition of the word would signify its usage for indoor and outdoor activities played for entertainment and fun through the use of set rules and regulations (“Game,” 2018). Both of the preceding definitions of the word “game” address its hand-in-hand connection to the word and the concept of play, an activity or nature of engagement that provides some sense of fun or enjoyment (“Play,” 2018).

When considering the parallels between the words, both "game" and "play" involve the notion of fun or a basis of entertainment and pleasurable experiences (“Fun,” 2018). The appeal that recreational games developed throughout history involve their approaches to generate fun through appropriate experiences of play. Via the nature of game-play, humans can enjoy engagements that are fun on individual levels, yet also appease the social benefits of group activities regardless of gender and preferences (Little, 2015; Mazzo, 2015; Van Rheenen, 2015). Those experiences may also involve a game's potential for enabling Csikszentmihalyi's (1990) theory of flow experiences in which involved participants are fully immersed within the enjoyment of the activities (Campbell, 2016; Kallevig, 2015; Koops, 2017; Roberts 2015).

Perhaps the most popular form of games today are video games. Played on dedicated commercial platforms, computers, tablets, and phones, many people, from young to old, seem to enjoy the recreation and challenge of digital video games (Biel, 2016; de Waal, 1995; Hakimi, 2017; Nichols, 2005; Pelletier-Gagnon, 2011). Well-designed video games are structured in a way that the user clearly understands the goal that he or she is to accomplish (de Waal, 1995; Garrelts, 2003; Van Rheenen, 2012). They utilize a level of challenge that is achievable, but not too easy (may result in boredom), or hard (could cause frustration). A certain level of
concentration becomes necessary to be successful in the game, and as the user makes progress, he or she may receive badges or other rewards to acknowledge that progress (de Waal, 1995; Rieber, 1996; Jacob, 2016; Pisano, 2018).

Researchers have studied the appeal of video games, identifying a number of their key attributes. These findings have been applied to various aspects of life, including business, public relations, and education. In education, the gamification of learning involves using some of the essential elements of gameplay, such as achievable goals, challenges to proceed through various levels, and badges to acknowledge achievement, in the design of learning experiences. (Bell, 2014; Biel, 2016; Campbell, 2016; Hamari, Kovisto, & Sarsa, 2014; Harold, 2015; Hudiburg, 2016; Hulsey, 2015; Hsu, 2016; Jacob, 2016; Kallevig, 2015; Laborde Torres, 2016; McFarland, 2017, Pisano, 2018; Pratskevich, 2014; Sierra, 2013; Stoke, 2014; Zurek, 2017). Gamification has allowed educators to specifically track student growth across multiple academic subjects, including math, science, social sciences, and natural sciences (Anderson, 2008). The process of gamification also helped students, especially those within the Millennial generation, develop critical thinking and social skills (Banfield & Wilkerson, 2014, Mazzo, 2015). It also has been found to make the acquisition of knowledge fun through engagement, promoting a sense of completion, and facilitating motivation; elements that are important to student learning (Huang & Soman, 2013).

The total immersion and learning present within and outside video game play and gamified experiences are very much in line with the nature of learning through play via flow experiences (de Waal, 1995; Rieber, 1996; Jacob, 2016; Pisano, 2018). Over the past two decades, there have been studies on teachers integrating video games and game-like mobile applications into instruction, hence the digital gamification of music learning (Anderson, 2008;
These past studies examined ways in which digital gamification could be used in the classroom and the effect it had on students' learning, with findings that suggested it could have substantial effects on many aspects of education. Some scholars believe that this type of digital learning may provide a new approach to learning, teaching, and assessment in schools that can greatly impact students’ motivation and achievement (Criswell 2009; Feola, 2010; Hungate, 2016; McAlister, 2013; Reyher, 2014). In music, this potential deserves attention since advancing video game technology could be used to introduce and develop some musical concepts more effectively than ever before.

**Digital Gamification and Music Education**

Within music education, technology is receiving a great deal of attention as an instructional tool to facilitate student learning (Bauer, 2014; Claussen, 2017; Criswell, 2009; Feola, 2010; Hungate, 2016; Kassner, 2006; Kersten, 2006; Kirk, 2010; Mishra & Koehler, 2006; McAlister, 2013; Nielsen, 2013; Paney, 2015; Reyher, 2014; Richardson & Kim, 2011, Riley, 2013; Summers & Hannigan, 2016; Wagner, 2017). Video games and mobile gaming applications have been used to promote a new sense of engaged learning among student musicians (Criswell, 2009; Hoffman, 2009; Kassner, 2006; Marić, 2015; Mercer, 2009; Nardo, 2010; Paney, 2015; Reyher, 2014). There have also been a small number of studies that have investigated possible implications of using music video games or within music classrooms (Gomes et al., 2014; Gower & McDowall, 2012; Little, 2015; Richardson & Kim, 2011; Orosco, 2015; Wagner, 2016; Wagner-Green et al., 2017). For example, Gomes et al. (2014) conducted an empirical study on potential musical learning via the use of different technologies and multimedia to assist with instrumental (guitar and recorder) and voice pedagogy. The
researchers utilized a control group that had all lessons taught from traditional lecture with some multimedia, two experimental groups in which students were taught with multimedia materials by a professor, and a final experimental group taught via a game involving multimedia material. The authors’ found that groups using multimedia sources and games to grasp lesson material were internally motivated to learn and developed parallel skills considered in the study. This study, and the small number of similar studies in existence (see Chapter 2), demonstrate some of the promise of using such technologies.

**Statement of the Problem**

In order to establish growth in musical skills, students must engage in deliberate practice. While researchers have studied ways to teach students to practice effectively, the problem of motivating them to practice and utilizing effective practice strategies remains. Digital gamification has been found to increase student motivation and achievement in a number of studies (Archbell, 2009; Brown & Vaughan, 2009; Hamari, Kovisto, & Sarsa, 2014; Huang & Soman, 2013). After examining the literature in musical practice and digital gamification, it seems possible that an approach to the problem of student practice might be to gamify the music practice experience using digital technology. Yet there are few empirical studies that directly concern musical practice and digital gamification.

**Purpose of the Study**

The purpose of this study was to explore the potential of using digital gamification to motivate and develop middle school band students’ understanding of musical practice. The research questions are as follows:

1. Does digital gamification affect band students’ motivation to practice?
2. Can digital gamification be used to teach students how to practice effectively?
3. What are the students' and teachers' attitudes and perceptions of the digital gamification process?

Limitations of the Study

This study addressed the perceptions that middle school band students have about their practicing skills, motivation towards practice, and the use of a digitally gamified process to learn practice strategies. It also strove to determine how effective such a process could be in a middle school band class. The study was conducted in a single school, purposefully selected because of the access students have to necessary technology. This may not be the case for other schools. Additionally, while the practice unit has structure and content that could be repeated in future studies, I was not able to control every action of the participating band director, which resulted in some unintended variations from the plan.

Definition of Terms

**Boss battles:** Within video games and digitally gamified processes, a boss character is a significant computer-controlled enemy that is encountered during gameplay (Burt, 2008). This enemy is relatively stronger and larger than the gamer’s avatar and represents a particular challenge (battle) or milestone within a video game’s progression. Along with boss battles, there are smaller, less significant bosses and experiences are known as sub- or mini-bosses (Imagine Media; 1996).

**Digital badges, merits, and points:** These items are characterized to be elements of gameplay needed for the perceptions of achievement and growth through gameplay (Hamari, Kovisto, & Sarsa, 2014; Huang & Soman, 2013; Sailer et al., 2017).

**Deliberate practice:** As characterized by Ericsson, Krampe, and Tesch-Römer (1993), deliberate practice exclusively deals with activities that improve musical performance. This includes pursuing achievable goals, having consistent supervision, receiving meaningful
feedback, nurturing guided autonomy, and being provided opportunities for self-regulation and assessment (Barry & Hallam, 2002; West, 2013).

**Digital game-based learning:** Prensky (2001), Gee (2003), Aldrich (2004), and Van Eck (2006) all define digital game-based learning as purposeful instruction integrated into a game’s design through a collaboration between game designers and teachers. This collaboration in part reflects the game play experiences that student gamers experience to gain and understand content in engaging ways.

**Gamification:** Gamification is the placement of achievable merits and badges to show a sense of growth or progress within non-game contexts, while making such interactions fun and engaging (Hamari, Kovisto, & Sarsa, 2014; Huang & Soman, 2013; Huotari & Hamari, 2012; Robson et al., 2015; Sailer et al., 2017).

**Goal-based practice:** The establishing of practice goals and strategies to give students structure and help promote autonomy in learning music (Bauer, 2008; Lehmann, Sloboda, & Woody; Oare, 2007).

**Self-determination:** Ryan and Deci (2000) defines this as a focus on an individual’s social conditions and needs that assist in the development of one’s motivation and well-being.

**Self-regulation:** Self-regulation involves the monitoring of one’s behaviors, their judgement of their behavior compared to personal standards their environment, and gauging self-reaction (Bandura, 1991).
CHAPTER 2
REVIEW OF THE LITERATURE

The purpose of this study was to explore the potential of using digital gamification to motivate and develop middle school band students’ understanding of musical practice. In order to do so, an understanding of what efficient music practicing entails, what motivates students to practice, and possible implications of learning through a digitally gamified process is needed. This review of the literature will begin with a discussion of musical practice – relevant theories, concepts that promote effective practicing, and studies that deal exclusively with the practice habits of adolescent instrumental music students. Next, the different motivational theories that have been applied to music practice will be discussed. Then, digital gamification, its educational uses, and its application to music education will be addressed. Finally, the research related to goal-based practicing, including how it may align with theories of game-based learning, will be examined.

Practicing Music

The purpose of practicing music centers around individuals developing and maintaining aspects of technique, learning music, memorizing music for performance, developing interpretations, preparing for performances, and self-regulating and assessing their practice habits (Barry & Hallam, 2002; Miksza, 2015; Miksza et al., 2018; Oare, 2007, 2011; Picone, 2012). The end goal of musical practice means one should not only be able to learn a piece of music but also to develop complex mental and physical adaptations that allow for long-term learning. This ultimately leads to better performances and individuals having better experiences in music. (Drayton, 2013; Lehmann, Sloboda, & Woody, 2007). Students who have positive occurrences in music making due to purposeful practice have been noted to be involved in music making for more extended periods of their lifetime (Barry & Hallam, 2002; Lehmann,
Sloboda, & Woody, 2007). Achieving growth in musicality through quality practice is incredibly vital for adolescent musicians since structure, positive experiences, and metacognition are needed for development (Bauer, 2008; Miksza, 2006; Perez, 2011). However, the following constructs are necessary for quality practice experiences for students inside and outside the classroom.

**Deliberate Practice**

For musicians to improve, most researchers agree that they must engage in the process of deliberate practice (Ericsson et al., 1993; Ericsson & Lehmann, 1997; Lehmann, Sloboda, & Woody, 2007; Miksza, 2007). The more practical use of time is established by the teacher setting realistic, goal-directed, and structured activities for their students while providing meaningful feedback through self-monitoring or via an educator or peer (Miksza, 2007). As Ericsson, Kramp, and Tesch-Römer (1993) discovered, deliberate practicing has connections to students’ motivation and must take in their age, innate abilities, cognition, and musical experiences in consideration while planning instruction. By making sure that students have achievable goals, consistent supervision, and a sense of autonomy, instructors can ensure ways of deliberate practice among their students. (Barry & Hallam, 2002; West, 2013). These goals would should also include encouraging student to seek out models of quality playing to help and encourage and emulate appropriate musicality (Barry & Hallam, 2002).

**Practice organization**

Concerning preparedness, the duration and organization of practice time is important. Music learning, as with many other areas of academia, takes time, especially to develop musical skills (Barry & Hallam, 2002; Lehmann, Sloboda, & Woody, 2007, Miksza, 2006). Music students must prioritize a period of which they can practice the musical, cognitive, and physiological demands of the music they rehearse repetitively and consistently. However,
extended amounts of cumulative practice time may not be a good indicator of overall expertise and experience gained or the overall quality of performance (Barry & Hallam, 2002; Lehmann, Sloboda, & Woody, 2007). Barry and Hallam (2002) concluded that the organization of short practice sessions over long periods of time are not only effective but also allow for high-level thinking towards the tasks at hand, thus initiating states of metacognition.

Drayton (2013) introduced a theoretical paradigm for musicians and educators to use to improve efficiency in practice. Proposing a pretest-practice-posttest research method from prior research to establish possible gains in musical achievement and revised hypotheses, the author suggested the practice method needed only the music being practiced, extra copies of the music to assess results from, a pencil to mark-up needed information within the score, a colored pen to write in notes, a metronome to keep time and subdivide, and a recording device for concrete self-assessment. Through the sequence, Drayton (2013) emphasized using the results of the posttest assessment within the practice session for reflection of growth as well as what areas of improvement could be undertaken. If anything, the study does present the essential tools needed for an organized and productive practice session. However, this process, in addition to modeling for beginning student instrumentalists, is present within high-quality beginning band classrooms through the use of their instructional time and focus (Singletary, 2016).

Within the organization of practice time, self-assessment and regulation are also crucial to developing musicians' needs. Within advanced college and high school wind players, Miksza’s experimental study (2015) discovered that both the application of practice strategies (such as slowing down, repetition, whole-part-whole, chaining) and the use of self-regulation principles which include concentration, goal-planning, self-evaluation, and reflective activities were essential to improving musical skills. However, the recordings of pretest and posttest
assessments and analyses did identify that those using self-reflection methods improved their senses of musical nuance objectivity and practice direction and performance achievement. These results demonstrated the participants' efficient use of time as well as competency to establish achievable goals within their practice sessions. This is a skill set that has been observed to be lacking in middle school musicians. Through the concept of deliberate practice, Holmes-Davis (2015) developed a questionnaire that expanded upon Miksza’s original study to develop a measure of self-regulated practice behaviors of young instrumental students by focusing on three variables of practice habits in her tool: self-regulation (strategy selection and use), time management, and behaviors (setting goals and monitoring).

Oare (2007) studied middle school aged school musicians \( (n = 6) \), who were videotaped practicing, participated in focus groups, interviewed, and asked to discuss their practicing methods. From the analysis of the data, the researcher determined that students often know what they have gotten wrong when practicing music, yet do not have the knowledge base to thoroughly correct the correction or produce the correct instrument timbre, thus leading to issues when constructing practice goals (Oare, 2007). The researcher also recommended the use of feedback sheets for assessment and relevant feedback, providing clear performance criteria prior an assignment or test, peer assessment to help nurture motivation, practicing in front of audiences, and using a practice sheet while guiding students’ efforts to self-assess and construct their practice goals.

**Goal-based practice**

Setting attainable goals for achievement and growth are essential to quality practice among students of music. This process includes establishing practice goals and strategies (phases of practice: read through, in pieces, polish and prepare, maintenance, self-regulation, mental rehearsal, autonomy) (Bauer, 2008; Lehmann, Sloboda, & Woody; Oare, 2007). The
achievement of these set goals provided a sense of usefulness and direction for shorter practice sessions and allows students to be able to experience perceptions of progress and growth in their practicing.

Bauer (2008), Picone (2012) and Schatt (2013), have discussed the use of goal theory-based practice methods and relevant motivations to assist adolescent musicians. Bauer (2008) investigated whether adolescent band students’ levels of metacognition would be affected by an organized teaching process and an ensemble critique form for self-assessment practicing. Additionally, the researcher paid attention to any effects of students’ metacognition due to gender or age. Through the six-week project, the middle school band students were provided specific practice strategies for use during their regular band classes. The students also used a critique form gauging the factors of rhythm, intonation, phrasing, dynamics, and other musical concepts to assess performances of their efforts and discussion in class with their band director. The researcher concluded that students gradually improved in their ability to assess and critique their performance problems, increased in individual practice time, and that girls had higher metacognition skills than boys. The study also indicated that students involved in private instruction showcased significant differences concerning what and how to practice through a pre- and post-test process. This may be due to the organized, goal-based practice instruction provided to these students by their private teacher.

Schatt (2013) sought to determine what specifically motivated middle school band students to practice their instruments. Through the use of self-determination theory as the theoretical framework, the researcher-developed questionnaire, the Musical Practice Motivation Scale (MSPS), was administered to fifth grade ($n = 444$) and eighth grade ($n = 352$) band students in order to identify their levels of self-determination for practicing, the relationship
between self-determination and the number of years they have played their instrument and the amount of time they reported to practice, and how grade level, instrument choice, and private lessons affected self-determination and practicing (Schatt, 2013). In the same study, the researcher also administered the Problems in Schools Questionnaire (PIS) to teachers and parents to discover teacher autonomy and parent autonomy beliefs about students’ self-determination for practicing their instrument. From the data, significant relationships \((p < .05)\) were identified between middle school band students’ motivation to practice and the years of experience and time spent practicing and three intrinsic subscales (the desire to learn more about their instruments, accomplish a task, and have a positive stimulation of music) were rated higher than extrinsic and amotivation subscales gauged in the study (Schatt, 2013, p.101). This corresponds with the notion that positive experiences through achieving manageable goals and starting this type of practice at a younger age may affect students’ self-determination and motivation (Barry & Hallam, 2002; Lehmann, Sloboda, & Woody, 2007; Schatt, 2013).

The concept of guided practice was the premise of Picone’s (2012) study of 13 novice pianists and band students involved in recorded guided practice sessions for a year. The students participated in pre- and post-study interviews and completed a questionnaire that inquired about their motivations to pursue music (the role of music in their lives and their reasons for joining band/ taking piano lessons) and the nature of their practicing involving practice strategies, planning, self-evaluation, sense of accomplishment, persistence, and focus (p.119). After a ten-month period, the data collected were analyzed through the theoretical frameworks of self-regulation, expectancy-value theory, self-determination theory, attribution theory, and goal orientation (Picone, 2012). The researcher’s findings revealed that there was an increase in cognitive and metacognitive processes within the students' self-learning practices and suggested
practice habits should involve discovery, child-centered approaches to learning, reduce teacher involvement yet increase their scope of questioning and feedback, and have the ensemble conductor model guided practice habits. The following supports Barry & Hallam’s (2002) claim that students who used a teacher-designed approach can achieve more in practice.

Ultimately for music students to grow, they must be involved in the process of practice. Within that process, students should have experiences in deliberate practice which ensures the structure of their practice sessions, the quality of their practice, and the nature of their feedback, both from themselves as well as from their teacher. Students should also aim to have goals when practicing not only to keep from the meaningless playing on their instrument but to assist in the feeling of accomplishment and forward growth. All of which allows students to nurture self-regulatory habits and engage in metacognition; a necessity in music student development (Barry & Hallam, 2002; Bauer, 2008; Lehmann, Sloboda, & Woody, 2007).

Motivation and Practice

To further understand the musical practice of individuals, it is essential to consider the role of motivation. Researchers have studied the motivation of music students to practice and they have ranged from social reasons to personal reasons for mastery of their skills. Thorndike (1932) and Skinner (1953) proposed behaviorist theories in education which awards andpunishes actions for the sake of behavior modification. This can also be seen in music learning as teachers will give feedback and students will participate in competitions for medals and awards to encourage positive musical behaviors (Radocy & Boyle, 2012). However, West (2013) conducted a literature review of specific theoretical approaches towards motivating music students. From the review, West (2013) narrowed down these motivations to how students attribute success and failures (attribution theory, their reasons for achieving personal and skill goals (achievement goal theory), and the way students seek out satisfaction for internal needs.
(intrinsic motivation theory). For this study, the use of goal theory (which overarches achievement goal theory), self-regulation theory, and self-determination theory will be utilized to approach the nature of motivation. The three motivational theories that this study will center around achievement goal theory, self-regulation theory, and self-determination theory.

Goal theory

To develop organization for effective practice sessions and increase positive motivation to practice, an overreaching theory for setting obtainable objectives must be in place. Meece, Blumenfeld, and Hoyle (1988) referenced the creation of goal theory by theorist Dr. Edwin Locke in 1968 and his emphasis that people have goal orientations (patterns of beliefs) that lead to different learning approaches, activities, and eventually outcomes. A review of the literature concerning goal theory revealed that behavioral and emotional needs, as well as motivation and leadership, would be the driving forces of achievement and are caveats to the creation of such orientations (Hruska, 2011). Another review addressed the different goal types connected to the theory - behavioral, performance, and learning goals and how each type can be used to help set individuals set specific learning outcomes (Latham & Seijts, 2016). Specifically, behavioral goals should be based upon an individual's and an organization's desired effectiveness performance goals should be straightforward and learning goals should be set for task mastery and focused on implementing and identifying effective ways of achieving such tasks (Latham & Seijts, 2016).

Achievement goal theory

Researcher Andrew Elliot built upon the principles of goal theory within his studies and focus on the concept of achievement goals. The researcher’s collaboration with Church (1997) produced a hierarchical model of approach and avoidance achievement motivation with mastery goals that aligned with their achievement goal theory. The researchers discussed the antecedents
(the dispositions of individual competencies) and consequences (the relationship between achievement goals and achievement-relevant outcomes) of their achievement goal theory. In the study, 178 undergraduate participants were enrolled in a psychology class and attended sessions that assessed their fears of failure, competence expectancies, achievement goals, competence perceptions, and intrinsic motivation. A principle-components factor analysis was conducted on the achievement goal items to test the validity of partitioning the performance goal orientation into separate components and yielded three factors: performance-approach goal, mastery goal, and performance-avoidance goal. After the results, Elliot and Church (1997) concluded that performance-approach (more complex orientations) and performance-avoidance goals are independent of each other and have a different set of consequences. Thus, the achievement goal approach to goal mastery must be different between each concept.

Building off the research from the preceding study, Elliot and McGregor (2001) developed a 2x2 achievement goal framework consisting of mastery-approach, mastery-avoidance, performance-approach, and performance-avoidance goals to be used in three empirical studies. Through the use of researcher-developed achievement goal questionnaire and psychology class session lectures, undergraduate students were assessed three times using framework to find out if master-avoidance goals could be operationalized in a reliable manner, if the four goals in the framework represented a fair fit to the data collected, to seek out the means and intercorrelations among achievement goals, to establish antecedents to each goal, and to test the four achievement goals as predictors of different process and outcome variables (Elliot & McGregor, 2001).

In the first study using the framework, the researchers conducted an EFA of the results of the achievement goal questionnaire using principal-components extraction with varimax rotation.
which yielded the four factors (mastery-approach, mastery-avoidance, performance-approach, and performance-avoidance) with its unity solution of 81.5%. This study also produced the following means and intercorrelations among the achievement goal measures: between master-avoidance was mastery-approach \((r = .35, p < .001)\), performance-avoidance \((r = .36, p < .001)\), and performance-approach \((r = .27, p < .01)\). (Elliot & McGregor, 2001). The second study sought to replicate the initial findings and investigate possible antecedents and consequences of adopting the goals in the framework. The results of this study showcased the positive predictors of mastery-approach and performance-approach goals such as the need for achievement, work-mastery, and self-determination, and that fear of failure was a positive predictor of mastery-avoidance and performance-avoidance goals (Elliot & McGregor, 2001).

Finally, the third study addressed possible antecedence and consequences of the four achievement goal variables. The researchers focused on two outcomes for this study: the participants' exam performance attainment and the number of health center visits within the exam period (Elliot & McGregor, 2001). Much of the results of the statistical testing yielded favorably similar results in comparison to the first two studies: mastery-avoidance goals were positively associated with both mastery-approach \((r = .37, p < .001)\) and performance-avoidance \((r = .25, p < .001)\) goals and mastery-avoidance goals were unrelated to performance-approach goals \((r = .05)\) (Elliot & McGregor, 2001, p.512). The results also reported that performance-approach goals were a positive predictor of exam performance, \(F(1, 163) = 5.35, p < .05, (b = .18)\) while performance-avoidance goals were a negative predictor, \(F(1, 163) = 10.42, p < .005, (b = -.27)\) and that mastery-approach goals were a negative predictor of health center visits, \(F(1, 163) = 3.96, p < .05, (b = -.16)\), whereas performance-avoidance goals were a positive predictor, \(F(1, 163) = 3.98, p < .05, (b = .17)\) (Elliot & McGregor, 2001). In summary, Elliot and McGregor
validated the use of their framework and that competence in goal attainment and that self-regulation should be taken into consideration. There would soon be researchers that would use this framework as well as the previous Elliot and Church study (1997) to research motivational tendencies within music education (Anguiano, 2006; Midgley et al., 2001; Miksza, 2007).

Miksza (2007) developed a questionnaire based on achievement goal theory, as conceived through Elliot and McGregor’s 2X2 Achievement Goal Questionnaire (2001), that addressed four subscales: mastery-approach, mastery-avoid, performance-approach, and performance-avoid. The researcher also studied what contributed to a young music student’s motivation, behaviors, and self-efficacy by developing a self-report measure to understand how students manage their practice sessions. Miksza (2012) designed a questionnaire that assessed students’ motive, method, behavior, time management, and social influences. After a construct validity analysis, the researcher concluded that the four-factor model of self-efficacy, method/behavior, time management, and social influences were best to assess student practice habits. Thus, practice goals must cater to these factors to align with middle school band student behaviors in order to have an effect on their motivation to practice.

**Self-regulation theory**

Bandura’s self-regulation theory (1991) encompassed three principal sub-functions of self-influence: the monitoring of one’s behavior (its determinants, and its effects), judgement of that behavior compared to personal standards and environmental circumstances, and affective self-reaction. The nature of self-regulation theory also involves the nurturing of self-efficacy in that it has a strong correlation to impacting thought, affect, action, and one of the prevailing elements for the present study – motivation (Bandura, 1991). McPherson and Renwick (2001) used this theory as a lens for a longitudinal study on musical practice habits of children and would follow up with another scholar to study the theory in social cognitive perspectives.
Austin and Berg (2006) developed a 36-item Music Practice Inventory (MPI) to study the practice habits of sixth-grade band and orchestra students through the lens of motivation and self-regulation theory. The questionnaire’s sections measured practice motivation (through effort, interest, affect, parental support, and challenge seeking) as well as practice regulation (through preparation, goal-setting, use of resources, the structure of sessions, and teacher guidance). From this study, students reported their practice motivation stemmed from personal interests, their individual efforts, and their emotional responses to the music being practiced.

**Self-determination theory**

To understand the nature and possible development of self-motivation among students, one must be cognizant of the elements that need to be present in activities of such purpose. Ryan and Deci (2000) discussed the development of self-determination theory through the focus on an individual’s social conditions and factors/needs that must be met to nurture motivation, self-regulation, and well-being: competence, autonomy, and relatedness. The theory is used to investigate people’s growth tendencies and psychological needs for self-motivation (intrinsic and extrinsic) and personality development; all of which need “energy, direction, persistence, and equifinality” (Ryan & Deci, 2000, p.69). This care for the well-being and development of one’s self is incredibly important when it comes to the structure of experiences gamers and the development of music students (Anguiano, 2006; Birch, 2013; Hamari et al., 2014; Little, 2015; Picone, 2012; Sailer et al., 2017).

In essence, music educators must understand and acknowledge the motivational factors that may affect their students’ practice. Addressing the nature of goal achievement allows educators to set appropriate benchmarks and assessments to allow students to progress through the accomplishing of such goals and increase aspects of motivation, self-efficacy, and
engagement with the content. Through self-efficacy, educators should take into account the nature of student behavior within social and academic environments when planning experiences to affect their students’ motivation to practice. Furthermore, the experiences in practice need to have relevance to students for them to develop self-determination and a will to seek out more meaningful music practice sessions. This, in turn, helps to nurture better music practice and music students.

Gamification

The process of gamification is the placement of game-like elements such as achievable goals and challenges to proceed through tiered levels, and the use of merits and badges to show a sense of growth or progress within non-game contexts while making such interactions fun, engaging, and meaningful to those involved (Hamari, Kovisto, & Sarsa, 2014; Huang & Soman, 2013; Huotari & Hamari, 2012; Sailer et al., 2017). While much of these elements subscribe to extrinsic motivation afforded by game play, gamifying experiences can also influence the intrinsic motivation of participants through social engagement, interpersonal values for those experiences, and an overall enjoyable experience (Al-Allaymoun, 2015; Banfield & Wilkerson, 2014; Gee, 2007; Hamari, Kovisto, & Sarsa, 2014; Harrold, 2015; Pratskevich, 2014). Though the term is still relatively new, the concept is invaluable to the study of engagement and growth within the field of education (Boyce, 2014). By way of gamification, educators can track growth in the academics of math, science, and social sciences (Anderson, 2008; Campbell, 2016). The process of gamification has also helped develop critical thinking and social skills among students (Banfield & Wilkerson, 2014). It also makes the acquisition of knowledge fun through engagement and promoting a sense of completion - elements integral to learning (Huang & Soman, 2013). The process deals with the integration of appropriate play within instruction and gamification which should incorporate a sense of purpose, volition, attraction, the freedom of
time, a decrease of consciousness of self, improvisation, and continuing desire (Brown & Vaughan, 2009).

As reported by Huang and Soman (2013), the German automobile manufacturer Volkswagen was on to an ingenious marketing idea when they introduced their Fun Theory campaign through a simple flight of stairs. In Stockholm, Sweden, a busy city transit station stairway/escalator was modified to have a stairway made of musical keyboard steps. The effect was almost instantaneous; nearly sixty-six percent of the foot traffic of that stairway during the duration of the project tried to make music via the musical stairs. The ability to take simple tasks like moving up and down a flight of stairs and making it more engaging is the most basic essence of the process of gamification. It is gateway activities like the preceding that also parallel Sierra’s (2013) ideals of gamification being a Twenty-First-Century way for education. To make the case, the researcher presented a review of the literature and presented a synthesis between teaching pedagogy and game design principles such as mechanics, nonlinearity, challenges, evocative spaces, and the nurturing of the development of learning spaces (Sierra, 2013).

The constructs of what makes a process a game consists of many design elements that could be present to constitute having a gamified experience. According to researchers and scholars (Al-Allaymoun, 2014; Alsawaier, 2018; Banfield & Wilkerson, 2014; Bell, 2014; Birch, 2013; Boyce, 2014; Buckley & Doyle, 2017; Çeker et al., 2017; Davis & Singh, 2015; Gredler, 2003; Gulinna, 2016; Harrold, 2015; Hamari et al., 2014; Hanus & Fox, 2015; Hulsey, 2015; Jacobs, 2016; Chang & Wei, 2016; Looyestyn et al., 2017; McDaniel & Fanfarelli, 2016; Osheim, 2013; Pratskevich, 2014; Sailer et al., 2017; Sierra, 2013), games may have the evidence of the following: badges, points, leaderboards, levels, feedback, a progress bar, achievable goals and rewards, challenges, and elements of competition. Through these items,
participants involved with a game should experience sensations of flow, growth, progress, achievement, personal value, and enjoyment.

Hamari, Koivisto, and Sarsa (2014) published a literature review of empirical studies centering around the use of gamification in different settings in hopes to expose gaps in the literature. They created a conceptual framework consisting of motivational affordances leading to psychological outcomes and behavioral outcomes to assess the reviewed studies. In all, twenty-four studies were examined and ranged from educational studies to intra-organizational systems for computer companies, with education research being the most common yielding from their inquiries. The studies were compiled from conceptual papers, engineering papers, short-papers, and research-in-progress documents. From the literature, the authors concluded that there is a positive effect from the use of gamification, especially in the field of education. However, much of the success of the studies reviewed were contingent on the context that that process was employed. Those contexts included education and learning, marketing, commerce, health and exercise, data gathering, and sharing, sustainable consumption, innovation and ideation, and intra-organizational systems. While the authors did address some of the educational studies’ need to moderate effects of increased competition, task evaluation difficulties and design concerns (p. 3028), they also concluded that the studies yielded positive results concerning motivation and engagement’s effects on psychological and behavioral outcomes.

Al-Alaymoun (2014) based a study on using the prescribed elements of gamification and their effects on creativity, task performance, and task satisfaction, investigate the impact of cognitive playfulness on the proposed relationships and examine the role of flow among those variables within the subjects. Seventy-six subjects were assigned to three experimental conditions (no gamification, gamification with feedback, and gamification without feedback) and
the results that absorption and intrinsic motivation were positively connected to task satisfaction and no statistically significant differences were found among the experimental and control groups concerning flow, task satisfaction, task performance, and creativity. The study provided the rationale to engage in further studies to reexamine the researcher’s hypotheses.

There have also been studies that have discussed the connection between the process of gamification as well as the use of games to learning and education. Through the conceptual framework of deep structure (the nature of interactions between the learner and major tasks or students and the exercise), Gredler (2003) discussed the purposes and research of educational games and simulations within learning. In reference to educational games, the author indicated that they should include knowledge-based winning mechanics, meaningful content, engaging dynamics, no-consequence point system, and a lack of zero-sum exercises within their designs. Additionally, simulations should revolve around three types: social process (contingencies for different actions embedded in the scenario and role descriptions), diagnostic (contingencies based on optimal, near-optimum, and dangerous decisions that may be made), and data management (contingencies are embedded in the quantitative relations among the variables expressed in equations) (Gredler, 2003, p. 574). Through the research, Gredler examined the use of games and simulation within the military, politics, business, and medicine to bridge the gap of knowledge between content and general application and stressed that such means must be thoroughly taught how to be used effectively to increase their learning potential.

In addition to the accolades that the process of gamification brings to education and other fields, it also comes with its fair share of criticism (Bogost, 2011; Hanus & Fox, 2015; Kapp, 2012; Robertson, 2010). Hanus and Fox (2015) conducted a longitudinal study on the effects of gamification on students enrolled in a 16-week course in comparison with students within
another course without the gamification of its instruction. After measuring the classes’ motivation, social comparisons, efforts, satisfaction, learner empowerment, and academic performance, students within the gamified course displayed less motivation, satisfaction, and empowerment than the students involved in the non-gamified course. The researchers attributed this conclusion to the issue of using ineffective reward systems and badges to influence intrinsic motivation as students came to expect a reward when completing a task; if there is no reward, the student no longer has a reason to perform (Deci et al., 2001; Lepper et al., 1973; Tang & Hall, 1995).

There are also the dangers of the more present element of the gamification process known as pointsification, or gaming processes dependent solely on the reward systems of points, leaderboards, and badges. (Bogost, 2011; Kapp, 2012; Robertson, 2010). Within their survey on gamification, Seaborn and Fels (2015) discussed the criticisms of pointsification between other scholars. To Robertson (2010), point systems are considered the least essential element to the gamification process. Bogost (2011) discussed that the focus of directly procuring points for entertainment was a strategy used for big business for profit and gaming experiences can be narrowed down to that process for easier engagement. Additionally, Kapp (2012) also echoed this sentiment and believed that too much emphasis had been placed on reward systems of gamification in which takes away from the importance of engagement, storyline, visuals, and problem-solving.

**Digital Gamification in Education**

The gamification of educational content through video and computer games as well as mobile applications is still a foreign concept to many individuals as well as educators who feel that playing video games is still too leisurely of an activity to be taken seriously as a medium of learning (Blumberg, Almonte, Barkhordari, & Leno, 2014). However, scholars (Anderson, 2008;
Bethea, 2008; Dicheva et al., 2014; Domínguez et al., 2013; Gee, 2007; Mazzo, 2015; Muntean, 2011; Prensky, 2006; Whitton, 2010) have studied and written on the impact of this type of learning in education. Learning through video games has been linked to increased academic success as well as an increase in student efficacy (Archbell, 2009; Brown, 2008). In texts by Steinkuehler, Squire, and Barab (2012), and Blumberg (2014), the act of digital gamification within education was thoroughly discussed in many views and approaches. Through the collaboration of contributing researchers and scholars, the cognitive, social, academic, and curricular view and benefits of gamification through digital learning are elaborated in detail; a great deal of emphasis was based on motivation and the positive implications of the incorporation of video games in the classroom for the transfer of learning. This trend is especially evident among the learning habits of millennial students involved in gamification (Mazzo, 2015; Sierra, 2013). This also meant that elements found in gamification, such as badges, levels, and competition, would need to be evident in its digitalization process to be effective (Kriedeman, 2016).

In a mapping study by Dicheva, Dichev, Agre, and Angelova (2014), empirical research of the gamification of education was explicitly discussed. While much of the literature was limited to papers that focused on gaming elements that were in educational contexts, the mapping design of the study and categorizing of the research led to the organization of design principles (such as goals, personalization, rapid feedback, visible status, freedom of choice, freedom to fail, etc.), game mechanics (points, badges, levels, etc.), context of application, implantation, and the evaluation of the process. While the study outlined the needs for proper technical support and controlled studies presenting reliable positive or negative results of using game elements in educational contexts, it also showcased that game design should not focus on
large amounts of design and development but on factors that improved upon learners' engagement and motivation. Much of this research corresponds to the outlined constructs needed for a gamified process to happen and echoes the findings of other reviews of empirical gamification studies (Hamari, Koivisto, and Sarsa, 2014). This also ties in with a controlled study conducted by Sailer, Hense, Mayr, and Mandl (2017) where the use of game design elements like badges, leaderboards, and progress graphs/bars appealed to the psychological needs of those involved in gameplay, positively affected their sense of task completion, and increased motivation among players.

Osheim (2013) provided more evidence concerning the constructs of what digital gamification would look like in a college classroom. Through the lens of Foucault’s Concept of Hetertopian rhetorical criticism (1986), the researcher used an autoethnography to define the process with the use of the game World of Warcraft (2004) as a college course. The heterotopic principles addressed in the study included what is common in society, what serves a purpose, gathers conflicting spaces, exists in a "slice of time", fluid accessible, and functions in relation to society; all of which correlated with a gaming mechanic found within World of Warcraft gameplay (Osheim, 2013, p.47). The researcher played the game between five and seven hours while leveling up four different playable character races with various quests and class functions. A journal was also taken of the researcher’s gaming experiences, and application within a classroom with a single entry per level played for each character (Osheim, 2013).

The researcher yielded emergent fundamentals of educational gamification within gameplay: gamification is should be a low-risk experience, form is a function within the structure of gameplay, and that choice is essential during play. These findings led Osheim (2013) to recommend that educators must modify gamification processes to meet the needs of the
students through a point-system and appropriate curriculum but to also be sure to beta-test such process to ensure its effectiveness (p.90). Ackerman (2017) conducted a case study using World of Warcraft as well. After studying nine adolescent public and charter school students’ journals documenting their gameplay experiences and how they affected their self-efficacy and self-regulation, the researcher discovered that the students were using critical thinking, problem-solving, collaboration, communication, creativity, and innovation. The students’ experiences also involved three areas of learning: social cognitive theory, community, and learning support through agency, reinforcement/feedback, graphic user interface, and storytelling (Ackerman, 2017).

Gee (2007) presented the charge to researchers, educators, and gamers alike to look towards the potential of learning through video games. The author presented a solid stamp on issues that would be pertinent to address if video games were to be considered viable tools for learning. Those topics included video game violence, content, effects on the human mind, general learning through video games, differences between the aspects of pleasure and professionalism in context, the timing of video game study, concept of affinity spaces, reading and language, and other topics of concern or implications. Much of which can be parallel to Prenky’s (2006) constructs of what makes a commercial or educational video game useful and substantial through the process of the scholar's five levels of learning: how (learning how to do something through gaming), what (learning what to do), why (understanding the rules and limitations), where (learning the context of the game), and whether (learning to make value-based and moral decisions through gaming). Taking the time of this publication into consideration, many of these ideas were still very new to academia and had yet to truly be addressed.
However, Gee's (2007) narrative presents them all in hopes for future study. Brown (2008) took on learning and video games through the lens of politics, social sciences, aesthetics, storytelling, ethics, and religion. However, chapters seven, eight, and nine of the author’s text go into the application of pedagogy of video games in education and the development of student identity. Whitton (2010) explained a view of the digital gamification in education through four parts within the text: games that prompt active and engaging learning, motivation, meaningful play, and whether video games were effective learning technologies. There was also attention given to the experiences encountered in video gaming in education.

**Digital game-based learning**

Within the digital gamification of education, there are two camps to consider. While much of what was previously discussed involved the use of video games and supplementary games for recreational and educational usage in non-game contexts, there is the concept of digital game-based learning that is somewhat different. After researching the elements of what differentiates educational video games and digital game-based learning, scholars like Prensky (2001), Gee (2003), Aldrich (2004), and Van Eck (2006) concluded that digital game-based learning is contingent on the amount of purposeful instruction integrated into a game’s design and experiences. They stressed that much of that task has to involve joint efforts between game designers and educators. Çeker and Özdamh (2017) further made this case by conducting a literature review differentiating the general constructs of digital gamification from digital game-based learning and games. In their paper, gamification is described as a non-game activity with gaming principles imposed and that those involved in game-based learning often reach educational targets through gameplay. In essence, non-game environments are gamified through gamification, and that digital game-based learning exclusively uses games to teach subjects.
Baek and Whitton (2013) presented several cases studies that showcased digital-based learning and the gamification of video games with different content areas. In the particular interest of this potential study, the first section of the text dealt with the use of commercial games for student learning and the sixth section explicitly dealt with the practice of using such technologies within several classrooms. From the use of MMORPGs (massively multiplayer online role-playing) games and Nintendo’s Wii console to the analysis of game animations to support learning in math classroom settings, the action research within this text offered several views and approaches of digital game-based learning and how certain games may serve as models for future research.

Anderson (2008) researched the effects and possible implications of using educational computer and video games on student learning. Through the use of mixed-methods research, the author was able to conclude that the learning outcomes outlined in the study improved from pre to post-test for all the fifth-grade students involved in the study. The data was compiled through class observations, pre and post-tests, student field notes, and researcher-produced field notes. Anderson (2008) presents a thorough explanation of the history of video game inclusion and the possible benefits to education. The author also places special attention to gender specification in video game learning and describes methodologies used to gather information explicitly. The types of video games used and what improvements that could be implemented to expedite learning processes were addressed as well.

Classcraft

Classcraft (2013) is an online platform that can be used to create gamified learning activities that may also facilitate classroom management and student engagement. It was initially designed by former teachers to emulate fantasy games such as the tabletop board game Dungeons and Dragons and the massively multiplayer online (MMO) game World of Warcraft.
Many of the design principles of the system are presented as a learning experience for students by pairing gaming mechanics, such as gaining points and health bars, with superimposed content from the instructor and a focus on autonomy, competency, and the development of collegial relationships among students (Classcraft, 2013). This presentation is specifically done by the teacher assigning customizable avatars to students and designing quests that can range from the reinforcement of classroom management principles to specific lessons and units of instruction. As gameplay is actively applied within the instruction, the students' avatars can either gain or lose health, collect experience points, and progress through designed instructional quests via the consequences of their attempts to fulfill tasks outlined within the quests. For example, a student’s avatar may lose health should they choose to not turn in a homework assignment or gain level experience for finishing a quiz.

As of recently, there have been several studies and discussions on the use of Classcraft within different learning environments. These studies ranged from addressing classroom management (Sanchez, Young, & Jouneau-Sion, 2017, Schneider, 2016), implementation in the classroom (Papadakis & Kalogiannakis, 2017; Perdue, 2016; Schneider, 2016), and implications upon motivation (Haris & Sugito, 2015; Welbers et al., 2019). Sanchez, Young, and Jouneau-Sion (2017) spoke upon the potentials of using Classcraft not only as a means of gamification, yet also as a valid tool for strengthening classroom management. Through a literature review and questionnaires distributed to teachers in France and Quebec, the data gathered conceptualized the experience from gameplay as a “ludicization”; the students would capitalize more on the ‘play’ experience of the platform rather than the game elements and respond more to management policies because of it (Sanchez, Young, & Jouneau-Sion, 2017, p.497; Welbers et al., 2019). The proposed experiences in the preceding study are also echoed in a Podcast (Young & Moore,
2018) and Classcraft discussion board where music educator Sam Schneider (2016) spoke upon using the online platform as a management tool for his band, general music, and music technology classes.

Schneider (2016) also exclaimed the potentials of learning through Classcraft on the platform’s online discussion board posts. He as well as other music educators addressed how they supplemented instruction in their music classes via online quests, group activities, and online assessments. Some of these same elements were found by Papadakis and Kalogiannakis (2017) through a pilot teaching intervention. Through learning via Classcraft, the researchers noticed that while the academic performance of the participants did not increase by much, the engagement of content through the platform had improved. Finally, Perdue (2016) acknowledged that Classcraft was an effective tool in teaching mathematics via digital gamification.

Concerning motivation, Haris and Sugito’s (2015) studied the factors that affected the acceptance of E-Learning of students from the Tarumanagara University’s Information Technology department through the Classcraft online platform. Through the use of case studies and the theoretical framework of the Unified Theory of Acceptance and Use of Technology (UTAUT), the researchers prompted implemented the use of the gaming system via six variables: E-Learning motivation, social influence, content quality, facilitating condition, behavioral intention, and actual usage. From the analyses, Haris and Sugtio (2015) discovered that the significant factors found from using Classcraft for instruction were motivation and behavioral intention yet social influence, facilitating conditions, and content qualities were not significant factors. From the study, the researchers determined that user motivation for using Classcraft was the most significant factor for use in that setting and that motivation must be maintained through engaging and active learning experiences. The preceding conclusion was strengthened by
Welbers, Konijn, Burgers, de Vaate, Eden, and Brugman (2019) through their field study of Dutch university students ($N=101$) and their use of Classcraft to gain feedback and prevent binging experiences. The researchers concluded that generic feedback from Classcraft was more effective than specific, tailored feedback from instructors, thus impacting motivation and encouraging play through a gamified process (Welbers et al., 2019).

**Perspectives on digital gamification in learning**

There has also been research that addressed the potential of learning between video games and their players. (Archbell, 2009; Bethea, 2008; Haris & Sugito, 2015; Hoffman, 2009) These studies concluded that though the gamers were not always fully aware of the learning that was happening in play, they did express an interest in the integration of video gaming into the formal school curricula. They also addressed different methods proving the effectiveness of using video games to learn via the way of the individual, through groups, on secondary and collegiate levels, and learning theories. Additionally, these works presented detailed outlooks on the amount of relevant, educational information that is presented within video and computer games as well as the different forms that they are presented in as well as provided several examples of general research to consult to promote the widespread inclusion of video games in education. One may conclude that the importance of having the gamers’ insights was probably the most informative aspect of the study, as this is the link to understanding what could keep students, especially boys, engaged academically and for entertainment purposes for long periods of time (Archbell, 2009; Haris & Sugito, 2015; Hoffman, 2009).

The research has discussed the effects and possible implications of using educational computer and video games on student learning. Studies have concluded that the learning outcomes set forth in within studies improved from a pre-to-post test for students involved and placed special attention to gender specification in video game learning and describes
methodologies used to gather information explicitly. These studies also revolved around the gauging of potential for using educational gaming technology among students in teacher preparation programs and displayed that the students were more inclined to use educational gaming technology in their classrooms. This was due to the significant correlations between the age of the students’ first use of technology, attitudes toward teaching with the internet, embracing new ideas, and the perceptions of peers to use ideas. The significance of these studies is that they displayed the perceptions of potential new teachers and students when it comes to educational gaming or the general inclusion of advancing educational technology — additionally, the types of video games used and what improvements that could be implemented to expedite learning processes was significant as well (Anderson, 2008; Beck & Whitton, 2013; Bethea, 2008).

Bethea's study (2008) revolved around the gauging of the potential for using educational gaming technology within students in a teacher preparation program at a Historically Black College or University (HBCU). The author conducted a quantitative study using an online or written questionnaire to gather data from the participants. The researched displayed that the students were more inclined to use educational gaming technology in their classrooms. This was due to the significant correlations between the age of the students’ first use of technology, attitudes toward teaching with the internet, embracing new ideas, and the perceptions of peers to use ideas. The study is significant because it displays the perceptions of potential new teachers in the field when it comes to educational gaming or the general inclusion of advancing educational technology. It also corresponds with the perceptions of veteran teachers and how gamification could be implemented in high school curriculums. McFarland (2017) also conducted a variation of this study this by interviewing ten teachers using gamification practices to teach content and
discovered that there is evidence of motivational impact from their experiences and prompted for more research in implementation as well as for school leadership training.

Hoffmann (2009) briefly discusses the implication of learning through video games by the study of the dynamics between the players and their games. To do that, the author shares several examples of research that address different methods proving the effectiveness of using video games to learn via the way of the individual, through groups, on secondary and collegiate levels, and learning theories. While brief, the article provides several examples of general research to consult to promote the general inclusion of video games in education. The methods presented in Hoffmann’s study may also align with how using gamification can deter the fear of failure through effective implementation. Kallevig (2015) studied this perception with the use of a survey based in descriptive research methodology that collected the thoughts on students within formal education and higher education on perceived failure in games and in learning and how failure in games could be used to promote learning. After the analyses of the pilot study in the summer of 2014 (n = 39) and the formal study in the fall of 2014 (n = 124), the researcher learned that participants learned from failure about in the same amount as those who learned from success, yet failure was seen as more of a positive learning experience through gaming (Kallevig, 2015).

**Digital games and game-based learning within music education**

Video games are still very new to the realm of education, yet the concept of gamification has been well established within video game mechanics (Richardson & Kim, 2011). Music educators are slowly making the ties and connections between the elements of music (rhythm, melody, harmony, form, etc.) being emphasized or even taught through gameplay, and can assess these elements through in-game achievements and progress (Criswell, 2009, d’Escrivián &

In their article, d’Escrivián and Collins (2001) presented a viewpoint on musical and visual elements within music video and computer games. The article specifically addresses the relationship between music and games via the acquisition of in-game rewards and goals through hand-eye coordination in rhythm video games. However, it touches upon the educational implications of this video game genre as well as games that use music as a developmental tool for gameplay. Finally, the authors discuss the correlation between motor skills and musical concepts developed when playing rhythm video games through audible and visual aesthetics and how they could possibly be used in the classroom. These insights paralleled with Criswell’s (2009) and Feola’s (2010) thoughts and findings on the possible educational benefits and implication of popular music video games, such as Guitar Hero, Rock Band, and Wii Music. In the researcher’s discussion, music video games that were not educationally grounded, yet possessed substantial concepts of music within gameplay were supplemental to instruction and possible curriculum development. Specifically, Wii Music’s elements of collaborative music making, attention to correct rhythms, and its potential for pitch detection and training were highlighted in the researchers’ findings.

Kassner (2006) presented an in-depth review of the educational game Music Ace Maestro from Harmonic Vision in this article. The game is used in a classroom setting and its functionalities, like the use of microphones and MIDI keyboards, are highlighted to showcase the musical concepts the software introduces and teaches. Additionally, the game is deemed to have been created using the Pestalozzi learning theory, as certain concepts are learned through sound before any visual representation is given. These findings correspond to some degree to Kersten
(2006) discussion on ways to incorporate technology into music education for children from newborn to age eight. The literature in the article went through the realms of psychomotor, visual, and audible music training in early childhood development and continued through the possible devices (computers, electronic keyboards, drum pads, etc.) used to trigger the senses and cause movement to music, timbre recognition, singing and playing, and personal actualization of music growth. The article also stressed the involvement of parents and guardians when using music technology and suggests the creation of musical spaces within a home. This allows a dedicated space for musical growth for young children to flourish. This article significant because it goes into careful detail about what musical technology for infant-age children should model and provides lesson plans for educators to model suggested practices. However, the studies concluded that while different games and software are relatively effective at what they are developed to do, they do not replace the interactions, corrections, and redirections with a real teacher.

Criswell (2009) touched upon the possible educational benefits and implication of popular music video games at the time. While the author did address some video and computer games software that was deliberately created to teach musical elements and concepts, Criswell also discussed music video games that were not educationally grounded yet possessed substantial concepts of music within gameplay. Those titles include Guitar Hero, Rock Band, and Wii Music. While the researcher implored that music educators should still strive to use these games as supplemental resources in the reading, this article opens the door to having mainstream music video games possibly being incorporated into music education curriculum. This sentiment is additionally supported by Havre, Väkevä, Christophersen, and Haugland’s (2018) case study of student and teacher (n=16) experiences of playing Rocksmith (2011, 2013), an instructional
guitar video game for over a year and based their findings within play theory, game studies and Mishra and Koehler’s Technological Pedagogical Content Knowledge (TPACK) Model. Through the data, four positions of how the participants related to gameplay emerged: the musician, the teacher, the technician, and the gamer (Harve et al., 2018). The experiences for both the musician and teacher positions saw promise for developing basic musical skills before formal training and made way for possible for motivation to improve skills to emerge. Furthermore, the technician and gamer personalities were interested in the possible improvements in the gameplay by way of the development of upcoming versions and the construction of specific game design (Harve et al., 2018).

The purpose of Richardson and Kim’s (2011) study was to conduct pilot research on how music skills, such as rhythm and melody detection, were impacted and possibly improved upon by playing interactive video games. The study involved first-year university students that were gamers and non-gamers, who routinely played rhythm video games in the likes of a regular rehearsal for a nine-week period. Through the use of quantitative pre-and post-tests as well as qualitative survey responses, the study concluded that there were some learning advantages gained by those who played the rhythm video games. The authors credited the results more to visual stimuli presented within gaming alongside the rhythmic elements of these games and offered suggestions on how to refine the study of tracking the effectiveness of interactive rhythm video games for further research.

Gower and McDowall (2012) tried to dispel the argument of interactive music video games not having educational implications and promoted their usefulness in learning environments through research. In their study, students and music teachers from different metropolitan schools were given semi-structured interviews that addressed the experiences and
individuals’ thoughts on the possibilities that music video games can increase musical skills and concepts. The results were in favor of the inclusion of these types of games improving some musical skills and keeping a high interest in children. Additionally, the teachers in the study believed that with further research and development of this type of game by way of composing and creation, they do have a place in the music education curriculum. The researchers presented a strong case for the inclusion of interactive video games through the lens of the constructivist theories of learning. The concluding ideas and implications of meaningful learning, critical thinking, and informed choice are focused on the individualistic aspect of student growth through these games. Finally, the article presented ways on how the interest of incorporating interactive music video games could be reintroduced.

Hungate (2015) presented an exhaustive list of technologies, applications, and software to promote the growth of high school student's musicianship best. The general purpose of the study was to propose technologies that music educators could use within their performance classes to help strengthen individual musicality. The researcher used the skill sets of developing time, sight-reading, general music theory, improvisation, and composition to guide the selection and assessment of these technologies. These music applications even included the incorporation of video game-like music applications such as Got Rhythm (2015), Rhythm Teacher (2016) and ChordFind (2016). However, the researcher did not explicitly address the use of music video games within the findings or whether the technologies covered were already being used by music educators on a large scale.

**Motivation through digital gamification**

Amidst the knowledge of digital gamification and practice, video and computer games can possibly be viewed as more of a supplemental addition to music education curriculum. They also have the possibility to become a major and engaging main attribute to it (Clements-Cortés,
In order to improve student music learning, practice through digital-based game learning must meet at the major construct present within the research: motivation. To address the nature of motivation within the digital gamification of music learning, one must discuss the beliefs that drives music students.

McAlister (2013) discussed how the gaining of experience points and goal setting during video game play corresponds with the aspects of achievement when learning one's instrument. Therefore, software that is created to reward musical learning and achievement quantifies their growth and provides clear and immediate feedback would be extremely beneficial to the development of the musician. Along with elements of collaboration between student, teacher, and parents, the author believed motivation can be expedited with the use of more video games of this type. Using a phenomenological approach to study gameplay experiences of adolescent students with Guitar Hero and Rock Band, Little (2015) sought out to answer the following research questions:

1. What do adolescents experience when playing music games?
2. How does playing Guitar Hero and Rock Band impact an adolescent’s musicianship?
3. What educational opportunities do engagement with these games provide?

Using Elliot’s (1995) theory of musicianship and Bourdieu’s (1986) theory of capital, the researcher conducted semi-structured interviews and observations with participant gamers. While the data from gameplay showed that it was highly ineffective in developing the participants’ musicianship, it did allow the prior musicianship and experiences of participants to be showcased within gameplay (Little, 2015). Additionally, the social experiences provided in such gameplay with Guitar Hero, Rock Band, and other like games via role-play and having a medium to demonstrate their musicianship and skills that were often taught in music classrooms are also
positive implications towards music learning, motivation, and achievement (Banfield & Wilkerson, 2014; Creswell, 2009; Gredler, 2003; Harve et al., 2018; Little, 2015; Mazzo, 2015; Sierra, 2013).

Mercer (2009) briefly addresses video games that have been used to some degree in music classrooms. The article explains the uses of Rock Band, Dance Dance Revolution, Wii Music, and Sing It and the elements of music instruction that are either taught or supplemented within gameplay. The author provides a solid introduction to possible interactive music video games for music educators to enhance their instruction. In addition to those findings, Paney’s (2015) study gauges how pitch-matching skills of undergraduate students are affected by the pitch-matching elements of interactive video games. The games discussed in the study include Rock Band and Karaoke Revolution. Motivation is a crucial element to the study as non-musician undergraduates are pre-tested for pitch-matching abilities before gameplay and assessed thereafter. The subjects are encouraged to obtain a high score, which in turns increases pitch accuracy. The results proved positive after ten minutes of gameplay, and the author suggests that these games could assist in the development of pitch-matching skills in musical and non-musical students.

The premise of Reyher’s (2014) article deals with the applications of the interactive video game Rhythm Heaven Fever in different aspects of music instruction. Along with making the general case that interactive games like the preceding title are beneficial as supplements to the standard music curricula, the authors speak to the game’s focus on rhythmic gameplay mechanics and how they can possibly enhance rhythm detection, motor skills, and musical skills that include the perception of down/up beats and syncopation. Additionally, the article addresses how the immediate feedback received in gameplay, as well as its rating system for rhythmic
accuracy when one does well on a mini-game, would lead to increased motivation, engagement, and could lead to classroom collaboration, assessment, and achievement.

For music education, the gamification of instruction through digital games and processes may be one of the new ways to teach musical skills and content. The literature has indicated that the process of gamification has been a new staple within society to engage and encapsulate the consumer through its elements of play and competition. Slowly, educators have subscribed to the implications of using gamification to supplement and introduce instructional content. These proposed benefits would include increased engagement with the academic content being taught, chances for relevant group learning interaction and competition, self-discovery and regulation, and feelings of achievement through the accomplishment of goals and events found within gameplay. Even more slowly has there been a push to accept the process of gamification through use of digital games, applications, and methods to further embellish learning experiences for students. While there have been many music video games that incorporate the assessment of musical skills within gameplay design and applications and online platforms are being developed to help create more relevant music learning experiences, the literature to support these claims is still sparse.

**Summary of the Chapter**

For students to be engaged in active music practice, there must be experiences that affect the way they practice as well as why they practice. Engaging students in deliberate practice habits and guiding their practice sessions with achievable goals, while also providing them opportunities for self-regulation and meaningful feedback, will allow for musical growth. Additionally, basing these activities in motivational research, such as the use of achievement goals, regulation, determination, and some behavioral practices, will speak to the reasons of why
students practice in the first place and hopefully encourage them to use better practicing processes.

The gamification of music learning principles could also have a direct impact on the motivation of music students. It has been proven to be a process that is used across different professional fields and has found a home within the field of education. Teachers and game designers are creating educational games and digital gaming learning processes to hopefully bridge the gap between students and educational content through relevant gameplay experiences. Within music education, the concepts of rhythm, pitch, melody, and harmony have been shown that they could be taught or effectively supplemented by the use of such music video games or experiences within a music classroom. More specifically, a digital game-based platform such as Classcraft can integrate the teaching of goal-based practice habits, self-assessment, and self-regulation through gameplay.

Nevertheless, there is still much to be done in the development of video and computer gaming software to teach musical concepts as thoroughly and effectively as the classroom music teacher. However, should music educators promote and advocate the development of software specifically geared to teaching such concepts and make sure they are aligned with appropriate curriculum aims and still engaging to the students in focus, there could be significant gains in incorporating this type of technology into mainstream music education. However, more scientific research would help promote the integration of such technologies into the music classroom.
CHAPTER 3
METHODOLOGY

The purpose of this study was to explore the potential of using digital gamification to motivate and develop middle school band students’ understanding of musical practice.

Research Questions

The study addressed the following questions:

1. Does digital gamification affect band student's motivation to practice?
2. Can digital gamification be used to teach students practice strategies effectively?
3. What are the students' and teachers' attitudes and perceptions of the digital gamification process?

Research Approach and Theoretical Framework

Embedded Mixed-Methods

According to Creswell (2012), “mixed-methods research is an approach to inquiry involving collecting both quantitative and qualitative data, integrating the two forms of data, and using distinct designs that may involve philosophical assumptions and theoretical frameworks” (p.4). Since the 1980’s, the mixed-methods research approach has served researchers in the fields of evaluation, education, management, sociology, and healthcare and has undergone several periods of development to promote its worth in the field of research (Creswell, 2012). This design seeks to combine and build upon the strengths, and minimize the weaknesses, of qualitative data that tends to be non-predetermined, open-ended responses, and quantitative data that include closed-ended items found on questionnaires (Creswell, 2012). Furthermore, a mixed-methods research design may allow integration of the data to provide greater confidence in validity and reliability, truthfulness, and the efficacy of measurement tools (Tahsakkori & Teeddlie, 2010).
A case study research design is used to describe, analyze, and interpret a culture’s shared patterns of behavior, beliefs, contexts, and language over time (Creswell, 2014; Creswell & Poth, 2017). Case studies are also defined by Mertler (2002) as detailed examinations of a single setting, subject, or a particular event in time. One would conduct such a study to garner an understanding of a larger issue through the shared values, beliefs, and language of the group studied through detailed day-by-day events (Creswell, 2014). Gillham (2000) and Stake (1995) believed that case studies are extremely potent and may have more of an impact than other forms of research reporting due to the complexity of data gathered from even a single case. Some of the shared characteristics of this type of research design include gathering data on cultural themes and culture-sharing groups, identifying shared patterns, conducting fieldwork, providing a description of themes, interpreting the context or setting of the study, and addressing researcher reflexivity. Yin (2017) quantified the needed elements in case study design to six sources: documents, archival records, interviews, direct observations, participant-observation, and physical artifacts. In this study, the following characteristics of this qualitative research design (Creswell, 2012; Yin, 2017) were prioritized:

1. Data will be collected in a natural setting where participants experience the issue under study.

2. The researcher will be a key instrument and responsible for collecting the data through a semi-structured interview, focus groups, and pre- and post-project questionnaires.

3. Multiple forms of data will be gathered, including interviews, documents, and audio/video information; this data will be analyzed to form categories and themes.

4. The focus will be on learning the meaning that the participants have about the problem.

5. A holistic, encompassing picture of the problem under study will be developed through reporting multiple perspectives and emergent factors in the situation.

This study utilized a convergent parallel mixed-methods approach within an overall case study design, collecting both quantitative and qualitative data, analyzing them separately, and
comparing the results to see if the findings confirm or disconfirm each other. The perceived assumption of the convergent parallel mixed-methods approach is that the two different types of data come from different sources of information yet should produce similar results (Creswell, 2012). According to Creswell and Plano-Clark (2007), validity and reliability in mixed method designs can involve methods steeped in both qualitative and quantitative research, but the overall design has to be assessed and the potential threats to its validity are taken into consideration. More specifically, the convergent design should strive to establish construct validity and triangulation of data within the study being pursued.

The use of a case study allowed me to focus on a particular program, event, and activity involving individuals, having them describe their experiences directly. Additionally, the collection of quantitative and qualitative data within the case study extended the range of evidence on the study’s topic (Gillham, 2000). Creswell (2014) explained that case studies are in-depth explorations of bounded systems (separated out of research in terms of time, place, or some physical boundaries) based on extensive data collection. Specifically, this study was an instrumental case study as it focuses on a case to examine a specific theoretical issue or concern and will depend on the method of triangulation in order to gain a full understanding of the data (Creswell, 2012; Hancock & Algozzine, 2016; Stake, 1995). In order to obtain the most relevant data in an accessible time frame, this study employed the use of embedded mixed-methods.

As this study aimed to examine the perceptions of a teacher and her students who used digitally gamified instruction as part of a standard, traditional musical activity, the nature of this research fell into the characteristics of the constructivist worldview. This brought the view of the participants to the forefront as I sought to understand their world and the meaning of their experiences (Creswell, 2012). In this study, the band director and her students experienced
instruction on music practicing habits, taught through a digitally gamified experience, and constructed personal insights and perceptions that became the study’s data. In order to collect information from the participating band director and students, I used open-ended questions and engagement through interviews for quality data and meaning. The overall assumptions gained from such research were the constructed meanings from the participants as they engaged in the world they are interpreting, made sense of it through social and historical contexts, and among one another within a community (Creswell, 2012).

**Participants, School, and Intervention**

The participants, a middle school band director and her class of students at a K-12 laboratory school located at a major southeastern university, were purposefully selected. The selected site has served its community not only as a development school for educational research for its hosting university but has also operated as a public neighborhood school where students are admitted through a lottery process. The school serves a school population that is 52% minority, 50% of its students’ families are below its state’s median income, and students with disabilities represent 12% of the population. The students and faculty are also able to take advantage of the school’s one-to-one policy as each student in 4th and 5th grade is issued a Chromebook to use on campus and students from 6th grade to 12th can use their Chromebooks at school and at home. The band program at the school hosts a beginning 6th-grade band, 7th-grade band, and 8th-grade band for its middle school division. It also supports a concert, a symphonic, and a marching band for its high school division. This site was chosen due to the suitability of the teacher and the student participants, the accessibility of the location to conduct research, and the band director’s and students’ willingness to participate.

After speaking with the band director concerning a middle school band class with at least 30 students to draw from for the study, it was highly recommended that I conduct my study with
her 7th-grade band class that met every other end of the instructional day due to block scheduling. This suggestion was in part due to the class’s willingness to participate and the band director’s confidence in the engagement by the students and because they would have their Chromebooks to use. This led to a possible participant size of 21. With assistance from the band director, I introduced the nature of the study to the class and informally inquired on the class’s interests to participate. A fair majority of the class seemed initially interested in the project, albeit that some of the students felt like it was another thing to do at the end of the school year. Additionally, an informal inquiry of the potential participants indicated that many of the students were already engaged with the Classcraft platform within their classes as a classroom management tool. This situation may have affected their engagement and participation throughout the unit.

At the end of the introduction, the students were given their student assent forms to sign as well as the parent/guardian consent forms to take home to be signed and turned in. The students signed their assent forms in class, were provided a week to turn in their parental consent forms and reminded the day before the official start of the project. Due to the effects of attrition due to students forgetting to submit their consent forms in a timely fashion, the official number of participants for the project turned out to be 16. All 21 students were allowed to participate in the Classcraft project, yet only the data of the students who turned in both their assent and parental consent forms were used for this reporting ($n = 16$).

Please note that the 16 students fully participating did not make up the full band and that all students did have the chance to engage in the Classcraft project. However, I sought only to use data from students that turned in both their consent and assent forms. Of those participating, 56% of the students were female ($n = 9$) and 44% were male ($n = 7$). 56% of the participating
students reported as being White \((n = 7)\), with 31\% being Hispanic \((n = 5)\), 19\% being Black \((n = 3)\), and one student (1\%) reported as being mixed. The preceding student also identified as being Black, White, American Indian, and Mixed within the questionnaire. In order to keep the clarity of the gathered data, I labeled the student as one with mixed racial backgrounds. The ages ranged between 12 and 13 years of age and due to birthdays within the project’s timeline, the number of students who were 13 rose from 12 to 14 at the end.

While this report does not provide the full make-up of the band class’s instrumentation, the participating students created a fairly balanced instrumentation consisting of instruments found within beginning bands (see Table 3-1). 69\% of the participating students \((n = 11)\) stated that they did not play a secondary band instrument in school, while 31\% \((n = 5)\) said they did. Finally, 81\% of the participating students \((n = 13)\) reported starting band in 6th grade while 19\% \((n = 3)\) started this present year in 7th grade.

Table 3-1. Participating band class makeup.

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flutes</td>
<td>2</td>
</tr>
<tr>
<td>Clarinet</td>
<td>1</td>
</tr>
<tr>
<td>Alto Saxophone</td>
<td>1</td>
</tr>
<tr>
<td>Tenor Saxophone</td>
<td>1</td>
</tr>
<tr>
<td>Trumpet</td>
<td>2</td>
</tr>
<tr>
<td>French Horn</td>
<td>2</td>
</tr>
<tr>
<td>Trombone</td>
<td>2</td>
</tr>
<tr>
<td>Baritone Horn/ Euphonium</td>
<td>1</td>
</tr>
<tr>
<td>Tuba</td>
<td>2</td>
</tr>
<tr>
<td>Percussion</td>
<td>2</td>
</tr>
<tr>
<td>Those who played secondary band instruments</td>
<td>5 – yes</td>
</tr>
<tr>
<td>Starting grade in band</td>
<td>13- 6th Grade</td>
</tr>
</tbody>
</table>

**Instrumentation**

**The Musical Practice and Digital Gamification Questionnaire.** The 53-item Musical Practice and Digital Gamification Questionnaire (MPDGQ) (see Appendix G) was one of the
tools used for quantitative data collection in this case study. The questionnaire was constructed by examining and adapting preexisting questionnaires (see Appendix F) used to measure motivation, learning habits, understanding of musical practice, and student interests and familiarity with video games and game-based learning technologies (Adams, 2017; Kolthammer, 2009; Schatt, 2013; Wood, 2011). The MPDGQ was made available in a digital format via the Qualtrics web-based survey tool. I administered the questionnaire before and after participants engaged in the digital gamification period of the study.

Each student participant was provided a random number to use for their questionnaires in order to identify and match respondents’ pre- and post-questionnaire data, while also helping to maintain anonymity. I also maintained a spreadsheet of student names and identification numbers which was separate from the questionnaire data.

Demographics. Section I of the questionnaire consisted of 11 dichotomous and short answer items to collect basic demographic information including age, gender, and race. Following those items, the student participants were asked when they started to play their instruments, how many days a week they practice at home, and how many minutes they commit to practicing during a typical practice session. They were also asked whether they play other instruments and if they have taken private lessons either in the past or currently.

Motivation. Section II consisted of items that explored students’ motivation toward practicing. For the present study, I modified 12 questionnaire items from a study grounded in self-determination theory that examined middle school band students’ motivation to practice (Schatt, 2013). To collect data on motivation to practice, participants responded to each questionnaire item on a Likert-type scale ranging from ‘1-completely disagree’ to ‘5-completely agree.’ Specifically, the participants’ (a) intrinsic motivation-to know, (b) intrinsic motivation-to
accomplish, (c) intrinsic motivation-to experience stimulation, (d) extrinsic motivation-identified, (e) extrinsic motivation-external regulation, (f) extrinsic motivation-introjected, and (g) amotivation, all of which deal with self-determination, were gauged in the questionnaire (Barry & Hallam, 2002; Lehmann, Sloboda, & Woody, 2007).

**Practice.** Section III assessed the student participants’ knowledge of practice strategies and habits, adapting items from the research of Kolthammer (2009). After a series of pilot studies, the Kolthammer conducted a quasi-experimental study using questionnaire administered prior to and following tutorials on musical practice delivered during a band rehearsal. In the present study, 14 items in Sections III, IV, and V of Kolthammer’s (2009) questionnaire, specifically those addressing what students understood about practice and use of practice strategies (such as breaking down sections, repetition, clapping/counting, mental rehearsal, and goal setting) will be used.

**Perceptions of digital gamification.** To address perceptions of video game use during learning activities, 14 modified items from previous research by Adams (2017) and Wood (2011) were employed in Section IV. While investigating video games as instructional tools and the possible cognitive outcomes from them, Wood (2011) used an interview protocol and post-test survey items scored by Nelson and Drake’s rubric (1997) that analyzed the reflective writings of participants. Adams (2017) researched subscales of learning and motivation in digital games through use of a questionnaire that gauged students’ interests, beliefs, goals, needs, and knowledge; all of which relate to student-centered learning and self-determination theory. The researcher conducted a pilot study ($N = 64$) to test the questionnaire’s inter-item reliability, variability between answer choices, and time spent taking the survey. The scores for Cronbach’s alphas, means, and standard deviations were calculated for each of the preceding subscales’
acceptability and deception among the respondents \(a = .69\). From the results of the pilot study, each of the subscales were revised for the main experiment.

**Digital Gamification Platform**

Within the program's website, there has been evidence of the use of the Classcraft web platform with different music classroom settings and activities (Schneider, 2016). Many of the functions of Classcraft discussed in the teacher forums appeared to be related to classroom management and incentives around behavior modification, such as giving rewards or consequences when a student is on time or late for rehearsal. However, some teachers have also addressed Classcraft’s potential for teambuilding (placing instrument sections and voices into groups), or supplementing curriculum with listening assignments and having students perform scales and patterns for extra power-ups for their avatars. Young and Moore (2018) interviewed one of the major contributors to the forums, music teacher and Classcraft user Sam Schneider, who went from using Classcraft solely as a management tool for his middle school general music class to integrating it into the design of both his general music and music technology classes. Schneider achieved task through developing self-paced units within the platform, creating random events that affect the individuals’ and teams’ avatars and creating engaging assessments through the boss battle tool.

Some of the corresponding activities used with Classcraft in this study included completing tutorials, answering questions about learned practice strategies and how they can be applied, and turning in practice charts (Classcraft, 2013). Although not explicitly explained, Classcraft’s design mechanics can make way for the designing of quizzes on taught content and peer-assessment experiences among students. While the standard free version of the software allows the teacher to give rewards and consequences manually on the computer or mobile applications, the premium subscription allows for customization of several options, including the
ability to design specific quests and create quests centralized around class assessments. For this study, I purchased a premium subscription to assess the full potential of Classcraft in a band class setting.

Before data collection, the participating band director was given a week to explore Classcraft and we consulted on how best to introduce and use it with her students at the end of the academic year. Band student engagement through Classcraft centered around research-based principles of deliberate musical practice. According to researchers and scholars (Barry & Hallam, 2002; Lehmann, Sloboda, & Woody, 2007; Miksza, 2006; Schatt, 2013), components of deliberate practice include the organization of practice time, short lengths of practice, establishing achievable goals, and establishing student autonomy. To achieve these factors, the use of a goal-based practice chart (Bauer, 2016) was used to assign short and accessible goals within student’s daily practice session and will be paired with subsequent tasks within a practice habits-based quest unit in Classcraft (see Appendix F). These goals included the practice of assigned concert music, rehearsal points in practiced music, and studies through the completion of practice strategies that consist of students marking parts, slowing segments down, chunking of sections into smaller parts and repeating them for accuracy, thinking and singing parts, and counting and clapping the music. (Holmes-Davis, 2015; Miksza, 2007; Kolthammer, 2009; Schatt, 2013).

**Design.** The researcher developed a deliberate practice quest called *Elysia Practoria* within Classcraft. Over a period of five weeks, student participants logged into their assigned Classcraft accounts and completed the self-paced practice quest and learn the designated practice strategy of the week. The quests and strategies were as follows:

1. Welcome to Elysia!; The Valley of the Forgetful (Marking up the music) (Austin & Berg, 2006, Drayton, 2013; Kolthammer, 2009; Schatt, 2013)
2. Largos: The Land of Déjà vu (Slowing down the music) (Kolthammer, 2009; Miksza, 2015; Schatt, 2013)

3. The Old Castle…Excelsior!: The Paladins’ Choice (Chunking music into smaller parts and student-selected practice goal setting) (Holmes-Davis, 2015; Kolthammer, 2009; Miksza, 2015; Schatt, 2013)

4. Into the Quartz Caverns!: The Rune Rubric (Thinking and singing out music and practice quality) (Kolthammer, 2009; Schatt, 2013)

5. Ambrosia: The Final Fight (Clapping and counting out the music) (Hallam, 2001; Kolthammer, 2009; Miksza, 2007)

Before the students started on their quests, they were able to choose one of the three avatar class types found within Classcraft and that emulate character designs similar to games like World of Warcraft. Each class type starts off with a set number of Health Points (HP – the amount of sustainable health), Action Points (AP – units that allow players to perform special powers), Gold Pieces (GP – units that allow players to buy accessories to customize their avatars) and a player-selected base power which either affects in-game actions or allow for real-time classroom experiences such as eating in class or getting extra points on an assignment. The Warrior class has more HP but does not have as much AP, the Mage class is weaker but has more AP to perform their powers, and the Healer class is a balance of the two. The ability to customize avatar designs and powers allowed student participants to experience a sense of ownership and creativity through gameplay. Additionally, the grouping of the three classes provided a more compelling gaming experience as players took into account each other’s strengths and weaknesses to effectively progress through the week’s quest.

As the student participants progressed through the practice quests, they built up Experience Points (XP) in order to level up to provide their avatars with new powers and customizable effects. The student participants experienced this in a number of ways. By progressing through the quests, the participants’ avatars gained 5 XP and 10 GP for each quest.
A participant was also awarded XP (5-20) as well as GP (5-25) through the successful submission of their goal-based practice chart. Additionally, the successful completion of a boss battle awarded a participant’s avatar with XP and GP. However, the participants also found themselves gaining XP but losing HP (10-20) due to a poor practice chart, no turning in a practice chart, a failed boss battle, or through a randomized event (The Riders of Vay) called upon by the band director. In order to keep in-game experiences relevant to the nature of the project, pacing of the unit, and student participant interest, I adjusted the preset values of HP, XP, AP, GP, avatar powers, and in-game consequences.

To be considered fully engaged in gameplay, student participants were to first progress through the weekly self-directed practice quests, learn, and then use each week’s featured practice strategy with the tasks outlined on each week’s goal-based practice chart. Then, they were directed to report their practice progress and use of the strategies on their practice charts and submit them to me or the band director at the end of the week. I would then log on to Classcraft and use the chart submissions to assign the appropriate awards and consequences to each participating students’ in-game avatar. In turn, the students would use their rewards (such as GP – gold pieces) to further customize their avatars by purchasing new costumes, magic powers, and other in-game elements. In contrast, they could also use their gained AP – action points to use an in-game magic spell to assist a classmate’s avatar if they sustained damage for not submitting a practice chart. The entire process was intended to motivate students to practice as they only way they could gain the in-game rewards was by practicing and submitting the practice chart.

In a literature review, Hamari et al. (2014) developed and categorized tables of gamification elements. The categories were based on gamification elements that impacted
motivation as identified in several empirical studies covered in the review. Gamification elements included within the present study’s Classcraft unit are the use of points, achievements or badges, leveling up, a compelling story, clear goals, feedback, rewards, progress, and challenge (see Table 3-2). These elements also helped to establish the unit’s fidelity of implementation to ensure that the participants experienced gamification.

Table 3-2. A table of the gamified elements employed in the study’s Classcraft unit.

<table>
<thead>
<tr>
<th>Gameplay affordance/ element</th>
<th>Included within the deliberate practice quests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Points</td>
<td>Players will experience receiving or losing Health Points (HP), Experience Points (XP) and Action Points (AP) within gameplay.</td>
</tr>
<tr>
<td>Achievements or Badges</td>
<td>Through leveling up, players earn badges that allow for special powers that can manifest within the game or in the classroom. They can also improve or modify their equipment as signs of achievement within the game.</td>
</tr>
<tr>
<td>Levels</td>
<td>As students gain XP through turning in practice charts, boss battles, and progressing through the quests, they are able to increase their avatars’ power levels and abilities.</td>
</tr>
<tr>
<td>Story</td>
<td>The students will participate in the researcher-designed deliberate practice quests in Classcraft.</td>
</tr>
<tr>
<td>Feedback</td>
<td>Feedback is gained through tiering in-game rewards (XP, HP, AP, or Gold Pieces – GP).</td>
</tr>
<tr>
<td>Rewards</td>
<td>Players will receive XP, HP, AP, or GP when submitting practice charts, by progressing through the quests, winning boss battles, and through randomized events.</td>
</tr>
<tr>
<td>Progress</td>
<td>Student participants will progress through outlined quests and experience random events that may positively or adversely affect student avatars.</td>
</tr>
<tr>
<td>Challenge</td>
<td>Each week, the practice chart submissions will become more demanding. The number of questions within the final Boss Battle will be greater than the mid-quest Boss Battle. The randomized event tool (The Riders of Vay) may make gameplay harder.</td>
</tr>
</tbody>
</table>
Goal-Based Practice Chart and Assessment

Participants used a goal-based practice chart that aligned with the principles of Elliot and Church’s Achievement Goal Theory (1997). In order to gain a sense of accomplishment, students must be able to experience success and progress through the fulfillment of goal-based practices. Additionally, these behaviors, along with motivation, self-regulation, and well-being, are developed in the pursuit of mastery goals through tasks (Church et al., 2001; Elliot & Dweck, 1988; Ryan & Deci, 2000). By providing the student participants opportunities to fulfill small, achievable tasks and skills to achieve those goals more efficiently, it may lead students to mastery or at least to a level of performance competency (Elliot & Church, 1997). Additionally, the appropriate construction of instructional goals, which include planned experiences, opportunities for self-monitoring, meaningful feedback, and student autonomy, will incorporate the process of deliberate practice within the use of a goal-based practice chart (Barry & Hallam, 2002; Ericsson, Kramp, & Tesch-Römer 1993; West, 2013).

In order to establish consistent goals across the study as well as for the instructional goals and assignments already established by the band director, the use of a goal-based practice chart handout (see Table 3-3) designed by Bauer (2016) was incorporated with the use of Classcraft platform by way of a five-week instructional unit (Appendix F). Students were prompted to submit their practice alongside their practice assignments to be awarded through the Classcraft platform. Throughout each day of the five weeks, the students were instructed to go down the column each day and fulfill each of the assigned tasks. These tasks were constructed via the instructional goals for the band director while using practice strategies referenced by Kolthammer (2009) and Schatt (2013), and other strategies from the literature. Over the time of the study, the students began to develop, suggest, and implement independent practice goals and strategies through the assistance of myself, the band director, and through individual autonomy.
and placed them within their individual practice charts. The students were also introduced to a rubric (see Appendix K) that sought to help them self-assess the quality of their practicing with the learned strategies. The strategies are to include the following:

1. Marking up one’s music (Austin & Berg, 2006, Drayton, 2013; Kolthammer, 2009; Schatt, 2013)
2. Slowing down the music for accuracy (Kolthammer, 2009; Miksza, 2015; Schatt, 2013)
3. Chunking music into smaller parts and repetition for accuracy and fluency (Holmes-Davis, 2015; Kolthammer, 2009; Miksza, 2015; Schatt, 2013)
4. Thinking and singing out the music before practicing (Kolthammer, 2009; Schatt, 2013)
5. Clapping and counting out the music (Hallam, 2001; Kolthammer, 2009; Miksza, 2007)

Students were prompted to turn in their practice chart once a week.
Table 3-3. Sample of a Goal-Based Practice Chart. Bauer (2016)

<table>
<thead>
<tr>
<th>Day One</th>
<th>Day Two</th>
<th>Day Three</th>
<th>Day Four</th>
<th>Day Five</th>
<th>Day Six</th>
<th>Day Seven</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Posture/Playing Position</strong></td>
<td>Check that you are sitting tall, on the edge of your chair. Be sure you are holding your instrument as described in class.</td>
<td>Check that you are sitting tall, on the edge of your chair. Be sure you are holding your instrument as described in class.</td>
<td>Check that you are sitting tall, on the edge of your chair. Be sure you are holding your instrument as described in class.</td>
<td>Check that you are sitting tall, on the edge of your chair. Be sure you are holding your instrument as described in class.</td>
<td>Check that you are sitting tall, on the edge of your chair. Be sure you are holding your instrument as described in class.</td>
<td>Check that you are sitting tall, on the edge of your chair. Be sure you are holding your instrument as described in class.</td>
</tr>
<tr>
<td><strong>Long Tone Warmup Exercises</strong></td>
<td>#1 &amp; #2 Breath deeply and keep a steady stream of air moving through your instrument.</td>
<td>#1 &amp; #3 Play slowly and with your best sound.</td>
<td>#2 &amp; #3 Play slowly and with your best sound.</td>
<td>#1 &amp; #2 Breath deeply and keep a steady stream of air moving through your instrument.</td>
<td>#1 &amp; #3 Play slowly and with your best sound.</td>
<td>#1, 2 &amp; #3 Breath deeply and keep a steady stream of air moving through your instrument.</td>
</tr>
<tr>
<td><strong>C Major Scale</strong></td>
<td>2X</td>
<td>2X</td>
<td>3X</td>
<td>2X</td>
<td>2X</td>
<td>3X</td>
</tr>
<tr>
<td><strong>1 octave chromatic scale starting on Bb</strong></td>
<td>3X at a slow, medium, and fast tempo</td>
<td>2X</td>
<td>3X at a slow, medium, and fast tempo</td>
<td>2X</td>
<td>3X at a slow, medium, and fast tempo</td>
<td>2X</td>
</tr>
<tr>
<td><strong>Method Book, Exercise #23</strong></td>
<td>Play slowly, being sure to slur all notes as indicated. Play 2X.</td>
<td>Play slowly, being sure to slur all notes as indicated. Play 2X.</td>
<td>Play slowly, being sure to slur all notes as indicated. Play 2X.</td>
<td>Play slowly, being sure to slur all notes as indicated. Play 2X.</td>
<td>Play slowly, being sure to slur all notes as indicated. Play 2X.</td>
<td>Play slowly, being sure to slur all notes as indicated. Play 2X.</td>
</tr>
<tr>
<td></td>
<td>Day One</td>
<td>Day Two</td>
<td>Day Three</td>
<td>Day Four</td>
<td>Day Five</td>
<td>Day Six</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>**Method Book,</td>
<td>Practice this using 3 different practice strategies</td>
<td>Practice this using 3 different practice strategies</td>
<td>Practice this using 3 different practice strategies</td>
<td>Practice this using 3 different practice strategies</td>
<td>Practice this using 3 different practice strategies</td>
<td>Practice this using 3 different practice strategies</td>
</tr>
<tr>
<td>Exercise #26</td>
<td>Work to memorize m. 1-8 from memory</td>
<td>Play m. 1-8 from memory</td>
<td>Play m. 1-12 from memory</td>
<td>Play m. 1-12 from memory</td>
<td>Play m. 1-16 from memory</td>
<td>Play m. 1-16 from memory</td>
</tr>
<tr>
<td><strong>Solo</strong></td>
<td>Choose at least one song to play</td>
<td>Choose at least one song to play</td>
<td>Choose at least one song to play</td>
<td>Choose at least one song to play</td>
<td>Choose at least one song to play</td>
<td>Choose at least one song to play</td>
</tr>
<tr>
<td>**Famous Popular</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Songs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Field Note Journals

During the Classcraft unit, observational field notes were taken by to gather relevant data in real time. I traveled to the hosting school once a week to introduce each of the new quests, collect practice charts on the goal-based practice strategy lessons, administer a boss battle, and conduct the bell-ringer Riders of Vay event. Outside of the initial introductory session, the bell-ringer took between five to seven minutes to complete each day in respects to the band director’s rehearsal time. Field notes were taken after the day’s interaction with the students and focused on the student participants’ reactions to the lessons and the daily bell-ringer activity. My field note journaling centered around three questions to help maintain relevant data. Those questions included the following:

1. Do the students understand the learned practice strategy of the week?
2. Do the students seem more motivated and engaged while using Classcraft?
3. What are the students’ daily reactions to the game?

After each observation, the notes were reviewed and transcribed in order to prevent vague interpretations during later analysis (Yin, 2012).

Band Director Interview and Student Focus Groups

Further qualitative data for this case study was gathered through an interview with the band director and two focus groups of selected students after the completion of the procedure (see Appendices G & H). The questions used for the interview and focus group protocols include modified items from a follow-up survey on parent/guardian perceptions of student growth through guided practice (Picone, 2012) in addition to items about video gaming experiences from Wood (2011). Picone (2012) studied the nature of guided practice of middle school students, examining participants’ perceptions of the quality of their practice habits. The items in Picone’s mid-point questionnaire and post-interview protocols were based on past studies (Lowe, 2011; Miksza, 2012; McCormick & McPherson; 2003; Reeve & Tseng, 2011; Ritchie & Williamon,
2011; Schatt, 2011) and grounded in self-regulation theory. Two student focus groups were used to account for students who fully participated in the Classcraft quests and those who did not. The purposeful selection of a group of three students who excelled at the Classcraft unit as well as a group of three disengaged students provided a more compelling understanding of emergent perceptions found during gameplay.

**Procedure**

Upon the approval of the University of Florida Institutional Review Board (IRB) (see Appendix A, I asked the band director of the selected school to participate in the study (see Appendices B and D). I also requested permission from the school’s principal (see Appendix C) to conduct the study. After the band director and principal provided their consent, informed consent forms were distributed to the parents and/or guardians of the middle school band students, and the students were asked to complete an assent form (see Appendices E and F). Those students who did not provide consent were still allowed to have the opportunity to participate in the activities of the study, but their data was not used in the analysis or reporting. There was no more than minimal risk to the participants, and they had the opportunity to leave the study at any time. At the end of the introduction, the students were given their student assent forms to sign as well as the parent/guardian consent forms to take home to be signed and turned in. The students signed their assent forms in class, were provided a week to turn in their parental consent forms and reminded the day before the official start of the project. Due to the effects of attrition due to students forgetting to submit their consent forms in a timely fashion, the official number of participants for the project turned out to be 16.

After receiving parent/guardian consent and student assent, I administered the Musical Practice and Digital Gamification Questionnaire (MPDGQ) (see Appendix H) to ascertain demographics and participants’ perceptions of motivation, musical practice, and gamification.
The questionnaire was completed by the students on their Chromebooks at school under my guidance. Following this, each of the participating students were provided access to an account on Classcraft (2013) and chose an in-game avatar. Once the students had their avatars set up, they were divided into two teams, Team Brass and Team Reeds & Percussion, according to their instrument family and more stable distribution of the team numbers.

I then introduced the Classcraft web-platform to the students via a computer and overhead projection system and had them engage in an introductory "quest" to orient them to the platform. Some of the tasks for the tutorial quest will included designing their avatars, selecting powers and customizable pets, learning the rules of the game, and acclimating students to the online platform. From there, the participants completed tutorial quests based on the topics of deliberate practice, practice strategies, the development of practice goals, and the use of the goal-based practice chart. An overview of all the study’s sequence can be found in the table of weekly procedures (See Appendix I).

Data

To answer the research questions for the study, a convergent parallel mixed-methods design within a case study was used to collect both quantitative and qualitative data (see Figure 3-1). The analysis of the data took place concurrently in this study. The Musical Practice and Digital Gamification Questionnaire (MPDGQ) administered before and after the Classcraft unit presented the participants of the study with items within the themes of motivation, knowledge of practice strategies, and perceptions of learning through digital games. The learning of practice strategies by the student participants was assessed via a goal-based practice chart and by the use of a rubric (Appendix L) found within the quest for evidence of the strategies learned from the Classcraft quests and to self-regulate their practice sessions. Further assessment was conducted by way of an in-class boss battle within the game. The final aspect of the data analysis consisted
of the transcribing, coding, and organization of patterns found within the practice charts, field
notes, student focus groups, and a band director interview. As with the nature of the study,
special attention was given to the major themes of motivation, knowledge and application of
practice strategies, and perceptions towards digitally gamifying practice habits.

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Research Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPDGQ Pre-Test/Descriptive Statistics</td>
<td>How does digital gamification impact band student's motivation to practice?</td>
</tr>
<tr>
<td>Classcraft Procedure/In-game Analytics</td>
<td>How can digital gamification be used to teach students practice strategies?</td>
</tr>
<tr>
<td>MPDGQ Post-Test/Descriptive Statistics and Wilcoxon Z</td>
<td>What are the students' and teachers' attitudes and perceptions of the digital</td>
</tr>
<tr>
<td>Field Notes/Coding and Categorization</td>
<td>gamification process?</td>
</tr>
<tr>
<td>Journals/Coding and Categorization</td>
<td></td>
</tr>
<tr>
<td>Student Focus Groups/Coding and Categorization</td>
<td></td>
</tr>
<tr>
<td>Band Director Interview/Coding and Categorization</td>
<td></td>
</tr>
</tbody>
</table>

Figure 3-1. The research questions and their corresponding data sources and analyses.

Because the number of participating students was too small to use parametric statistical
analyses, I used descriptive statistics and the non-parametric Wilcoxon signed-rank test to
examine the quantitative data generated in this study. The Wilcoxon signed-rank test, set to a risk
value of $p \leq .05$, was used to identify any significant differences between the pre- and posttest
questionnaire data. Russell (2018) explained that the Wilcoxon analysis allows for the reporting
of significance as like a two-tailed t-test, yet the researcher does not have to be concerned for the
normalcy of distribution as long as the dependent variable is ordinal and there are no more than two observations of that same variable.

To understand how digital gamification may be used to teach students how to practice effectively, a combination of observational field notes and three interview sessions were used to gather relevant data. The responses to the protocol from the two student focus groups and the band director interview were analyzed by way of pattern matching and categorization (Yin, 2017). The theoretical lenses that the patterns were focused and coded around were motivation, knowledge of practice strategies, application of practice strategies, and perceptions of learning through a digital gamification process. The observations from the field notes in addition to the responses to specific prompts from the focus groups with selected student participants and an interview with the band director were coded, analyzed, and interpreted for patterns within the data and for emergent themes.

For data gathered from the focus groups and band director interview, I first transcribed the recordings made during these events. For the transcription of the focus group responses, I provided each participating student a pseudonym to maintain confidentiality. After the band director’s interview was transcribed, I provided the band director with copies of the transcripts from our interview and the student focus groups to verify that they were accurate (member-checking). Using the HyperResearch software application, I then coded the transcript data by matching it with the study’s research questions (see Appendix G), seeking pattern matching and categorization (Yin, 2017). I tallied the frequency of similar responses within focus group #1 ($n = 3$), focus group #2 ($n = 3$), comparing that with the interview data for triangulation.

**Validity and Reliability**

The validity of the MPDGQ was established through the use of the table of specification (see Appendix G) which aligns the questionnaire items to themes from the existing research
literature. It was also reviewed by a panel of experts. The use of Cronbach’s Alpha determined the reliability of the MPDGQ. Tests for reliability through Cronbach’s Alpha produced the results of .889 (Motivation), .882 (Practice Knowledge), and .802 (Digital Gamification) for the pre-test distribution and .894 (Motivation), .752 (Practice Knowledge), and .848 (Digital Gamification) for the posttest distribution.

The validity of the qualitative data was established by making sure the student focus group and teacher interview manuscripts did not contain mistakes after transcription. For trustworthiness, I provided the band director with a copy of the transcripts from the interview and focus group to verify that they were accurate (member-checking) in which she verified. Using the HyperResearch software application, I then coded the transcript data by matching it with the study’s research questions (see Appendix G), seeking pattern matching and categorization (Yin, 2017) and addressed any inaccuracies that may have been present. Finally, both the quantitative data (results of the MPDGQ) and qualitative data (practice charts, focus group, interview, and field notes) were triangulated for the accuracy of the study.

The Role of the Researcher and Bias

In all transparency, I am a self-professed retro-video gamer. This means that video games found in shopping mall arcades from the late 1980’s and early 1990’s and titles developed for home game consoles such as the Nintendo Entertainment System, Sega Genesis, Sony PlayStation, and others of the sort helped to establish my social and musical constructs; some of which are grounded in research (Bean, 2015). The impact of such enjoyable experiences through gameplay and the music of video game soundtracks as a child would lead to future epiphanies upon my practicum within a middle school band classroom. While using a rhythm music video game with band students, I observed increased engagement and musical prowess among my students, despite concerns of the video game’s age by the students. This led to the thought that
while video game technology, as well as the approach and student perceptions of such technologies, have changed, the nature of playing video games can still be a factor to consider in the realm of classroom education and a relevant aid in music instruction within schools. Furthermore, to know if fellow music educators felt and observed the same phenomena with music video games became the prevailing cause for my research.
CHAPTER 4
RESULTS

The purpose of this study was to explore the potential of using digital gamification to motivate and develop middle school band students’ understanding of musical practice. This chapter includes the analysis of the quantitative and qualitative data gathered within the case study. Data were analyzed to address the following three research questions:

1. Does digital gamification affect band students’ motivation to practice?
2. Can digital gamification be used to teach students how to practice effectively?
3. What are the students’ and teacher’s attitudes and perceptions of the digital gamification process?

Digital Gamification and Motivation to Practice

The first research question was, "How does digital gamification impact band students’ motivation to practice?" Data sources used to examine this research question included (a) the amount of time the participants practiced, as reported on the pre- and post-test questionnaires, (b) data gathered in the motivation section of the pre- and post-test questionnaires, (c) field observations of participants, as captured in my research journal, (d) the focus groups, and (e) the interview with the band director. For this section, I will first address the quantitative data gathered by the MPDGQ report. Then, I will report on the emergent qualitative findings from the field note journal, practice chart submissions, focus groups, and band director interview.

Questionnaire Results

Practice Time. A practice time factor was created by multiplying the number of days per week participants reported they practiced by the amount of time they estimated they spent practicing on those days when they did practice. The questionnaire item related to time spent practicing per day yielded ordinal data ranging from ‘1’ – less than 10 minutes to ‘8’ – over 90 minutes. So, for example, if a participant indicated she practiced 5 days a week for less than 10
minutes each time, her practice time factor was calculated as ‘5’ (5 days multiplied by 1–less than 10 minutes). Because the data did not meet the assumptions necessary for parametric statistical analysis, the nonparametric Wilcoxon signed-rank test was calculated to analyze if there was any change in the time participants spent practicing between the pre- and post-test. No significant difference was found ($Z = .68, p = .50, r = -.12$) between the pre- ($M = 17.3, SD = 10.4$) and post-test ($M = 15.1, SD = 7.34$) practice time factor scores.

**Motivation.** Items 12 to 23 of the questionnaire (see Appendix G) were designed to assess participants’ motivation to practice. Using a 5-point Likert-type scale (1 = Completely Disagree, 2 = Disagree, 3 = Not Sure, 4 = Agree, 5 = Completely Agree, participants rated each questionnaire item. As a first step in analyzing the motivation data, the ratings of the 12 questionnaire items were summed to create an overall motivation score. A maximum motivation score of 60 was possible. Then, a Wilcoxon signed-rank test was calculated between the pre- ($M = 38.40, SD = 8.10$) and post-test ($M = 39.3, SD = 7.20$) motivation scores to determine if there was any significant difference. No significant difference was found ($Z = -.31, p = .76, r = -.06$).

Following analysis of the overall motivation scores, descriptive statistics were calculated for the pre- and posttest scores of each motivation item on the questionnaire (see Table 4-1). In the pretest, the top items the participants indicated as motivators were (a) “I enjoy when I improve some of my weak points ($M = 4.27, SD = .80$), (b) “I practice because I feel really good about myself when I get better at challenging skills” ($M = 3.81, SD = .91$), and (c) “I enjoy when I learn new musical skills that I have never tried before” ($M = 3.81, SD = .75$). In contrast, the factors ranked as least motivational were (a) “I must practice to feel good about myself” ($M = 2.31, SD = .79$), (b) “I practice because I believe that practicing my instrument is one of the best always to meet people” ($M = 2.44, SD = 1.09$), and (c) “I practice to show others how good I am
at music” ($M = 2.63, SD = 1.15$). Participants’ ratings of the items on the posttest varied somewhat from their pretest ratings. A Wilcoxon signed-ranks test was calculated to determine if there were any significant differences between the pre- and posttest means of the 12 motivational questionnaire items. A significant difference ($Z = -2.33, p = .02, r = -.41$) was found between the pre- ($M = 4.27, SD = .80$) and posttest ($M = 3.88, SD = .89$) ratings of “I enjoy when I improve some of my weak points. Likewise, a significant difference ($Z = -2.12, p = .03, r = -.36$) was also found between the pre- ($M = 4.27, SD = .80$) and posttest ($M = 3.88, SD = .89$) means of “I would feel bad if I was not taking time to practice” (see Table 4-1).
<table>
<thead>
<tr>
<th>Items</th>
<th>Pre-Test</th>
<th>Post-Test</th>
<th>Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>*I enjoy when I improve some of my weak spots.</td>
<td>4.27</td>
<td>.80</td>
<td>3.88</td>
<td>.89</td>
</tr>
<tr>
<td>I enjoy when I learn new musical skills that I have never tried before.</td>
<td>3.81</td>
<td>.75</td>
<td>4.00</td>
<td>.89</td>
</tr>
<tr>
<td>I practice because I feel really good about myself when I get better at challenging skills.</td>
<td>3.81</td>
<td>.91</td>
<td>3.62</td>
<td>.81</td>
</tr>
<tr>
<td>I feel excited when I am really involved in practicing.</td>
<td>3.75</td>
<td>.93</td>
<td>3.88</td>
<td>1.09</td>
</tr>
<tr>
<td>I practice because I enjoy discovering new musical skills.</td>
<td>3.44</td>
<td>.81</td>
<td>3.37</td>
<td>.81</td>
</tr>
<tr>
<td>I believe that practicing my instrument is one of the best ways I have chosen to develop other parts of myself.</td>
<td>3.47</td>
<td>.74</td>
<td>3.31</td>
<td>1.0</td>
</tr>
<tr>
<td>I feel strong emotions when I make music that I like.</td>
<td>3.13</td>
<td>.96</td>
<td>3.37</td>
<td>.89</td>
</tr>
<tr>
<td>*I would feel bad if I was not taking the time to practice.</td>
<td>3.06</td>
<td>1.12</td>
<td>3.44</td>
<td>.81</td>
</tr>
<tr>
<td>I practice because I know that practicing my instrument allows me to be well thought of by people that I know.</td>
<td>3.00</td>
<td>1.03</td>
<td>2.88</td>
<td>.81</td>
</tr>
<tr>
<td>I practice to show others how good I am at music.</td>
<td>2.63</td>
<td>1.15</td>
<td>2.87</td>
<td>1.03</td>
</tr>
<tr>
<td>I practice because I believe that practicing my instrument is one of the best ways to meet people.</td>
<td>2.44</td>
<td>1.09</td>
<td>2.56</td>
<td>.81</td>
</tr>
<tr>
<td>I must practice to feel good about myself.</td>
<td>2.31</td>
<td>.79</td>
<td>2.06</td>
<td>.68</td>
</tr>
</tbody>
</table>

Items were responded to using a five-point Likert-type scale: 1 = Completely Disagree, 2 = Disagree, 3 = Not Sure, 4 = Agree, 5 = Completely Agree

* Significant difference between pre- and post-test ratings.

**Improving Through Practice**

At the conclusion of the study, participants were selected for two focus groups. Focus group #1 was comprised of three students who had in-game avatars (digitalized representations of the gamer) that had lower experience levels (tiered stages of progress within a game) at the
end of the project while focus group #2 was comprised of three student participants who were identified as those who had avatars with higher experience levels in the Classcraft quest. The focus groups each met separately for approximately 20 minutes. The focus group protocol can be seen in Appendix J.

Participants in both focus groups indicated that they knew practicing was important and that their motivation to practice was often driven by a desire to improve their (a) general playing abilities, and (b) sections of their music that presented technical challenges. Focus group #2 member, Taylor, stated “So I do think that the more you practice, the better your outcome will be because I think that practicing is an important part of being better.” Alex, a member of focus group #1, also mentioned the importance of practice to improving instrumental skill: “For me, I feel like, umm, putting more effort into practicing often really helps improve (my) skill.” Parker, who was in focus group #2, seemed to indicate that the activities that were part of the study helped to motivate more consistent practice, stating, “Maybe I can hear a difference (musical growth) because it (the Classcraft quests and goal-based practice charts) makes you practice more every day.” In addition, impending performances seemed to provide motivation. Kyle, a member of focus group #1, stated, “But, just depending on what’s happening, like if there’s a concert and there’s concert pieces, I usually tend to practice more because there’s more songs to practice. And what I need to make sure I’m good at.”

The focus group participants indicated that their motivation to practice also increased when they felt a sense of accomplishment when improving a musical skill through (a) the completion of the assigned practicing tasks and (b) overcoming challenging musical passages. Blake, a member of focus group #1 addressed the growth experienced through the number of practice items assigned through the goal-based practice charts: “We had a lot of pieces to
practice, and I could tell it was getting better. And I could play it (concert music) faster.”

Brooklyn, a student in focus group #2, stated that students needed to challenge themselves on parts with greater difficulty in order to grow in skill: “Because if you don’t focus on the more difficult parts, you’re not going to get that much better.”

Focus group #2 participants also seemed to agree that the Classcraft and goal-based practice chart process helped students to continually engage in practicing and track their growth in musical skills, therefore increasing practice motivation. Parker (FG #2) noticed how using the goal-based practice chart with the game resulted in frequent practicing: “Maybe I can hear a difference because it makes you practice more every day. The practice charts helped me to get better because I’m practicing more and more.” Additionally, being able see the progress of what was being worked on via the goal-based practice chart and through the growth of experience levels with their Classcraft avatar seemed to assist students to focus in their practicing, according to focus group #2 member Taylor: “I think I am able to hear with the practice chart; to see what I need to work on and see the problems that I have and what I can work on.”

The band director also appeared to appreciate how the learning of practicing strategies through Classcraft, coupled with the organization of the goal-based practice charts, may have motivated some of the students. She observed how the learning process through Classcraft guided the practice of concert scales for the end of the year scale tests, attributing some of the students’ success to what they had learned by participating in this study:

Well I do think that overall that final scales test that I gave was better than it’s been in years past. And I would like to be able to contribute some of it to the very specific practice that was going on with Classcraft. I’ve been directing for a while and those scale tests at the end of the year are sometimes painful. But I feel that it’s something…it’s just like a rite of passage…you’ve got to do it. You got to work on it, you know? And there’s 50% of the class that works really hard and is really prepared and their scales sound good. And then there’s another chunk of the class where they just didn’t put in the time and it’s like painful for us to all have
to sit and listen to it. But I made up this 50%...I don’t actually mean those numbers. But I think that there were much less...there were much less painful scale tests this year than there have been in the past. I’d like to think that maybe that was some of the reason.

The band director also observed that learning a new way of practicing was not every students’ priority at the end of the school year: “Students get really apathetic about everything. And you saw that, with the lower scores, or they’re not even turning in the forms.” This observation was coupled with the band director’s understanding that students who already had developed a method of practicing from their prior study will practice and be prepared regardless: “The kids that excel in here are the kids that practice because they do what they’re told. I think that the kids that really excel are the kids that do have some natural ability, you know? And I think that they also practice really hard.”

**Feeling Good About One’s Self**

Both the focus groups and the band director appeared to stress importance towards students feeling good about themselves when practicing after the project due to (a) some of the students having strong convictions towards practice already and (b) how the activities of such a process could help promote meaningful learning and engagement. Alex, a student in focus group #1, mentioned their innate emotions towards practice as being an always-present construct: “For me, I mean, I guess I’ve always had a positive attitude towards practicing.” Similar sentiments were expressed by Brooklyn (FG #2) who seemed to have a sense of duty about practicing: “I’m not really forced to practice because it’s the kind of the thing you just do naturally. For me anyways. It doesn’t really matter when or where. As long as it gets done.”

Additionally, the band director mentioned the fact that video games used in this manner may not motivate every student. However, they could be resources to help find out the specific needs of learning and engagement among a music teacher’s class and encourage more students to
feel comfortable about practicing: “You know, meeting the needs; meeting the kids where they are and figuring out how to motivate them. And if it motivates them really well this year, that’s awesome.” This sentiment was shared by Brooklyn (FG #2): “If it’s a video game, most children are more than likely going to want to use that than just practicing in general. So, it might motivate them.”

**Discovering New Things to Practice**

Specifically, the participants in focus group #2 seemed to display a sense of open-mindedness by describing how the activities in this study helped them develop motivation to practicing through (a) discovering new music skills to practice and (b) encouraging more practicing sessions to find new skills. Taylor (FG #2) stated that the epiphanies experienced through the quests encouraged her (him?) to practice more: “I feel like it (Classcraft) really helped me practice and made me understand music more and helped me want to practice more.” Additionally, Taylor (FG #2) seemed to indicate that the learning of new practice strategies helped improve the motivation to practice: “But I think after learning all the new strategies to practicing, I think I got a little more open into practicing. And I think it helped me with that.” However, Alex (FG #1) introduced the viewpoint of how the game could have been even more motivating if there was a more robust reward experience embedded in the game’s design: “I feel like, if it were a reward-based system, it would be even more motivating.”

Furthermore, the process of goal setting alongside learning new practice strategies and using a goal-based practice chart during the project also appeared to be useful for helping students, like Parker (FG #2) to remind themselves of their set goals in order to improve: “It (the project) helped me because I learned new strategies in order to practice. And charted my practice goals, so I knew when to practice if I needed to.” This construct of the game was especially crucial to Brooklyn (FG #2) as goal setting, the learning of new strategies, and the use of those
strategies increased the student’s will to practice: “it did increase in motivation. I think that it taught me new strategies, especially when you, kind of like, “I don’t know what to do.”

Field Note Observations and Practice Charts

From the notes recorded in my field journal, the participants’ initial motivation to practice in order to receive benefits within Classcraft appeared to be high. The students seemed to enjoy developing their respective avatars after being awarded XP (experience points-units that allow players to “level up”, or strengthen, the in-game characteristics of their avatars) and GP (virtual gold pieces-units that allow players to “buy” accessories within the game to customize their avatars). Students were awarded XP and GP based when they (a) submitted practice charts, (b) successfully navigated various events within the game and won a boss battle (in-game competition with a digital antagonist). Additionally, there initially appeared to be a collective sense of purpose among the band students since the first three goal-based practice charts guided participants to what needed to be practiced for their final concert of the year. This was partly due to the band director specifying the sections of the music for students to practice, and that information being placed within the goal-based practice charts.

However, since this project took place close to the end of the school year, and since participants knew if practice charts were not submitted it would not adversely affect their grade, there was a sharp decline in practice chart submissions towards the end of the project (see Table 4-2). Additionally, some participating students either submitted completely blank practice charts or forgot them at home. This adversely affected their Classcraft rewards, and hence, the opportunity to develop their avatar. The result may have been a decreased motivation to practice.
Using Digital Gamification to Teach Students How to Practice Effectively

The second research question was, "Can digital gamification be used to teach students practice strategies effectively?" Data sources used to examine this research question included information (a) gathered in the practice knowledge section of the questionnaire, (b) from the student practice charts that were submitted, (c) produced by the focus group participants, and (d) resulting from the interview with the band director. For this section, I will first address the quantitative data gathered by the MPDGQ. Then, I will report on the emergent qualitative findings from the (a) field note journal, (b) practice chart submissions, (c) focus groups, and (d) band director interview.

Questionnaire Results

Knowledge and application of research-based practice strategies. Items 24 to 32 of the questionnaire gathered data about the participants’ overall understanding and use of the of research-based practice strategies (see Appendix G). Using a 5-point Likert-type scale (1 = Completely Disagree, 2 = Disagree, 3 = Not Sure, 4 = Agree, 5 = Completely Agree), participants rated their level of agreement with each questionnaire item (research-based strategy). To begin analyzing the practice data, a practice strategy score was created by summing the ratings of questionnaire items 24 to 33. A maximum score of 40 was possible. A Wilcoxon signed-rank test was calculated between the pre- \( (M = 32.9, SD = 6.39) \) and post-test \( (M = 39.3, \)
practice knowledge scores to determine if there was any significant difference. No significant difference was found ($Z = -.11, p = .91, r = -.02$).

After the analysis of the overall practice scores, descriptive statistics were calculated for the pre- and post-test ratings for each of the individual items (see Table 4-4). In the pretest, the top strategies with which participants were in agreement were (a) marking up music with a pencil ($M=4.38, SD = .96$), (b) repeating a measure or section until correct ($M=4.25, SD = .85$), and (c) chunking music into smaller sections ($M=4.06, SD = .85$). In contrast, the practice strategies they least agreed with included (a) singing out one’s part ($M = 2.75, SD = 1.29$), (b) using a practice chart ($M = 2.94, SD = .929$), and (c) setting goals for each practice session ($M = 3.19, SD = 1.11$). Participants’ ratings of the items on the posttest varied somewhat from their pretest ratings. A Wilcoxon signed-rank test was calculated between the pre- and post-test means of items 24-33 of the questionnaire to determine whether there were any significant differences between the pre- and posttest means of the practice strategy questionnaire items. No significant difference was found between the items (see table 4-3).

Table 4-3. Section III – Knowledge of Practice Strategies.

<table>
<thead>
<tr>
<th>Items</th>
<th>Pre-Test</th>
<th>Post-Test</th>
<th>Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>I believe marking the music with a pencil during practice is okay.</td>
<td>4.38</td>
<td>.96</td>
<td>4.19</td>
<td>.83</td>
</tr>
<tr>
<td>When practicing, I repeat a measure or section of a song until it is right.</td>
<td>4.25</td>
<td>.78</td>
<td>4.13</td>
<td>.62</td>
</tr>
<tr>
<td>I believe in breaking the song into smaller sections (or chunks) and then practicing those smaller sections.</td>
<td>4.06</td>
<td>.85</td>
<td>4.50</td>
<td>.73</td>
</tr>
<tr>
<td>When practicing, I play a measure or section of a song slowly.</td>
<td>3.88</td>
<td>.96</td>
<td>3.88</td>
<td>.72</td>
</tr>
<tr>
<td>I silently look at my music, thinking about and hearing my part in my head.</td>
<td>3.75</td>
<td>.78</td>
<td>3.50</td>
<td>1.03</td>
</tr>
</tbody>
</table>
Table 4-3. Continued.

<table>
<thead>
<tr>
<th>Items</th>
<th>Pre-Test</th>
<th></th>
<th>Post-Test</th>
<th></th>
<th>Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I count and clap rhythms when practicing.</td>
<td>3.69</td>
<td>1.14</td>
<td>3.63</td>
<td>1.03</td>
<td>-.09</td>
<td>.93</td>
</tr>
<tr>
<td>I believe I should set goals for each practice session.</td>
<td>3.19</td>
<td>1.11</td>
<td>3.63</td>
<td>.81</td>
<td>-1.47</td>
<td>.14</td>
</tr>
<tr>
<td>I believe I should plan my practice sessions using a practice chart.</td>
<td>2.94</td>
<td>.93</td>
<td>3.00</td>
<td>.63</td>
<td>-.28</td>
<td>.78</td>
</tr>
<tr>
<td>I sing through my part when practicing.</td>
<td>2.75</td>
<td>1.29</td>
<td>2.81</td>
<td>1.33</td>
<td>-.33</td>
<td>.74</td>
</tr>
</tbody>
</table>

Questions used a five-point Likert type scale: 1 = Completely Disagree, 2 = Disagree, 3 = Not Sure, 4 = Agree, 5 = Completely Agree

**Application of practice strategies.** Items 33 to 36 of the questionnaire queried participants about the effectiveness of five practice strategies, situated within four different scenarios (see Tables 4-4 through 4-7). Participants were asked to rank each strategy from most effective (1) to the least effective (5). It should be noted that the number of respondents varied between the pretest and posttest results. Table 4-5 shows the mean ranks for the pre- and posttest results. In addition, a Wilcoxon signed-rank test was calculated to determine whether there were any significant differences between the pre- and posttest ranks. Significant differences were found for (a) practicing with one’s hands only (no sound) as a strategy when working on longer, more difficult pieces of music \((M = 2.36, SD = .84, Z = -2.23, p = .03, r = -.41)\), and (b) starting a piece of music over and trying the song again until the notes are right as a way to avoid repeating mistakes when practicing \((M = 3.86, SD = .36, Z = -3.05, p = .00, r = -.57)\).
Table 4-4. Mean Rank of Practice Strategies - Rhythms.
If I’m practicing a song and I’m having trouble with the rhythms of the last few measures, what would be the best strategy to use?

<table>
<thead>
<tr>
<th>Strategy and Rank</th>
<th>Pretest (n = 16) M Rank</th>
<th>Pretest (n =16) SD</th>
<th>Posttest (n =16) M Rank</th>
<th>Posttest (n =16) SD</th>
<th>Z</th>
<th>p</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Break into pieces (chunking) – 1</td>
<td>2.19</td>
<td>1.22</td>
<td>2.06</td>
<td>1.12</td>
<td>-0.34</td>
<td>.73</td>
<td>-0.06</td>
</tr>
<tr>
<td>Write in Counting – 2 (3-Post)</td>
<td>2.44</td>
<td>.89</td>
<td>2.38</td>
<td>1.15</td>
<td>-0.33</td>
<td>.74</td>
<td>-0.06</td>
</tr>
<tr>
<td>Clap and Count – 3 (2-Post)</td>
<td>2.56</td>
<td>1.55</td>
<td>2.31</td>
<td>1.20</td>
<td>-1.16</td>
<td>.25</td>
<td>-0.21</td>
</tr>
<tr>
<td>Repeat Rhythm – 4</td>
<td>3.37</td>
<td>1.31</td>
<td>3.69</td>
<td>1.01</td>
<td>-1.51</td>
<td>.13</td>
<td>-0.27</td>
</tr>
<tr>
<td>Start Over – 5</td>
<td>4.44</td>
<td>.81</td>
<td>4.56</td>
<td>.81</td>
<td>-0.71</td>
<td>.48</td>
<td>-0.13</td>
</tr>
</tbody>
</table>

Questions used a rank-order scale ranging from 1=Most effective strategy to 5= Least agreeable strategy.
* Statistical significance.

Table 4-5. Mean Rank of Practice Strategies – Fast Sections.
If I’m practicing a song and I’m having problems with a fast section with a lot of notes, what would be the best strategy to use?

<table>
<thead>
<tr>
<th>Strategy and Rank</th>
<th>Pretest (n =14) M Rank</th>
<th>Pretest (n =14) SD</th>
<th>Posttest (n =14) M Rank</th>
<th>Posttest (n =14) SD</th>
<th>Z</th>
<th>p</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Play Slower – 1</td>
<td>1.36</td>
<td>.50</td>
<td>1.71</td>
<td>.83</td>
<td>-1.41</td>
<td>.16</td>
<td>-0.27</td>
</tr>
<tr>
<td>Break into pieces (chunking) – 2</td>
<td>2.14</td>
<td>.86</td>
<td>1.93</td>
<td>1.00</td>
<td>-1.03</td>
<td>.31</td>
<td>-0.20</td>
</tr>
<tr>
<td>Practice with hands/ no sound – 3</td>
<td>3.07</td>
<td>1.27</td>
<td>2.93</td>
<td>1.21</td>
<td>-0.18</td>
<td>.86</td>
<td>-0.03</td>
</tr>
<tr>
<td>Repeat over and over – 4</td>
<td>3.79</td>
<td>.70</td>
<td>3.79</td>
<td>.80</td>
<td>-0.26</td>
<td>.79</td>
<td>-0.05</td>
</tr>
<tr>
<td>Start over until right – 5</td>
<td>4.64</td>
<td>.63</td>
<td>4.64</td>
<td>.63</td>
<td>-1.00</td>
<td>.32</td>
<td>-0.19</td>
</tr>
</tbody>
</table>

Questions used a rank-order scale ranging from 1=Most effective strategy to 5= Least agreeable strategy.
* Statistical significance.

Table 4-6. Mean Rank of Practice Strategies – Longer and More Difficult Music.
If I’m having trouble practicing a longer, more difficult piece of music, what would be the better strategy to use?

<table>
<thead>
<tr>
<th>Strategy and Rank</th>
<th>Pretest (n =14) M Rank</th>
<th>Pretest (n =14) SD</th>
<th>Posttest (n =15) M Rank</th>
<th>Posttest (n =15) SD</th>
<th>Z</th>
<th>p</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Break into pieces (chunking) – 1</td>
<td>1.21</td>
<td>.43</td>
<td>1.40</td>
<td>.74</td>
<td>-.65</td>
<td>.52</td>
<td>-.12</td>
</tr>
<tr>
<td>* Practice with hands/ no sound – 2</td>
<td>2.36</td>
<td>.84</td>
<td>2.33</td>
<td>.98</td>
<td>-2.23</td>
<td>.03</td>
<td>-.41</td>
</tr>
<tr>
<td>Rhythms correct, pitches incorrect - 3</td>
<td>2.71</td>
<td>.91</td>
<td>2.80</td>
<td>.86</td>
<td>-.19</td>
<td>.85</td>
<td>-.04</td>
</tr>
<tr>
<td>Start over until right – 4</td>
<td>3.93</td>
<td>.73</td>
<td>3.53</td>
<td>.92</td>
<td>-1.52</td>
<td>.13</td>
<td>-.28</td>
</tr>
<tr>
<td>Move on to an easier piece – 5</td>
<td>4.79</td>
<td>.43</td>
<td>4.93</td>
<td>.26</td>
<td>-1.73</td>
<td>.08</td>
<td>-.32</td>
</tr>
</tbody>
</table>

Questions used a rank-order scale ranging from 1=Most effective strategy to 5= Least agreeable strategy.
* Statistical significance.
Table 4-7. Mean Rank of Practice Strategies – Error Prevention.
To make sure I don’t make the same mistake again in the music I practice, what would be the best strategy to use?

<table>
<thead>
<tr>
<th>Strategy and Rank</th>
<th>Pretest (n = 14)</th>
<th>Posttest (n =15)</th>
<th>Z</th>
<th>p</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M Rank</td>
<td>SD</td>
<td>M Rank</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Use a pencil – 1</td>
<td>1.57</td>
<td>.76</td>
<td>1.13</td>
<td>.52</td>
<td>-1.89</td>
</tr>
<tr>
<td>Look, think, and sing – 2 (3-Post)</td>
<td>2.07</td>
<td>1.00</td>
<td>3.00</td>
<td>.76</td>
<td>-1.83</td>
</tr>
<tr>
<td>Practice with fingers – 3 (2-Post)</td>
<td>2.50</td>
<td>.76</td>
<td>2.33</td>
<td>.82</td>
<td>-1.16</td>
</tr>
<tr>
<td>* Start over until right – 4</td>
<td>3.86</td>
<td>.36</td>
<td>3.67</td>
<td>.82</td>
<td>-3.05</td>
</tr>
<tr>
<td>Move on to an easier piece – 5</td>
<td>5.00</td>
<td>.00</td>
<td>4.87</td>
<td>.35</td>
<td>-1.00</td>
</tr>
</tbody>
</table>

Questions used a rank-order scale ranging from 1=Most effective strategy to 5= Least agreeable strategy.
* Statistical significance.

Practice Charts
The band director and the focus group participants both acknowledged that the use of the goal-based practice charts in addition to the Classcraft quests had a positive effect on (a) the organization of students’ practicing sessions and (b) the learning and use of the practice strategies as experienced in the Classcraft quests. When addressing the Classcraft project game’s design, the band director was initially against the possible use of a practice chart. The band director’s disdain was due in part to her previous use of traditional practice charts in the classroom:

I would be like, ‘Alright! We’re collecting these today!’ And you would see the kids scurrying and filling out the charts real quick before they handed them in. And maybe they practiced and maybe they worked on it and just didn’t write it down, right?

However, the band director appreciated the goal-based practice chart process of listing specific practice goals and strategies for students. Additionally, the ability to edit awards towards goal-based practicing to correspond with the game’s design was an element of the Classcraft project that the band director seemed to value. She also mentioned that the use of the goal-based practice charts to work on specific items, such as scales or harder sections of concert music, was similar to the practice homework the students had been previously assigned:
And my take on it is that Classcraft (in addition to the goal-based practice charts) gives them really specific things. Even probably even more specific than some of my Canvas assignments do. Some of them, you know for sure. And they’re used to those specific practice things.

Furthermore, the band director stressed the importance that students should have specific lists of items on their goal-based practice charts to help guide their practicing. While not being a big fan of using traditional practice charts after trial and error over the years, the band director did support the use of the goal-based practice charts: “They’re middle schoolers! They don’t know how to practice. They don’t know what to practice. They don’t know, like, where’s the accountability? I think that they need that.”

The students in focus group #2 felt that using the goal-based practice charts, alongside Classcraft gameplay, may have helped them achieve their practicing goals through strategies learned through the quests. Taylor (FG #2) mentioned this process in addition to the use of two strategies (clapping and counting, and chunking) learned within the Classcraft quests:

So, I think that after the Classcraft (project), I was more organized with my practicing. I used clapping through the rhythms, like, if it was a hard rhythm. Or singling out the section that was harder for me and I think that helped me organize my music more and helped me focus on what I really needed to study in my music…to work on.

Goal Setting

The process of goal setting appeared to be beneficial to participants. Blake, a student in focus group #1, expressed how randomized their practicing was: “to remind myself, I make a list usually. I feel like mine is still a little bit random. But I do set goals for myself now.” However, Alex (FG #1) did appear to agree that was better able to organize his practice sessions based on what he had learned through the Classcraft quests: “I guess Classcraft (the project) did help a little bit with setting a goal.”
Practice Strategies

The Classcraft quests introduced the researched practice strategies of the study sequentially over five-weeks. The first week introduced marking the music with a pencil and slowing down one’s practicing. In week two, the strategy of slowing down the music was introduced. Chunking music into smaller sections was described in week three and week four focused on thinking and singing. Finally, in week five, clapping and counting out music was emphasized. In class, the band director would instruct the students to correct errors with their pencils and encourage the process of thinking and singing of parts in their heads. Additionally, the band director utilized repetition and slowing down particular passages when rehearsing the music the band was preparing for their concert.

Only two of these practice strategies were reported by the students on the submitted goal-based practice charts (see Table 4-8). The clapping and counting strategy, more evident within the in-class rehearsals from classroom observations, was the most mentioned strategy with five students mentioning this strategy within the practice chart submissions. Additionally, the chunking of sections for practice had evidence within four practice charts submissions. Unfortunately, many of the student participants did not report their used strategies on their goal-based practice chart submissions despite being prompted to do so each week of the project.

Table 4-8. Reported Uses of Practice Strategies through the Practice Chart Submissions.

<table>
<thead>
<tr>
<th></th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
<th>Week 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marking up the Music</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Slowing Down</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Chunking</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Think and Sing</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Clap and Count</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total number of charts, $N = 45$
**Chunking.** The focus groups, as well as the rest of the participating students, believed that chunking, or the breaking down of music into smaller, manageable sections, was an effective practice strategy emphasized by the Classcraft project. Both focus groups referred to the practice strategy at least twice in their separate interviews. Parker (FG #2) found that chunking was an excellent way of singling out harder parts within the assigned music: “I think one of the strategies that helped me was breaking it down into chunks and isolating it…like the difficult parts and not just keep going over and over it.” Additionally, Brooklyn (FG #2) felt that without this strategy, one could not progress past more difficult passages: “I thought separating the music would help. And so, just repeating…repeating. Because if you don’t focus on the more difficult parts, you’re not going to get that much better.”

**Other strategies.** In order to practice challenges within their assigned music, the student participants incorporated some of the other strategies within the Classcraft quests and from their own learning experiences. The band director acknowledged that much of the students’ practice habits and the choices of practicing strategies came from the specific instruction they had received throughout the school year. Some of these strategies were also featured within the Classcraft quests. These strategies included the use of pencils to correct errors, the writing in and counting out of rhythms for harder music, and the breaking up rehearsed sections of concert music and études into manageable sections (chunking). Additionally, Kyle, (FG #1) spoke upon practicing in general with the assistant of an online application called Flat.io that provided pitch and rhythm models for the student to use:

I usually break it into pieces as well. But we also had a website called Flat.io that we could use. And for some parts that we really didn’t know really clap or play, I could look it up and type the rhythm and notes into the sheet thing. And then I play it for me so I know how it goes and how I should play it.
Alex (FG #1) did the same thing with another computerized application: “I also use the programs similar to Flat.io, but it’s called Musescore. It’s an app that I have on my computer. And so yeah, I do the same thing with that.”

Students’ and Teacher’s Attitudes and Perceptions of the Digital Gamification Process

The third research question was "What are the students' and teacher's attitudes and perceptions of the digital gamification process?" Data sources used to examine this research question included data (a) from Classcraft that indicated the length of time students were involved in digital gameplay, (b) gathered in the digital gamification section of the questionnaire, (c) derived from the focus groups, and (d) produced during the interview with the band director. For this section, I will first report the quantitative data gathered by the MPDGQ. Then, I will report on the emergent themes derived from the qualitative data.

Questionnaire Results

In the MPDGQ pre-test, 63% of the participating students (n = 10) in the study indicated that they played video games. Interestingly, that number decreased in the posttest questionnaire to nine students (56%). A gaming factor was created by multiplying the number of days per week participants reported they played video games by the amount of time they estimated they spent playing video games on those days. The questionnaire item related to time spent gaming per day yielded ordinal data ranging from ‘1’ – less than 30 minutes to ‘7’ – over 90 minutes. So, for example, if a participant indicated he played video games 5 days a week for 30 minutes each time, his practice time variable was calculated as ‘10’ (5 days multiplied by 2 – 30 minutes). To analyze if there was any change in the time gamer participants spent playing video games between the pre- and post-test, a Wilcoxon signed-rank test was calculated. No significant difference was found (Z = -1.18, p = .24, r = -.27) between the pre- (n = 10, M =15.2, SD = 14.5) and posttest (n = 9, M = 19.1, SD = 11.2) gaming factor scores.
Attitudes and perceptions of digital gamification. Items 41 to 50 of the questionnaire collected data on the participants’ beliefs about video game use and the possible use of digital games to learn (see Appendix G). Using a 5-point Likert-type scale (1 = Completely Disagree, 2 = Disagree, 3 = Not Sure, 4 = Agree, 5 = Completely Agree), participants rated each questionnaire item. The ratings for the 10 questionnaire items were summed to create an overall gaming perception score. A maximum score of 50 was possible. A Wilcoxon signed-rank test was calculated to determine if there was any significant difference. No significant difference was found ($Z = -1.83, p = .071, r = .42$) between the pre- ($M=38.5, SD = 4.95$) and post-test ($M = 41.3, SD = 4.36$) scores.

After analyzing the overall gaming perception scores, descriptive statistics were calculated for the pre- and posttest scores for each gaming item on the questionnaire (see Table 4-8). In the pretest, participants reported that they enjoyed playing video games ($M = 4.40, SD = .84$) and all had a general understanding of how video games operated ($M = 4.30, SD = .82$) and could figure out how a new video game could work ($M = 4.30, SD = .82$). Additionally, the respondents reported a neutral opinion in learning something useful from a video game ($M = 3.40, SD = .42$) and believing that they could learn something from a video game or video-game-like process ($M = 3.56, SD = .53$). A Wilcoxon signed-rank test was calculated to determine if there was a significant difference between the pre- and post-test means of the 10 questionnaire items related to digital gaming. A significant difference was found among the pre- ($M =3.40, SD = .52$) and posttest ($M = 4.33, SD = .50$) means for the item “I believe I can learn something useful from playing a video game” ($Z = -2.53, p = .01, r = -.58$) (see Table 4-9).
Table 4-9. Beliefs about Digital Gamification.

<table>
<thead>
<tr>
<th>Items</th>
<th>Pre-Test</th>
<th>Post-Test</th>
<th>Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>I enjoy playing video games.</td>
<td>4.40</td>
<td>4.67</td>
<td>-1.00</td>
<td>.32</td>
</tr>
<tr>
<td>If I were to start a new game, I could probably figure out the</td>
<td>4.30</td>
<td>4.22</td>
<td>-1.41</td>
<td>.16</td>
</tr>
<tr>
<td>controls quickly.</td>
<td></td>
<td>.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Because of my prior video game play experience, I generally</td>
<td>4.30</td>
<td>4.11</td>
<td>-1.73</td>
<td>.08</td>
</tr>
<tr>
<td>understand how all video games basically work.</td>
<td>.82</td>
<td>.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I prefer multiplayer video games to single player video games.</td>
<td>3.80</td>
<td>3.89</td>
<td>-1.00</td>
<td>.32</td>
</tr>
<tr>
<td>I find the idea of learning from a video game to be interesting</td>
<td>3.80</td>
<td>4.33</td>
<td>-1.63</td>
<td>.10</td>
</tr>
<tr>
<td>I'm interested in learning new information from playing a video</td>
<td>3.80</td>
<td>3.89</td>
<td>- .58</td>
<td>.56</td>
</tr>
<tr>
<td>game.</td>
<td>.79</td>
<td>.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I think I can learn something from a video game or a video game</td>
<td>3.80</td>
<td>4.11</td>
<td>-1.73</td>
<td>.08</td>
</tr>
<tr>
<td>like process.</td>
<td>.42</td>
<td>.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Based on my previous knowledge, I feel prepared to learn how to</td>
<td>3.70</td>
<td>4.11</td>
<td>-.71</td>
<td>.48</td>
</tr>
<tr>
<td>play a new video game.</td>
<td>1.16</td>
<td>.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe that I can learn better practicing skills from playing a</td>
<td>3.56</td>
<td>3.67</td>
<td>-.45</td>
<td>.66</td>
</tr>
<tr>
<td>video game or through a video game process.</td>
<td>.53</td>
<td>.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*I believe I can learn something useful from a video game.</td>
<td>3.40</td>
<td>4.33</td>
<td>-2.53</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>.52</td>
<td>.50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Questions used a five-point Likert type scale: 1=Completely Disagree, 2=Disagree, 3=Not Sure, 4=Agree, 5=Completely Agree

Analytics and Fidelity of Implementation

At the end of the Classcraft practice quest: Elysia Practoria, I observed 18 active avatars in play at several different experience levels within Classcraft’s gaming analytics (see Table 4-10). The participants appeared to be moderately engaged in the quests, gameplay, and the modifications they were allowed to do to their respective avatars. The most significant boost of experienced and possible engagement seemed to take place around the time of the third practice chart submission, which also paralleled a boss battle assessment. The members of Team Brass were able to further customize their avatars with the extra experience points and gold pieces after
winning a boss battle that challenged their knowledge of the practice strategies. Another point of engagement was observed when some students who did not turn in their practice charts received damage to their health points and had friends who had Healer avatars help them recover health through the use of action points. Finally, some students made use of the inbox feature found within Classcraft and were able to clarify game rules through correspondence with me directly.

Table 4-10. Number of Student Players at a Certain Experience Level at the end of the Classcraft Quests.

<table>
<thead>
<tr>
<th>Experience Level</th>
<th>Number of Players</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td>2</td>
</tr>
<tr>
<td>18</td>
<td>1</td>
</tr>
<tr>
<td>30</td>
<td>1</td>
</tr>
<tr>
<td>35</td>
<td>1</td>
</tr>
</tbody>
</table>

To ensure that participants had engaged in gameplay, I used some of the Classcraft analytics at the end of the quests to establish fidelity of implementation (see Table 4-11). Using the randomized number of each student participant, I categorized the present quantifiable data from each students’ dashboard that best fit the description of points and achievement/badges by Hamari et al. (2014). Those elements included the student avatars’ experience level, experience points (XP), gold pieces (GP), the number of in-game power spells, and the number of power points used to earn those spells. Participant 9 appeared to be the least involved student with their avatar having an experience level at 7 (6400 XP) with only 531 gold pieces, one spell, and six power points. In contrast, I observed participant 10 to be the top player in the class with a level 35 avatar (34900 XP), 6181 gold pieces, and 34 power points despite having just one power spell. All the results consisted of the outcome of practice chart submissions, randomized events, and a boss battle within the quests.
Table 4-11. Gamification Elements through Analytics from the End of the Classcraft Quests.

<table>
<thead>
<tr>
<th>Participant Number</th>
<th>Experience Level</th>
<th>Experience Points</th>
<th>Gold Pieces</th>
<th>Number of Powers</th>
<th>Power Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
<td>7900</td>
<td>631</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>14</td>
<td>13900</td>
<td>1173</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>3</td>
<td>30</td>
<td>29900</td>
<td>370</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>18</td>
<td>17900</td>
<td>49</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>17</td>
<td>16900</td>
<td>2181</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>6</td>
<td>14</td>
<td>13400</td>
<td>391</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>6900</td>
<td>541</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>7900</td>
<td>46</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>7</td>
<td>6400</td>
<td>531</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>10</td>
<td>35</td>
<td>34900</td>
<td>6181</td>
<td>1</td>
<td>34</td>
</tr>
<tr>
<td>11</td>
<td>10</td>
<td>9400</td>
<td>581</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>12</td>
<td>17</td>
<td>16200</td>
<td>960</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
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<td>1</td>
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<td>14</td>
<td>8</td>
<td>7900</td>
<td>541</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>15</td>
<td>15</td>
<td>14400</td>
<td>1801</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>16</td>
<td>7</td>
<td>6900</td>
<td>531</td>
<td>1</td>
<td>6</td>
</tr>
</tbody>
</table>

Mean: 14.3 14043.75 1133.06 3 9.44
SD: 8.17 8205.52 1478.02 3.18 8.140

Learning Through Video Games

Both focus groups and the band director had similar beliefs about learning through video games that centered around the (a) organization of practice experiences prior to a performance or assignments, (b) learning of new strategies and skills to practice music, and (c) general idea of using a video game to learn musical concepts. Alex, in focus group #1, believed that games like Classcraft might help students learn to be more organized with their practicing around a concert performance: “And yeah, it definitely helped me a lot around the concert time.” Additionally, Blake (FG #1) mentioned that playing through the quests and being guided by the use the goal-based practice charts made the students “…more prepared. Cause we had to do our charts and it helped us practice for the concert.”

Focus group #2, the group with the higher leveled avatars, was observed to be most vocal about how video games could help students practice and learn new skills. Taylor (FG #2)
acknowledged that there was a learning curve to understanding how to use Classcraft that all three participants in the group expressed to have encountered, yet were able to overcome after a time: “But something that I disliked was it was kind of hard to, for me, to learn it in the beginning. It was harder for me to pick up in the beginning. But, once I had it, it was easier to use.” Once the instructions were explained, the possibilities of learning through video games came into full view with focus group #2. Taylor (FG #2) explained that it could be a gateway for further understanding of the music being rehearsed in class:

Some of the benefits I saw were that it (the Classcraft project) really helped me…it can help people practice. It helps them understand what they need to work on and gives them good goals and strategies. To help them practice hard parts in their piece of music or anything that they’re working on.

Focus group #2 also acknowledged the general appeal of a video game assisting students in practicing their music. Parker (FG #2) stated the preceding sentiment concisely: “If people like video games more, people would want to do it more if it’s a video game. It just helps them.” Taylor (FG #2) also mentioned that the idea of video games being a study aid for practicing or learning other things: “I think that you should be able to use video games if they can actually help people. I think that they could be an essential part of helping people study.” The band director was impressed with the customization and specificity of the Classcraft game design, application to practice assignments, and appreciative of the overall attractiveness of the game:

Kids like games. They like electronics. They like all that stuff. I think the face appeal of the program is good. I think that sometimes when you gamify things, things in music, it looks a gamified version from like 1994. You know? And I think this is looks hip. I think it looks like some of the things they are probably doing on their own.

The band director believed that if there had been more time to explore and become comfortable with the game, the students may have gained more from the implementation of gameplay with instruction. The band director also recognized the value of using games like
Classcraft and the use of point systems instead of motivators like candy to get students to practice. This meant using points, leveling up, and students customizing their avatars as they progressed through the game: "Those kinds of things were something that they were like 'Yeah, that's fun! Oh yeah, I'll do this so I can…'. And those are the kind of things that's like 'OK, good.'"

Additionally, the band director also enjoyed the use of the boss battle to assess student knowledge and acknowledged the potential of learning through boss battles if they were designed effectively. Specifically, she enjoyed the possibilities of making those assessments about anything: “So, it can be about the practice technique things, but it also could be about the actual, technical, “what are you practicing?” It could be about all those kinds of things.” The band director also wished that those activities were used a bit more frequently within the design of the game.

**Dangers of Use**

Some members of both focus groups and the band director expressed concerns with the use and overuse of video games within their music learning experiences, mentioning (a) a general disinterest in video games, (b) difficulties encountered when learning gameplay, (c) possible effects on grading, and (d) potential hindrances to learning experiences in the band class as undesirable factors. Initially, Kyle (FG #1) demonstrated a general disinterest in the game: “I feel like for me personally, I wouldn’t keep up with the game and I’d always forget about it. So, the (goal-based practice) chart is the only thing I really would kind of keep up with because it was more of an information memory.” Alex (FG #1) also felt that the game was generally hard to keep up with; he would simply forget to record his progress on the goal-based practice charts, instead following previous practicing regimens: “I’ve already established a method of how I do things with band. For me, it was harder to remember to do the practice charts and to keep up with
Additionally, Alex was concerned that if video games and goal-based practice charts were the primary means of assessment, some students’ grades might suffer due to their disinterest:

If it were a punishment-based system, your grades would be affected if you didn’t practice. Then if somebody like me that already has an established method for practicing and doesn’t really use a practice chart because we’re not used to it. They could get a bad grade in band because they weren’t used to that.

Kyle (FG #2) was against the use of the video games in band class, indicating that if the educational component of a video game was not designed effectively, then it would be more of a hindrance to the music learning experience in their band class. He believed that there should be a complete separation of the two activities:

I feel like I probably wouldn’t use video games in band because band is band and you don’t usually use technology and its usually use paper sheet music. So, I feel like…not online things kind of helps and you don’t have to go online, and you actually just use paper or pencil or pen.

Alex (FG #1) also felt that band was more of a traditional scholastic class and that some students may find ways to cheat the process involved in goal-based practice charts:

Something that could happen is that you have kids that just write down that they did stuff on the practice sheet or just put random checks where they think that they did it. Or they’re like, “oh, I totally did that,” even though they didn’t. And then they’re…I guess it would have, like the opposite effect because they’re like, ‘oh, well, now I have a way out of practicing and proof that I did it,’ without having to actually practice.

Focus group #2 also had some reservations with the overuse of video games in a band class setting. Taylor (FG #2) expressed the group’s collective concerns that video games could become a distraction to the actual learning process:

Don’t overuse them or make sure that they aren’t too much of a video game. I think that it could be distracting to some kids. Like, if there’s parts of it that they could be distracted by, it might not help them study as much. Or they might not learn as much from the video game.
The preceding sentiment was echoed by Parker (FG #2), who believed that students may perceive the game or gaming-process as entertainment rather than education: “People play (video games) for fun and not for practicing, yes…it won’t really help them; they want to use it for that purpose only. They’re probably not practicing.” However, Brooklyn’s (FG #2) feelings centered around establishing a balance when using video games in the band room: “I think that if they (students) use it in moderation, they (video games) can help.”

Concerning the use of video games in a band classroom, the band director’s beliefs paralleled much of what her students stated in the focus groups. Based on her experiences as a teacher and mother, the band director believed that video games, like YouTube and other such technologies, should be used with a sense of moderation and should not stifle the process of learning and creating music. “I also think that we have to be really careful. And I think that music is something where the kids get to do something and create something and be a part of something that I don’t think you need technology to enhance.” The preceding response was especially relevant to the band director’s thoughts about the students’ use and overuse of their Chromebooks at a one-to-one school: “These kids have been in front of their Chromebooks all day long…let’s put the Chromebooks away and do something different.”

However, the band director was positive toward the use of Classcraft at the end of the project. This belief was related in part to Classcraft, as well as other video games of this nature, being part of a teacher’s proverbial toolbox: “But as a teacher, the more, I think the more tools you have in your toolkit, the better you can reach kids.” The band director also approved the use of Classcraft and similar video games as a plausible tool for a band director that can be customized to guide student practice: “So this, I think, could be really great for a teacher who wants to have some structure in their (students’) practice.”
Summary of the Results

The purpose of this study was to explore the potential of using digital gamification to motivate and develop middle school band students’ understanding of musical practice. The quantitative and qualitative data collected during this case study were analyzed to address the following three research questions:

1. Does digital gamification affect band students’ motivation to practice?
2. Can digital gamification be used to teach students how to practice effectively?
3. What are the students’ and teacher’s attitudes and perceptions of the digital gamification process?

Analysis of the quantitative data revealed no significant differences between participants’ pre- and post-test practice time or overall motivation. Significant decreases in two questionnaire items related to motivation to practice were uncovered: (a) “I enjoy when I improve some of my weak points,” and (b) “I would feel bad if I was not taking time to practice.” Findings from the qualitative data seemed to indicate that participants understood the importance and need for practice, and that it was important to their musical development on their instrument. Some of the participants felt that the activities of the study helped to promote more frequent and consistent practice and provided them with new strategies to use when practicing. The band director believed that students end-of-the-year scale tests were better, which she attributed, at least partially, to Classcraft tutorials and goal-based practice charts. The time period of the study (5 weeks) may not have been sufficient for all participants to become accustomed to the new ideas and approaches that were at the heart of the study (i.e., new practice strategies introduced through Classcraft and the use of goal-based practice charts).

Further analysis of the quantitative data revealed no significant differences between participants’ pre- and post-test perceptions of research-based practice strategies. Significant
differences concerning the application of practice strategies in different scenarios were found: (a) practicing with one’s hands only (no sound) as a strategy when working on longer, more difficult pieces of music and (b) starting a piece of music over and trying the song again until the notes are right as a way to avoid repeating mistakes when practicing. Findings from the qualitative data seemed to indicate that participants and band director observed the effectiveness of using practice charts in the project as it helped with practice organization and the learning and use of practice strategies. Additionally, the process of goal setting was also seen as beneficial to individual practice. When reporting the use of practice strategies, chunking, or the breaking down of music into smaller sections, appeared to be the most effective practice strategy among the participants. Some of the participants also reported the strategies of using a pencil to mark errors and the writing out and clapping of harder rhythms as effective ways to practice music.

Finally, analysis of the quantitative data revealed no significant differences between participants’ pre- and post-test video game play time or overall perceptions of digital gamification. A significant difference was found for one of the individual questionnaire items related to gaming perceptions: “I believe I can learn something useful from playing a video game.” Findings from the qualitative data seemed to imply that the student participants and the band director believed that there was a danger in the: (a) the overuse of digital games for instruction and (b) the notion that using digital games may not be a music practice motivator for students or if inadequately used, may be seen as just a game to other students. However, both the band director and her students appeared to agree that if proper elements in instruction, such as the appropriate use of in-game assessments and providing specific instructions, are incorporated into a digital game’s design that students genuinely enjoy playing, digital games may have a place in music instruction as a relevant teaching tool.
CHAPTER 5
DISCUSSION

Productive and regular student musical practice has been an ongoing concern of many music educators. The use of deliberate practice, which includes goal-setting, feedback, and the opportunity for repetition and correction of errors (Lehman, Sloboda, and Woody, 2002), has been identified as a process that, when utilized appropriately, can result in improved student performance. However, teaching students how to practice in this manner, and motivating them to do so, remains a challenge for many music teachers. In this study, the use of digital gamification to teach students about effective musical practice, and motivate them to regularly utilize those practice strategies, was studied. In this chapter I will summarize and interpret the results identified in chapter 4, providing possible implications for teaching practice and further research.

The discussion will focus on the research questions:

1. Does digital gamification affect band students’ motivation to practice?
2. Can digital gamification be used to teach students how to practice effectively?
3. What are the students’ and teacher’s attitudes and perceptions of the digital gamification process?

Digital Gamification and Motivation to Practice

Practice Time

The overall time that students spent practicing did not appear to change over the course of the study. There was no significant difference found between the pre- ($M = 17.3$, $SD = 10.4$) and post-test ($M = 15.1$, $SD = 7.34$) practice time factor scores. Students were typically practicing about two days per week, and around 60 minutes on those days throughout the study period. However, participants in both focus groups indicated that they knew practicing was important and that their motivation to practice was often driven by a desire to improve their (a) general playing abilities, and (b) sections of their music that presented technical challenges. Prior
to the study, the teacher encouraged her students to practice, and many were already regularly practicing. As this study occurred near the end of the school year, it may be that students’ practice habits were already established and this 5-week program did not allow enough time to significantly affect the practice schedule to which students had become accustomed. In addition, the amount of time spent practicing is undoubtedly related to the degree of motivation to practice experienced by students. This will be further discussed below.

**Motivation to Practice**

The overall motivation for students to practice did not appear to change over the time of the study. There was no significant difference found between the pre- ($M = 38.40, SD = 8.10$) and post-test ($M = 39.3, SD = 7.20$) practice motivation scores. This finding may have been due to some students having previously developed mindsets related to practice (Dweck, 2008) that were not able to be changed during this 5-week program. Furthermore, as this study began the students were on the verge of completing their last graded assignments in the class. Achieving rewards in the Classcraft game may not have motivated some students to practice as much as upcoming playing tests did. Thus, having to learn new approaches to practice in a limited amount of time may have been seen as something not worth the effort; a characteristic of attribution theory found in prior research (Picone, 2012; Schatt, 2011; West, 2013). The band director corroborated this observation, noting that learning a new way to practice was not every students’ priority at the end of the school year.

The descriptive statistics for the pre- and post-test scores of each motivation item indicated that the participants seemed collectively motivated and unmotivated by different scenarios. The most agreed upon motivational finding concerned the item (a) “I enjoy when I improve some of my weak points” ($M = 4.27, SD = .80$). This result seemed to align with both focus group participants’ beliefs that the Classcraft and the goal-based practice chart process
increased their desire to engage in practice and improve their musical skills. The focus group members’ beliefs also echoed sentiments of prioritizing practice to increase skill found in past research (Austin & Berg, 2006; Perez, 2011). Blake (FG #1) alluded to this in discussing the preparation of music pieces for the band's end-of-year performance, stating "It (the Classcraft tutorial and goal-based practice charts) helped me prepare for the concert. We had a lot of pieces to practice, and I could tell it (the music) was getting better. And I could play it (the concert music) faster."

The relatively high rating for the item, “I practice because I feel really good about myself when I get better at challenging skills” ($M = 3.81$, $SD = .91$) corresponds to both focus groups’ statements indicating they felt a sense of accomplishment after improving musical skills and challenging musical passages by completing the assigned practicing tasks (Latham & Seijts, 2016; Meece, Blumenfeld, & Hoyle, 1988; Perez, 2011). Both focus groups and the band director indicated how using the practice strategies found within the Classcraft unit helped students to successfully meet individual musical challenges.

Throughout the study, students who appeared to be fully engaged in the use of the goal-based practice charts, in tandem with the Classcraft units, were noted to check off each goal after the completion of a practice task for each day of practice. In return, their in-game avatars were provided with additional Experience Points (XP) and Gold Pieces (GP), with these rewards providing them advantages during gameplay. The students in focus group #2 indicated this experience was a strong point in the Classcraft unit’s design. From the notes recorded in my field journal, the participants' initial motivation to practice so that they would receive benefits within Classcraft appeared to be high. The participating students seemed to enjoy developing their respective avatars after being awarded XP (experience points-units that allowed players to "level
up," or strengthen, the in-game characteristics of their avatars) and GP (virtual gold pieces-units that allowed players to "buy" accessories within the game to customize their avatars). These extrinsic rewards may have contributed to some of the students’ motivation to practice. Previous researchers have also found that successfully meeting challenges may positively affect the motivation of music students (Miksza, 2012; Radocy & Boyle, 2012; West 2013).

Finally, the mean rating of the item “I enjoy when I learn new musical skills that I have never tried before” ($M = 3.81$, $SD = .75$) was supported by focus group #2’s sense of open-mindedness, with students describing how the activities they were engaged in during the study helped their motivation to practice by (a) learning new practice strategies and (b) encouraging more practice sessions to use those new strategies. While learning a new way of practicing did not appear to be every students’ priority at the end of the school year, the process of goal setting alongside learning new practice strategies, facilitated through the use of a goal-based practice chart and Classcraft tutorials, appeared to be beneficial to a number of students.

A comparison of the pre- and post-test means of the 12 individual motivational questionnaire items identified two significant differences. First, a significant ($Z = -2.33$, $p = .02$, $r = -.41$) decrease was found between the pre- ($M = 4.27$, $SD = .80$) and post-test ($M = 3.88$, $SD = .89$) ratings of the item, “I enjoy when I improve some of my weak points.” This item was the highest rated motivational factor, and the quantitative results seemed to parallel the qualitative data that suggested many students may have been experiencing practice fatigue at the end of the school year. This decrease might have been due to few tangible musical goals (e.g., playing tests and performances) and the end of the school year coming to a close, resulting in little motivation to improve musical deficiencies. However, it should be noted, that both pre- and post-test scores were close to a rating of “4,” which was labeled as “agree” in the rating scale. While the decrease
was statistically significant, it may not have been a truly meaningful difference. The number of practice charts turned in for experience points throughout the project was inconsistent, and only 9 to 10 of the students regularly engaged in video gameplay from the start. Students in both focus groups also indicated that they were aware of potential negative factors related to using digital games to learn about and motivate practice. Their concerns included the difficulties of learning gameplay, the possible effects upon the grading policies in band, and possible hinderances to learning experiences in band. Students in focus group #1 also described how they, at times, experienced intrinsic motivation to practice, so for them the use of a digital game as an extrinsic motivator may not have been especially helpful.

A significant increase \((Z = -2.12, p = .03, r = -.36)\) was found between the pre- \((M = 3.06, SD = 1.12)\) and post-test \((M = 3.44, SD = .81)\) means of “I would feel bad if I was not taking time to practice.” During the course of the study, the students were preparing for the final concert of the school year and the band director stressed the importance of practicing and knowing their parts for the concert. The participants in both focus groups stated that they felt a sense of responsibility to practice prior to performances. The students’ desired to sound good and perform well on individual and group levels. Therefore, the students may have taken their individual practice time more seriously if they would have had additional upcoming performances.

During the study, the participating students practiced for their final scale tests. At the end of the Classcraft unit, the band director observed that there had been a marked improvement among the students’ end-of-year scale test results when compared to students in previous years. She credited this to the activities used within the Classcraft unit. The band director indicated the establishment of practice goals that designated specific items to practice via the goal-based practice charts appeared to be beneficial. The band director and I collaborated to ensure that
performance goals related to both the concert music and scales that would be assessed were integrated into the Classcraft unit and goal-based practice charts. Assigning the students to practice the scales on the goal-based practice charts and submit the charts for in-game rewards through Classcraft may have improved the scale test results, motivating the students to practice. The lack of significant quantitative findings in this area may be related to the small sample of students.

Using Digital Gamification to Teach Students How to Practice Effectively

Knowledge and Application of Research-Based Practice Strategies

The participants’ overall understanding and use of the research-based practice strategies did not appear to change throughout the study. There was no significant difference found between the pre- \( (M = 32.9, SD = 6.39) \) and post-test \( (M = 39.3, SD = 7.20) \) practice knowledge scores. This finding may be because some of the strategies featured within the Classcraft unit were already part of the students' practice strategy repertoire. The band director acknowledged that the students had been provided instruction related to musical practice throughout the school year, and that the Classcraft unit featured some of these strategies within the quests. These strategies included the use of pencils to correct errors, writing in and counting out rhythms, and breaking up sections of concert music and études into manageable sections (chunking) when practicing. Thus, the students already had a background in the use of a number of practice strategies, and even if they added one or two new ideas as a result of the Classcraft materials, it was not enough of a change to affect the quantitative data.

The descriptive statistics for each of the individual practice knowledge scores (see Table 4-3) suggested that the students may have depended more on some practice strategies than others. While there was no significant difference found between the pre- and post-test ratings of each practice strategy, participating students seemed to collectively agree that the item, “I
believe marking the music with a pencil during practice is okay” ($M=4.38$, $SD = .96$), was their most trusted strategy for effective practicing. The practice of using a pencil to correct and prevent practicing errors was also observed during the students’ in-class rehearsals. The students’ overall familiarity and frequent use of this strategy is likely what it received the highest rating of any strategy. Likewise, the students also agreed that “When practicing, I repeat a measure or section of a song until it is right” ($M=4.25$, $SD = .85$) and “I believe in breaking the song into smaller sections (or chunks) and then practicing those smaller sections” ($M=4.06$, $SD = .85$) were valuable strategies to use when practicing.

While the participating students were fairly neutral in their rating of the item “I believe I should plan my practice sessions using a practice chart” ($M = 2.94$, $SD = .93$), the qualitative results seemed to support the use of goal-based practice charts as a useful practicing tool, a tool that paired well with the Classcraft practice quests. The students in focus group #2 felt that using the goal-based practice charts, and implementing the practice strategies learned through Classcraft gameplay, helped them achieve their practicing goals. Specifically, Parker (FG #2) seemed to feel that the organization of tasks within the goal-based practice charts' design was beneficial: “It (goal-based practice chart) told me each day I needed to practice and not to skip it. Then I have independence, because I know I need to practice more to get better on a song if I’m having difficulty with it.” Both the focus group students and the band director seemed to acknowledge the value of establishing clear, achievable practice goals, and connecting those goals to the use of corresponding music practicing strategies (Anguiano, 2006; Drayton, 2013; Kolthammer, 2009; Perez, 2011). Barry and Hallam (2002) concluded that the organization of short practice sessions over long periods of time is effective in helping student musicians improve their performance ability. Likewise, helping students to develop achievable goals,
providing them with consistent supervision and feedback, and a giving them some autonomy in the process, may help students be able to engage in *deliberate practice* (Barry & Hallam, 2002; Miksza, 2015; West, 2013).

The mean rating for the item “I believe I should set goals for each practice session” ($M = 3.19$, $SD = 1.11$) received a neutral rating by the students. However, the band director appreciated how the goal-based practice chart process of listing specific practice goals and strategies for students could be developed in a way that also incorporated the students’ personal practice goals. In addition, the ability to set and reward independent, goal-based practice within the Classcraft game design was an element of the project that she seemed to value. These findings align with previous research and pedagogical writings on using digital games to achieve music learning and growth (Banfield & Wilkerson, 2014; Criswell, 2009; Gredler, 2003; Harve et al., 2018; Little, 2003; Mazzo, 2015; McAlister, 2013; Sierra, 2013).

Unfortunately, the student participants were inconsistent in reporting the practice strategies they used on their goal-based practice chart submissions throughout the study. From the submissions, only two strategies (clapping and counting and chunking) of the five featured practice strategies, were reported by the students on the goal-based practice charts (see Table 4-2). The clapping and counting strategy, more evident within the in-class rehearsals from classroom observations, was the most mentioned strategy, with five students recording this strategy on their submitted practice charts. However, some of these strategies may have already been part of the students’ practice habits and they simply did not record their use. Furthermore, the number of goal-based practice chart submissions was too small to identify any other changes in the use of the practice strategies.
A comparison of the pre- and post-means of five practice strategies within four different scenarios (see Table 4-4) identified two significant differences. In this part of the questionnaire, participants were asked to rank each strategy from most effective (1) to the least effective (5).

First, a significant \((Z = -2.23, p = .03, r = -.41)\) decrease was found between the pre- \((M = 2.36, SD = .84)\) and post-test \((M = 2.33, SD = .98)\) means of strategy “Practicing with one’s hands only (no sound)” when working on longer, more difficult pieces of music. While this practice strategy was not one of the featured strategies in the Classcraft unit, I did observe students engaging in this strategy when I observed them during rehearsals. The band director often instructed students to quietly play over their parts with their fingers on their instruments while singling out corrections for an individual player or section. While the decrease was statistically significant, it may not have been truly meaningful; the ratings only varied by .03 and the standard deviation didn’t fluctuate to a large extent either.

A significant \((Z = -3.05, p = .00, r = -.57)\) decrease was also found between the pre- \((M = 3.86, SD = .36)\) and post-test \((M = 3.67, SD = .82)\) means of the strategy “start over and try the song again until the notes are right” as a way to avoid repeating mistakes when practicing. The magnitude of this decrease was not large, as the item’s pre- and post-test means varied by only a small amount (.19). However, it may be related to the students’ growing understanding that simply starting at the beginning of a piece of music and repeating it over and over is not the most effective practice strategy. Perhaps the students had begun to understand other practice approaches they could use more effectively than this particular one. It should be noted that I observed that this practice strategy was also discouraged by the band director during rehearsals.
Students’ and Teacher’s Attitudes and Perceptions of the Digital Gamification Process

Gaming Time

The overall time that students who identified themselves as gamers spent gaming did not appear to change over the course of this study as there was no significant difference found between the pre- ($n = 10, \bar{M} = 15.2, SD = 14.5$) and post-test ($n = 9, \bar{M} = 19.1, SD = 11.2$) game time factor scores. It is interesting that one less student identified themself as a gamer during the post-test data collection. Students appeared to play digital games, both off- and on-line, about four days a week for a little over an hour per day during the study period. As only about half of the band class identified themselves as gamers in the questionnaire, this finding may support the beliefs from both focus group #1 (the non-gamer focus group) and the band director that some students are not interested in playing digital games, let alone be motivated to practice music because of them.

Attitudes and Perceptions of Digital Gamification

The identified gamers’ overall attitudes and perceptions of playing digital games did not appear to change over the time of the study. While an increase was noted, there was no significant difference found between the pre- ($\bar{M} = 38.5, SD = 4.95$) and post-test ($\bar{M} = 41.3, SD = 4.36$) score means on attitudes towards digital gamification. Even though the statistical results indicated no difference for this variable, there were still 18 active Classcraft avatars at the end of the unit (see Table 4-7). Although 16 students officially participated in the study, almost all of the 21 students in the band class participated in the gaming experience. The total number of players involved at the end of the game does demonstrate the band students’ willingness to engage in the activity.

The descriptive statistics for the pre- and post-test scores of each gaming perception item indicated that the participants’ feelings towards playing digital games either held steady or, in
some cases slightly grew throughout the study. Responding on a Likert-type scale ranging from ‘1-completely disagree’ to ‘5-completely agree’, the self-identified gamers seemed to agree with two items in this section of the questionnaire (see Table 4-8): “I enjoy playing video games” \( (M = 4.40, SD = .84) \), and “Because of my prior video gameplay experience, I generally understand how all video games basically work” \( (M = 4.30, SD = .82) \). In the distribution of the MPDGQ, this section was only available to students who indicated that they played video games. Therefore, these findings are possibly due to the fact that the students already seemed to have had an established background in digital games before the study.

However, the participants seemed to be more neutral towards the use of digital games for learning music. The quantitative results for the item "I believe that I can learn better practicing skills from playing video games or through a video game-like process" \( (M = 3.56, SD = .53) \) indicated that the participants may have felt unsure about using digital games for their music education. Both the band director and the students expressed reservations about using digital games to teach music. Within the focus groups’ discussions and during the band director interview, one emergent concern was that the use of digital games in a band class setting might become a distraction. If students perceived a digital game or process as recreational instead of part of a meaningful learning experience, they may less likely to take it seriously. Similar concerns were found in a past study (Blumberg, Almonte, Barkhordari, & Leno, 2014).

Concerning the use of video games in a band classroom, the band director’s beliefs paralleled much of what her students stated in the focus groups. The band director believed that video games and other digital platforms such as YouTube, FaceBook, and other similar media, should be used in moderation to help ensure that they do not stifle the process of learning and creating music:
I also think that we (educators) have to be really careful. And I think that music is something where the kids get to do something and create something and be a part of something that I don’t think you need technology to enhance.

The preceding sentiment was especially relevant to the band director’s thoughts about the students’ use and overuse of their Chromebooks at a one-to-one school: “These kids have been in front of their Chromebooks all day long…let’s put the Chromebooks away and do something different.” Students may also be spending time playing (music) video games and using mobile applications outside of school, which seemed to cause the band director to feel that they didn’t need to do more of this during school.

Authors (e.g., Bauer, 2014) have discussed that for technology to be used effectively by music teachers, schools need to provide more than just the technology itself. Teachers also need to be asked to consider the content that can be effectively taught with the technology, the affordances and constraints of the technology, and be provided with professional development to learn about pedagogical strategies that can be used to facilitate the use of technology in varied educational contexts (Bauer, 2014; Mishra & Koehler, 2006). Without the development of this type of understanding, the use of technology with students is likely to be hit-or-miss, at best. Mishra and Koehler (2006) described this type of teacher knowledge as Technological Pedagogical and Content Knowledge (TPACK). The level of the band director’s TPACK at the time of this study, or of the teachers in this school in general, is unclear.

A comparison of the pre- and post-test means of the ten individual gaming perception questionnaire items identified what may be one of the most important findings in the study. A significant increase ($Z = -2.53$, $p = .01$, $r = -.58$) was found between the pre- ($M = 3.40$, $SD = .52$) and post-test ($M = 4.33$, $SD = .50$) ratings of the item “I believe I can learn something useful from a video game.” The item increased .93 points from pre- to post-test. These quantitative findings were supported by the responses from the focus groups and the band
director. I observed that there seemed to be a general interest in using digital gamification for music learning from both the students and band director if (a) explicit directions towards gameplay were explained and (b) if a game's design was relevant and conducive towards learning for the student. Both the band director and focus group #2 (consisted of the top gamers of the project), stated that if created appropriately, digital games may be able to help an individual learn. In Taylor’s (FG#2) case, digitally gamified experiences like Classcraft could assist in students’ music learning processes: “They (digital games) help people practice or learn the parts that they need to learn.” These findings align with previous research on the promotion of effective learning through digital games (Anderson, 2008; Baek & Whitton, 2013; Dicheva, Dichev, Agre, & Angelova, 2014; Whitton, 2014).

Students in Focus Group #1 pointed out that if students are not active video game players or are unable to easily learn how to play a game, this might interfere with their ability to learn through digital gaming. Parker (FG #2) believed that more explicit directions and students who could demonstrate gameplay to others could improve this concern: “I think I would demonstrate it for the people who need help. If people got it, I would just leave them alone. But, if people needed help, they should just call me.” The band director also felt that explicit instruction related to a video game is essential in order for students to effectively learn, including the learning of music practice strategies and approaches.

Students within the focus groups suggested that the design of a digital game-based learning should include a rewards system that provided users with additional chances to gain points to earn rewards. They indicated that digital games needed to have rewards, be engaging, and be relevant to them or else they would not play them. This may be a cause for concern, akin to the more controversial element of pointsification discussed by some critics of digital
gamification and digital game-based learning. In pointsification, the motivation received by game players is strictly conceived in terms of points, leaderboards, and rewards (Bogost, 2011; Kapp, 2012; Robertson, 2010). It is debatable whether this type of motivation is the most suitable for sustaining for student learning. Thus, relevant digital gaming experiences embedded with goal-setting and tiered sequential learning processes such as use in this study may be more beneficial to student learning.

**Limitations of the Study**

While the students participating in the study represented a diverse subpopulation of the host school’s community, they are not representative of all middle school students in the state or across states. In addition, many schools in the same county have students who come from a wider range of socio-economic circumstances. Some other schools in this area are unable to financially support a one-to-one technology policy like exists in the school where this study took place. Finally, the number of participating students, while sufficient to complete this project, was relatively small, reducing the amount of data available for analysis. All of these factors make it impossible to generalize the results of this study to other populations. However, certain aspects of the study may be transferable to similar instructional situations and environments.

In further exploring the quantitative data collected in the study, I chose to examine individual questionnaire items after not finding overall significant changes in the participants’ motivation to practice, knowledge of practice strategies, or attitudes and perceptions regarding the digital gamification process over the course of the study. In doing so, it should be noted that the results could be susceptible to Type 1 error, a “false positive” that may occur when a null hypothesis is rejected when it is actually true. Therefore, the reader should use caution in interpreting those particular findings.
In addition to this, the timeline for the study was arranged to fit within the school’s schedule and band program’s availability to participate. This necessitated conducting the study within five weeks at the end of the school year. This arrangement may not have allowed for sufficient time for the true impact of the gamification of music practice to be fully studied. In addition, due to other factors such as the timing of the band’s performances, the impact of the study treatments may have been compromised. It is unclear how these issues may have impacted student motivation. The study should be replicated over a longer period of time, accounting for other extraneous variables such as concert performances that might confound the results.

**Pedagogical Implications and Suggestions for Future Research**

The findings from this study have possible implications for the teaching practice of music educators and future research. First, while it was found that many students were not exclusively motivated to use digital games or processes to practice, it appeared some students did find the Classcraft unit helpful and enjoyable. School classes are made up of many different types of students who have varied motivational and learning needs. Teachers need to differentiate instruction in order to meet the needs of all students. The digital gamification utilized in this study seemed to benefit some students, and there was no evidence it caused any harm to either motivation or learning more about effective ways to practice; a finding that can supported by past studies on the positive effects of digital game-based learning on motivation (Anderson, 2008; Criswell 2009; Feola, 2010; Hungate, 2016; McAlister, 2013; Reyher, 2014). Therefore, it seems as though digital game-based instructional approaches are another tool that teachers should consider for use with certain students, in certain situations.

Second, while some students and the band director questioned the efficacy of learning and use of practice strategies with the use of digital games, others seemed to embrace the possibilities of learning new ways of practicing through the digitally gamified process; a finding
identified in previous studies (Archbell, 2009; Bethea, 2008; Haris & Sugito, 2015; Hoffman, 2009). Importantly, and while recognizing that the results are based on a small sample size and could be susceptible to Type 1 error, a significant increase was found between the pre- and post-test ratings of the item “I believe I can learn something useful from a video game.” It may be that with more time, students and the teacher would have become more comfortable with this new approach to learning in a band class. It may also be that the teachers and students weren’t entirely comfortable with using this type of technology in a music performance classroom, a situation that might be addressed through the development of the teacher’s TPACK. Music teachers should not shy away from trying new approaches to music teaching and learning just because they made not immediately have a positive reception. Often people avoid change, and sometimes change can be beneficial, with persistence needed to work through the new ways of doing things.

Finally, the results of the study identified practice strategies and habits that were deemed effective by adolescent students and their band director. These strategies included those featured in the Classcraft unit, those emergent in individualized practice habits demonstrated by students, and in past research (Austin & Berg, 2006, Drayton, 2013; Hallam, 2001; Kolthammer, 2009; Miksza, 2007; Oare, 2007; Schatt, 2013). While the small sampling of the quantitative data and the focus groups do not represent the vast population of present-day middle school band students, the information related to the practice strategies students indicated as being helpful when practicing could be useful to some middle school band directors to share with their students. While musical practice is still a personal endeavor for every student, band directors may provide students with strategies that seemed to work for similar-aged student musicians to encourage successful and more frequent practice sessions.
Future researchers could build on the results of this study in a number of additional ways. A replication of this study would allow comparisons to be made, exploring the nature of any similarities or difference that were found. Also, using a larger sample of participants could allow alternative forms of analysis to be conducted, and slightly different research questions to be examined. Conducting studies with participants from varied settings (e.g., beginning band, high school band, choirs, orchestras, etc.) might provide information about how use of a platform like Crasscraft needs to vary according to type of class. Comparing various groups of participants (e.g., gamers to non-gamers) could also yield interesting insights. As this area of research is largely unexplored in music education, there are numerous possible studies that could be designed and conducted to examine the role and effect of gamification in music teaching and learning.

Conclusions

Overall, the results of this study were mixed. Quantitative analysis resulted in no significant findings related to students’ overall motivation to practice and the efficacy of using digital gamification to teach students practice strategies. However, examination of qualitative data, and results from the quantitative analysis of specific questionnaire items, indicated there may be benefits in some areas, for certain students. In addition, the majority of participants had positive attitudes and perceptions of the digital gamification process, and participants demonstrated a significant increase in their perceptions of being able to learn something useful from a video game.

The results may have been impacted by a treatment period that was of insufficient length, a result of having to conduct the study at a time that fit within the overall schedule of the school and activities of the band program. Due to the nature of the study’s design, the findings are not generalizable, however aspects of them may be transferable to other specific educational
contexts. Despite this, the digital gamification utilized in this study seemed to be beneficial to some students. Technologies and pedagogies associated with digital gamification should continue to be explored in applied and research settings as music educators seek ways in which to enrich the lives of students through varied forms of musical engagement.
1. Background:

Researchers have studied musical practice and the development of effective practice strategies for adolescent band students (Drayton, 2013; Kolthammer, 2009; Oare, 2007; Schatt, 2011). Several of these studies have focused on activities and approaches that addressed students’ needs for motivation, self-regulation, reflection, and a sense of achievement, all of which are necessary for quality practice (Bauer, 2008; Miksza et al., 2018). A primary finding of previous research is an approach grounded in goal theory can help to facilitate student motivation and self-efficacy toward practice.

Discussion of the role of motivation in achievement is also found in research that has examined the gamification of learning. Gamification is the inclusion of elements in the teaching/learning process that are commonly part of gameplay, such as badges, merits, progress bars, and other game-like experiences (Al-Alaymoun, 2014; Gee, 2007; Hamari, Koivisto, & Sarsa, 2014). The utilization of gamification principles has been found to contribute to the development of critical thinking and social skills among students and makes the acquisition of knowledge fun through engagement and promotion of a sense of accomplishment (Banfield & Wilkerson, 2014; Huang, 2013). Other scholars have discussed the benefits of digital gamification in music education, describing how it may enhance the instruction of musical concepts (Criswell, 2009; Gower & McDowall, 2012; Richardson & Kim, 2011). However, there is much to be learned in regard to the gamification of the wide variety of music learning experiences in which students engage.
2. Specific Aims:

The purpose of this study is to explore the potential of digital gamification on middle school band students’ musical practice. The research questions are as follows:

1. How does digital gamification impact band student's motivation to practice?
2. How can digital gamification be used to teach students practice strategies?
3. What are the students’ and teachers' attitudes and perceptions of the digital gamification process?

3. Research Plan / Study Description:

Upon the approval of the University of Florida Institutional Review Board (IRB), I will first ask the band director of the selected school to participate in the study. I will also request permission from the school’s principal to conduct the study. After receiving informed consent from the band director, I will distribute an invitation form to the principal of the school, informed consent forms to the parents and/or guardians of the middle school band students, and the students will be asked to complete an assent form. Those students who do not provide consent will still have the opportunity to participate in the activities of the study, but their data will not be used in the analysis or reporting. There will be no more than minimal risk to the participants, and they will have the opportunity to leave the study at any time. The study will strive to have 30 participating students (N = 30).

After receiving and confirming consent and assent, I will administer the researcher-developed Musical Practice and Digital Gamification Questionnaire (MPDGQ) to ascertain demographics and participants’ perceptions of motivation, musical practice, and gamification. The questionnaire will be completed by the students on their Chromebooks at school under my guidance. Following this, each of the participating students will be provided access to an account on Classcraft (2013). Additionally, each student will be placed in one of two teams for the duration of the Classcraft unit. This will be done by separating the class in two by way of instrument families. One team will be a combination of brass and percussions students while the other team will consist of the woodwind students.

I will then introduce the Classcraft web-platform to the students via a computer and overhead projection system and prompt an introductory "quest" for the students to engage in per the directions of the unit plan. Some of the tasks for the tutorial quest will include assigning and designing avatars and acclimating students to the online platform. From there, the student participants will experience tutorial quests based on the topics of deliberate practice, practice strategies, the use of the goal-based practice chart, the development of practice goals by the students, and the joining of teacher and student-developed practice goals.

The activities the participants will experience within Classcraft will include completing objectives and goals concerning practicing introduced within a band class and supplemented by way of the web platform. Within the goal-based practice quests, the band director will inform what goals will be achieved through the submissions of the charts and either reward or penalize the students’ respective avatars with the corresponding effects of their practice.
session quest. The effects of such consequences on their avatars will prompt students to diagnose their practice habits to keep their characters strong and full of power and skills. Additionally, the band director will prompt random events within the game that will have different effects on all the participating students’ avatars. As the band director conducts lessons in class, the practice goals provided by goal-based practice charts will be given and assessed through traditional means as well as through quests via Classcraft for five weeks.

Through the use of their Chromebooks or mobile devices and the Classcraft mobile application or website platform, students will use the quests to assist in achieving the goals set by the practice charts. Throughout the week, the students will submit both their practice assignments through the school’s learning management system and a Google Form practice chart for each day they practice. After a week of instruction, I will reference the Google Form practice chart submissions with the band director’s practice assignment submissions to determine how students should be rewarded. The outcomes from the submissions in favor of the students will result in the distributing of experience points (XP), health points (HP), action points (AP), or gold pieces (GP) to their Classcraft avatars. Conversely, the student’s avatar will run the risk of losing those attributes from a poor submission. The point system also doubles as Classcraft’s analytic system and graphs out the progress of growth for the students’ respective avatars.

Two assessment activities will be created through Classcraft and reflect the use of an in-class performance assessment of the practice goals. Through the Classcraft platform, students will be asked about how to practice specific musical tasks that are similar to the goals on the practice chart. This will be done through two in-game boss battles within the five-week span. Soon after, I will administer the post-test questionnaire. Afterwards, the randomly selected participating students will be recorded again and have their sessions assessed with a practice chart. Finally, focus groups with selected student participants and an interview with the teacher will be conducted to collect relevant data via respective protocols. The full scope of the study will take eight weeks.

For data analysis, a convergent parallel mixed-methods design within a case study will be used to collect both quantitative and qualitative data. The analysis of the data will take place concurrently in this study. The Musical Practice and Digital Gamification Questionnaire (MPDGQ) administered before and after the Classcraft unit will present the participants of the study with items within the themes of motivation, practice strategies, and perceptions of learning through digital games. The learning of practice strategies by the student participants will be assessed via a goal-based practice chart and by the use of a rubric found within the quest for evidence of the strategies learned from the Classcraft quests and to self-regulate their practice sessions. Further assessments will happen by way of two in-class quizzes. The final aspect of the data analysis will consist of the transcription, coding, and organization of patterns found within the field notes, student focus groups, and a band director interview. As with the nature of the study, special attention will be given to the major themes of motivation, knowledge of practice strategies, and perceptions towards digitally gamifying practice habits.

To gather data on how digital gamification can affect band students’ motivation to practice, the MPDGQ’s second section will inquire student participants on factors and habits that contribute to their motivation toward practicing through Likert-type scales. In the same fashion, the MPDGQ’s third and fourth sections will also address participating students’ knowledge and present use of researched effective practice strategies and current beliefs on learning through digital games and digital game-based processes. The descriptive statistical data (mean, mode, range, standard deviation, and variance) from each of the items of the
questionnaires will be calculated and a repeated measures ANOVA will be conducted to compare pre- and post-test data.

To understand how digital gamification may be used to teach students how to practice effectively, a combination of observational field note journaling by both the band director and myself and three interview sessions will be used to gather relevant data. The responses to the protocol from the student focus groups and band director interview will be analyzed by way of pattern matching and categorization (Yin, 2017). The theoretical lenses that the patterns will be focused around motivation, knowledge of practice strategies, and perceptions of learning through a digital gamification process. The observations from the field notes in addition to the responses to specific prompts from the focus groups with selected student participants and an interview with the band director will be cross-referenced and interpreted for patterns within the data and for emergent themes.

4. Possible Discomforts and Risks:

- Much of the probability of harm to the study's participants will entail much of their everyday experiences. The participating students will also have the opportunity to leave the study at any time.

5. Possible Benefits:

The benefits of the study would possibly include:

- The benefit of progressing teaching methodologies
- The students will benefit from new learning strategies
- The study will benefit P.K. Yonge by providing information/resources that improve teaching and learning efforts.

6. Conflict of Interest:

- There are no real or potential conflicts of interest that the investigator foresees within the project.
Greetings!

My name is John M. Peasant, Jr. and I am a doctoral candidate in music education conducting research for my dissertation at the University of Florida. I am interested in the application of digitized game-based principles to music teaching and learning. To that end, I would like to have you participate in a study about the use of game-based technologies to teach students how to practice their instrument and motivate them to do so. Would you be willing to join me in this investigation?

If you are willing to assist with this project, please reply as soon as possible to me via email or phone.

Thank you for your consideration.

Sincerely,

John M. Peasant, Jr.
Dear Principal XXXXXXX,

I am writing to you to ask for permission to conduct a dissertation research study with the middle school band students at XXXXXX School. I am a doctoral candidate in the University of Florida’s School of Music and formerly was a middle school band and secondary general music teacher in Jacksonville, FL. The title of my dissertation is An Exploration of Digital Gamification on Middle School Band Students’ Practice Habits. If granted permission, the study will include an online questionnaire distributed to the middle school band students to learn about their motivation to practice, understanding of practice strategies, and perceptions of video games and gamification processes and the use of a digitally gamified process to teach students effective practice strategies. The study will also include the use of two student focus groups and an interview with the band director.

The study will be conducted using Classcraft, an online platform in which the students will engage in self-paced instructional quests to learn about research-based, musical practice strategies. Classcraft is FERPA and COPPA compliant; if needed, additional information can be obtained within the platform’s privacy policy.

All band students’ parents/guardians will receive (a) a detailed letter, distributed by the band director, which describes the study in full and (b) an informed consent form to sign and return. I will visit the participating band class to explain the study and provide students with assent forms. While all students will be able to participate in the digitally gamified process, full participation and data will only involve students who have submitted their parent/guardian consent forms and their assent forms. All individually identifiable data will be kept confidential and participation or non-participation will not affect students’ grades or status in band in any way.

I have attached the consent and assent forms. I have also included the links to the questionnaire and the sequence of events of the study. If you would like, I am willing to meet with you to explain the project in further detail in person. You may also contact me at (706) 244-2364 or asualto123@ufl.edu. If you are willing to grant permission for this study, please draft a letter stating that you have read a description of the study and are willing to grant consent for the study to take place in your school this semester. This letter is a requirement of the University of Florida’s Institutional Review Board in order for me to proceed with the study in your school district. This letter may be given to XXXXXXX upon completion. Thank you for your time and consideration.

Sincerely,

John M. Peasant, Jr., The University of Florida

Encl: Parent letter, Teacher consent form, Student assent form
APPENDIX D
INFORMED CONSENT FOR INSTRUCTOR

Protocol Title: An Exploration of Digital Gamification on Middle School Band Students’ Practice Habits

Please read this consent document carefully before you decide to participate in this study.

Purpose of the research study: The purpose of this study is to explore the potential of digital gamification on middle school band students’ musical practice.

What you will be asked to do in the study:

1. Provide time for the researcher to introduce Classcraft and the study, and to administer the pre-test.
2. Encourage students to complete the quest-based tutorials within Classcraft and return the goal-based practice charts each week.
3. Collaborate with the researcher to assign “points” within Classcraft, awarded to students when they successfully complete challenges associated with quests.
4. Provide time for the researcher to administer the post-test.
5. Provide time for the researcher to meet with two small groups of students to discuss the project with them, following its conclusion.
6. Talk with the researcher about your perceptions of the project following its conclusion.

Time required: This study is projected to take six weeks. It is planned to be a supplement to your instruction and will not obscure the scope and sequence of your class.

Risks and Benefits: There are no known risks to participating in the study. The benefits of the study may include that the participating students will become stronger musicians by improving their abilities to practice. Additionally, the data collected may have significance for future educational practice, research, and policy.

Compensation: There is no compensation for participating in this study.

Confidentiality: Your identity will be kept confidential to the extent provided by law. The final results will be presented in a paper to fulfill a course requirement and might be sent to research journals for publication or used in research conference presentations. You will be given a pseudonym and no identifying information (e.g., your school) will be included in any written report or public presentation of the study.

Voluntary participation: Your participation in this study is completely voluntary. There is no penalty for not participating.

Right to withdraw from the study: You have the right to withdraw from the study at any time without consequence. You do not have to answer any questions you do not want to answer.

Whom to contact if you have questions about the study:
John M. Peasant, Jr., 101 Music Building, The University of Florida School of Music, Gainesville, FL 32611; ph (706) 244-2364;
Supervisor: Dr. William Bauer, 121 Music Building, The University of Florida School of Music, Gainesville, FL 32611; ph (352) 273-3182

Whom to contact about your rights as a research participant in the study:
UFIRB Office, Box 112250, University of Florida, Gainesville, FL 32611-2250; ph (352) 392-0433.

I have read the procedure outlined above. I voluntarily agree to participate in this study and have received a copy of this description.

___________________________________________________________________
Participant’s signature and date

___________________________________________________________________
Principle investigator’s signature and date
Dear Parent or Guardian,

My name is John M. Peasant, Jr. and I am a doctoral candidate in music education at the University of Florida, working on my dissertation research. With your consent, I would like to have your child’s help in studying how a digital game-based software program may encourage them to practice more effectively. The software to be used is called Classcraft <https://www.classcraft.com>, an online, platform that will your child will use to participate in an adventure game designed to help them learn strategies to improve their ability to effectively practice their instrument.

Prior to beginning the study, students will be asked to respond to a brief online questionnaire to ascertain their background knowledge and perceptions about approaches to musical practice and digital games. Then, over a period of six-weeks students will engage in instructional quests via the Classcraft online platform, turning in a goal-based practice chart of assigned exercises at the end of the week. At the conclusion of the six-weeks of Classcraft activities, another online questionnaire, similar to the one administered initially, will be completed. Finally, a few students will be selected to participate in focus groups that will discuss their perceptions of the process.

The hope is that the Classcraft quests will be informational and motivational to the students, resulting in them being more knowledgeable and confident about practicing their instrument. There are no known risks to participating. Additionally, the possible benefits of the study may include that your student will become a stronger musician by improving their ability to practice.

Your child’s participation is entirely voluntary, and he/she may choose to not take part in the study at any time and without penalty. The results of this study may be used in several forms (publications, presentations, etc.), but participants identities will never be revealed in any form. All data will be destroyed at the conclusion of the study and no names will be stored in the data.

Should you have any questions, please contact Dr. William Bauer at wbauer@arts.ufl.edu or me at asualto123@ufl.edu. Thank you for allowing your child to participate in this research. Please sign the consent form if you are willing to let your child participate and return it to the band director by DATE.

Sincerely,

John Peasant, Jr.

I voluntarily agree to give my consent for (please print)

____________________________________________ to participate in the study.

Signature______________________________________

Date_________________________________________

Relationship to participant______________________
Dear Student,

My name is John M. Peasant, Jr. and I am a doctoral candidate in music education at the University of Florida, working on my dissertation research. With your consent, I would like to have your help in studying how an online website called Classcraft can be used to help you to practice more effectively.

Prior to beginning the study, you will be asked to complete a brief online questionnaire to learn what you think about musical practice and digital games. Then, over a period of six-weeks you and your classmates will participate in online adventure games designed to help you learn more about practicing. Each week you will turn in a unique practice chart that includes the opportunity for you to decide what and how to practice. Once we’ve finished the online quests, another questionnaire, similar to the one you did at the start of this study, will be completed. Finally, a few students will be selected to participate in small groups to discuss everything we’ve done.

The hope is that through your participation you will become more knowledgeable and confident about practicing your instrument. There are no known risks to participating. Additionally, the possible benefits of the study may include that you will become a stronger musician by improving your ability to practice.

Your participation is entirely voluntary, and you may choose to not take part in the study at any time, without penalty. The results of this study may be used in several forms (publications, presentations, etc.), but participants identities will never be revealed in any form. All data will be destroyed at the conclusion of the study and no names will be stored in the data.

Thank you for considering participating in the study. Please sign the form below if you are willing to participate and return it to the band director by DATE.

Sincerely,

John Peasant, Jr.

I (please print) _____________________________________ voluntarily agree to participate in this study.

Signature_______________________________________________

Date_______________
### APPENDIX G
### TABLE OF SPECIFICATIONS

<table>
<thead>
<tr>
<th>Questionnaire Items</th>
<th>Research Question</th>
<th>Practice Attribute</th>
<th>Literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>I practice because I enjoy discovering new musical skills</td>
<td>RQ1</td>
<td>Motivation</td>
<td>Schatt, 2013</td>
</tr>
<tr>
<td>I practice because I know that practicing my instrument allows me to be well thought of by people that I know</td>
<td>RQ1</td>
<td>Motivation</td>
<td>Schatt, 2013</td>
</tr>
<tr>
<td>I practice because I believe that practicing my instrument is one of the best ways to meet people</td>
<td>RQ1</td>
<td>Motivation</td>
<td>Schatt, 2013</td>
</tr>
<tr>
<td>I practice because I feel really good about myself when I get better at challenging skills.</td>
<td>RQ1</td>
<td>Motivation</td>
<td>Schatt, 2013</td>
</tr>
<tr>
<td>I believe that practicing my instrument is one of the best ways I have chosen to develop other parts of myself.</td>
<td>RQ1</td>
<td>Motivation</td>
<td>Schatt, 2013</td>
</tr>
<tr>
<td>I enjoy when I improve some of my weak points</td>
<td>RQ1</td>
<td>Motivation</td>
<td>Schatt, 2013</td>
</tr>
<tr>
<td>I feel excited when I am really involved in practicing</td>
<td>RQ1</td>
<td>Motivation</td>
<td>Schatt, 2013</td>
</tr>
<tr>
<td>I must practice to feel good about myself that I like</td>
<td>RQ1</td>
<td>Motivation</td>
<td>Schatt, 2013</td>
</tr>
<tr>
<td>I would feel bad if I was not taking time to practice</td>
<td>RQ1</td>
<td>Motivation</td>
<td>Schatt, 2013</td>
</tr>
<tr>
<td>I practice to show others how good I am at music</td>
<td>RQ1</td>
<td>Motivation</td>
<td>Schatt, 2013</td>
</tr>
<tr>
<td>I enjoy when I learn new musical skills that I have never tried before</td>
<td>RQ1</td>
<td>Motivation</td>
<td>Schatt, 2013</td>
</tr>
<tr>
<td>I believe marking the music with a pencil during practice is okay.</td>
<td>RQ2</td>
<td>Practice Strategy</td>
<td>Koltshammer, 2009</td>
</tr>
<tr>
<td>I believe I should plan my practice sessions using a practice chart.</td>
<td>RQ2</td>
<td>Goal-Setting</td>
<td>Koltshammer, 2009</td>
</tr>
<tr>
<td>I believe I should set goals for each practice session.</td>
<td>RQ2</td>
<td>Goal-Setting</td>
<td>Koltshammer, 2009</td>
</tr>
<tr>
<td>I believe in breaking the song into smaller sections (or chunks) and then practicing those smaller sections.</td>
<td>RQ2</td>
<td>Practice Strategy</td>
<td>Koltshammer, 2009</td>
</tr>
<tr>
<td>When practicing, I repeat a measure or section of a song until it is right.</td>
<td>RQ2</td>
<td>Practice Strategy</td>
<td>Koltshammer, 2009</td>
</tr>
</tbody>
</table>
When practicing, I play a measure or section of a song slowly.  
I count and clap rhythms when practicing  
I sing through my part when practicing  
I silently look at my music, thinking about and hearing my part in my head.

If I’m practicing a song and I’m having trouble with the rhythms of the last few measures, what would be the best strategy to use?  
If I’m practicing a song and I’m having problems with a fast section with a lot of notes, what would be the best strategy to use?  
If I’m having trouble practicing a longer, more difficult piece of music, what would be the better strategy to use?  
To make sure I don’t make the same mistake again in the music I practice, what would be the best strategy to use?

<table>
<thead>
<tr>
<th>Questionnaire Items</th>
<th>Research Question</th>
<th>Literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>I enjoy playing video games.</td>
<td>RQ3</td>
<td>Wood, 2011</td>
</tr>
<tr>
<td>I prefer multiplayer video games to single player video games.</td>
<td>RQ3</td>
<td>Wood, 2011</td>
</tr>
<tr>
<td>I’m interested in learning new information from playing a video game.</td>
<td>RQ3</td>
<td>Adams, 2017</td>
</tr>
<tr>
<td>I find the idea of learning from a video game to be interesting.</td>
<td>RQ3</td>
<td>Adams, 2017</td>
</tr>
<tr>
<td>I believe I can learn something useful from a video game.</td>
<td>RQ3</td>
<td>Adams, 2017</td>
</tr>
<tr>
<td>I think I can learn something from a video game or a video game-like process.</td>
<td>RQ3</td>
<td>Adams, 2017</td>
</tr>
<tr>
<td>I believe that I can learn better practicing skills from playing video games or through a video game-like process.</td>
<td>RQ3</td>
<td>Adams, 2017</td>
</tr>
<tr>
<td>Based on my previous video game knowledge, I feel prepared to learn how to play a new video game.</td>
<td>RQ3</td>
<td>Adams, 2017</td>
</tr>
<tr>
<td>Because of my prior video gameplay experience, I generally understand how video games all basically work.</td>
<td>RQ3</td>
<td>Adams, 2017</td>
</tr>
<tr>
<td>If I were to start a new video game, I could probably figure out the controls quickly.</td>
<td>RQ3</td>
<td>Adams, 2017</td>
</tr>
</tbody>
</table>
APPENDIX H
THE MUSICAL PRACTICE AND DIGITAL GAMIFICATION QUESTIONNAIRE (MPDGQ)

There are no right answers, so please give your most honest response!

Section I

Please provide your Identification Number. If you are unsure what it is, please ask Mr. Peasant.

What is your age?

What is your gender?

• Male
• Female
• Prefer not to say

What is your race? Indicate what race you consider yourself to be. Check all that apply.

• White
• African American
• Hispanic
• Native American
• Chinese
• Japanese
• Korean
• Other Asian
• Mixed

What instrument do you play in band?

Do you play any other band instruments?

In what grade did you begin playing your band instrument?

How many days per week do you usually practice?
On days you practice, about how many minutes do you usually spend practicing?
1-90 minutes

Do you take private lessons?

- Yes
- No

If so, how long have you taken private lessons?

Section II

Please select the number that matches how much you agree or disagree with each of the following statements.

<table>
<thead>
<tr>
<th>Completely Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Completely Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

I practice because I enjoy discovering new musical skills 1 2 3 4 5
I practice because I know that practicing my instrument allows me to be well thought of by people that I know 1 2 3 4 5
I practice because I believe that practicing my instrument is one of the best ways to meet people 1 2 3 4 5
I practice because I feel really good about myself when I get better at challenging skills. 1 2 3 4 5
I practice because I believe that practicing my instrument is one of the best ways I have chosen to develop other parts of myself. 1 2 3 4 5
I enjoy when I improve some of my weak points 1 2 3 4 5
I feel excited when I am really involved in practicing 1 2 3 4 5
I must practice to feel good about myself 1 2 3 4 5
I feel strong emotions when I make music that I like 1 2 3 4 5
I would feel bad if I was not taking time to practice 1 2 3 4 5
I practice to show others how good I am at music 1 2 3 4 5
I enjoy when I learn new musical skills that I have never tried before 1 2 3 4 5

Section III

Please select the number that matches how much you agree or disagree with each of the following statements.

<table>
<thead>
<tr>
<th>Completely Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Completely Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

135
I believe marking the music with a pencil during practice is okay.  
I believe I should plan my practice sessions using a practice chart.  
I believe students should set goals for each practice session.  
I believe in breaking the song into smaller sections (or chunks) and then practicing those smaller sections.  
When practicing, I repeat a measure or section of a song until it is right.  
When practicing, I play a measure or section of a song slowly.  
I count and clap rhythms when practicing  
I sing through my part when practicing  
I silently look at my music, thinking about and hearing my part in my head.  
I set short- and long-term goals for my practice sessions

For the following questions, please rank them from 1-5 with 1 being the most effective and 5 being the least effective.

If I’m practicing a song and I’m having trouble with the last few measures, what would be the best strategy to use?

___ Start over and try the song again until the rhythm is better.  
___ Write in the counting for the rhythm that is difficult.  
___ Clap and count the rhythm that is difficult.  
___ Repeat the rhythm over and over until it is fixed.  
___ Break the song up into pieces, focusing only on the part where the rhythm is difficult.

If I’m practicing a song and I’m having problems with a fast section with a lot of notes, what would be the best strategy to use?

___ Play the fast section slower.  
___ Break the fast section into smaller pieces.  
___ Practice the fingers/hands only, without making the instrument sound.  
___ Repeat the fast section over and over until the notes are right.  
___ Start over and try the song again until the notes are right.

If I’m having trouble practicing a longer, more difficult piece of music, what would be the best strategy to use?

___ Practice the fingers/hands only, without making the instrument sound.  
___ Play the music from start to finish over and over again until you get it right.  
___ Break or “chunk” the music into small sections and practice them, slowly adding the sections together.  
___ Move on to an easier piece of music.  
___ Make sure all the rhythms in the music are correct, but not worry about correct notes.
To make sure I don’t make the same mistake again in the music I practice, what would be the best strategy to use?

___ Take a pencil and mark the places that I made mistakes at in the music.
___ Start over and try the song again until the notes are right.
___ Look and think over the music, sing the part in my head, and then play it.
___ Practice the music using only my fingers.
___ Move on to an easier piece of music.

Section IV

Do you play video games?

- Yes
- No (goes to end of questionnaire)

How many days per week do you play video games?

_______

On days you play video games, about how many minutes do you usually spend playing?

_______

Do you play video games online?

- Yes
- No

Please select the number that matches how much you agree or disagree with each of the following statements.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

I enjoy playing video games.  1  2  3  4  5
I prefer multiplayer video games to single player video games.  1  2  3  4  5
I’m interested in learning new information from playing a video game.  1  2  3  4  5
I find the idea of learning from a video game to be interesting  1  2  3  4  5
I believe I can learn something useful from a video game.  1  2  3  4  5
I think I can learn something from a video game or a video game-like process.  1  2  3  4  5
I believe that I can learn better practicing skills from playing video games or through a video game-like process.  1  2  3  4  5
Based on my previous video game knowledge, I feel prepared to learn how to play a new video game.  1  2  3  4  5
Because of my prior video gameplay experience, I generally understand how video games all basically work.
If I were to start a new video game, I could probably figure out the controls quickly.

*Thank you so much for taking the time to complete this questionnaire. The information you’ve given me will be a great help.*
Appendix I
TABLE OF PLANNED LEARNING EXPERIENCES AND LESSON GUIDES

<table>
<thead>
<tr>
<th>Week of the Study</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>After receiving IRB approval.</td>
<td>Visit a band rehearsal and explain the study to the students; demonstrate the Classcraft platform. Distribute informed consent and student assent letters. Ask students to return these by (date).</td>
</tr>
<tr>
<td>1 (following receipt of informed consent and student assent forms)</td>
<td>Administer the pre-test version of the <em>Musical Practice and Digital Gamification Questionnaire</em>. The students will complete the questionnaire on their Chromebooks. The researcher will lead students through the Classcraft tutorial module on as they follow along on their Chromebooks.</td>
</tr>
<tr>
<td>1</td>
<td>Students will be assigned their first practice chart and Quest 1: Welcome to Elysia! The Valley of the Forgetful (Marking up the music) Students will experience a randomized event (The Riders of Vay) where an in-game prompt will positively or negatively affect each students’ avatars. This will happen each day they meet within the week. The band director is also allowed to administer in-game rewards or consequences at any time through Classcraft. Students will complete the assigned quest on their Chromebooks and the goals on the practice chart. Students will submit the Week 1 practice charts and receive appropriate awards for the completion of practice chart goals.</td>
</tr>
<tr>
<td>2</td>
<td>Students will be assigned the next week’s practice chart and Quest 2: Largos: The Land of Déjà vu (Slowing down the music) Students will experience a randomized event (The Riders of Vay) each day they meet within the week. The band director is also allowed to administer in-game rewards or consequences at any time through Classcraft. Students will complete the assigned quest on their Chromebooks and the goals on the practice chart.</td>
</tr>
<tr>
<td>3</td>
<td>Students will submit the Week 2 practice charts and receive appropriate awards for the completion of practice chart goals. Students will be assigned the next week’s practice chart and Quest 3: The Old Castle…Excelsior! (Chunking of the sections of music)</td>
</tr>
</tbody>
</table>
Students will experience a randomized event (The Riders of Vay) each day they meet within the week.

This week, the band director will prompt a mini-boss (assessment) within Classcraft that will test students’ knowledge of the practice strategies learned so far and their practical applications. The completion of this task will either affect the students’ avatars positively or negatively depending on their performance.

The band director is also allowed to administer in-game rewards or consequences at any time through Classcraft.

Students will complete the assigned quest on their Chromebooks and the goals on the practice chart.

4 Students will submit the Week 3 practice charts and receive appropriate awards for the completion of practice chart goals.

Assign Quest 4: Into the Quartz Caverns! (Thinking and singing the music)

Students will experience a randomized event (The Riders of Vay) each day they meet within the week.

The band director is also allowed to administer in-game rewards or consequences at any time through Classcraft.

Students will complete the assigned quest on their Chromebooks and the goals on the practice chart.

5 Students will submit the Week 4 practice charts and receive appropriate awards for the completion of practice chart goals.

Students will be assigned the next week’s practice chart and Quest 5: Ambrosia: The Final Fight! (Clapping and counting rhythms)

Students will experience a randomized event (The Riders of Vay) each day they meet within the week.

The band director is also allowed to administer in-game rewards or consequences at any time through Classcraft.

Students will complete the assigned quest on their Chromebooks and the goals on the practice chart.

6 Students will submit the Week 5 practice charts and receive appropriate awards for the completion of practice chart goals.
This week, the band director will prompt the final boss (assessment) within Classcraft that will test students’ knowledge of all the practice strategies learned in the unit and their practical applications. The completion of this task will either affect the students’ avatars positively or negatively depending on their performance. This will official end the game.

The researcher will administer the post-test version of the Musical Practice and Digital Gamification Questionnaire. The students will complete the questionnaire on their Chromebooks.

Conduct two student focus groups after the Classcraft unit.

Conduct an interview with the band director after the Classcraft unit.

Unit Title: Practicing through Classcraft!
Weekly Lesson Plan #1: The Deliberate Practice Quests: Welcome to Elysia!, Enter the Practice Chart, and Deliberate Practice Quest 1 – The Valley of the Forgetful
Designed by: J. Peasant, Jr.
Grade Level: 6th-8th Grade
Subject/Topic Areas: Music - M/J Band
Time Frame: 1 Week
Standards Addressed:
MU.68.S.2.2: Transfer performance techniques from familiar to unfamiliar pieces.
MU.68.S.3.1: Sing and play age-appropriate repertoire expressively.
MU.68.S.3.2: Demonstrate proper vocal or instrumental technique.
MU.68.S.3.6: Develop and demonstrate efficient rehearsal strategies to apply skills and techniques.
MU.68.H.2.2: Analyze how technology has changed the way music is created, performed, acquired, and experienced.

I. Objectives
   a. To increase band students’ awareness of the planning, monitoring, and assessment of individual practice through the Classcraft software.
   b. To introduce students to a goal-based practice chart to assist in the organizing of their practice sessions.
   c. To assess the students’ use of their practice charts.
   d. To introduce the practice strategy of marking down small notes in one's music to help reduce error in practice

II. Materials
   a. The lesson will use a goal-based practice chart that will be distributed to the class before the use of Classcraft. It will be used to help guide students’ practice sessions.
   b. The lesson will use excerpts of music at an appropriate performance level for middle school band students. The excerpts will be selected from a method book,
scanned, and uploaded onto the Classcraft platform or handed out in class. The excerpts will be suited for the practice strategy being utilized.

III. Preparation
   a. Mr. Peasant will introduce the Classcraft platform to the students through an instructional video and a brief demonstration of its gameplay by way of an in-class quest. He will inform students that the nature of the following quests will center around practice strategies that will help them practice better.
   b. Via their Chromebooks, Mr. Peasant will prompt the students to log on Classcraft and help them establish their in-game avatars.
   a. Mr. Peasant will then instruct the students to log out and log back on to Classcraft at home to take on the first quest. Specifically, he will acknowledge that the first quest they will encounter will involve them marking up their music and encountering a tool that will help them organize their practice sessions.

IV. Classcraft Tutorial
   a. At home, the student will log on Classcraft and continue with the tutorial quest.
   b. At the last part of the quest, the students will be prompted to practice and complete the practice chart portion of the night. They will also proceed with the quest entitled: Marking it Up!
   c. The student will encounter the task of taking their music that was passed out and complete the instructions provided by the Classcraft quest. This included taking a pencil and making appropriate marks for practicing the music that was passed out to them as well as the music being rehearsed in class.
   d. For each night of the week, the students will practice the portion of the practice chart for each night which will include the process of marking up their music. They will turn in their chart before the next assigned quest.

V. Summary
   a. Students will become acclimated with the use of the practice chart and will understand that it plays an important part in their quests.
Unit Title: Practicing through Classcraft!
Weekly Lesson Plan #2: Deliberate Practice Quest 2: Largos: The Land of Deja Vu
Designed by: J. Peasant, Jr.
Grade Level: 6th-8th Grade
Subject/Topic Areas: Music - M/J Band
Time Frame: 1 Week
Standards Addressed:
- **MU.68.S.2.2**: Transfer performance techniques from familiar to unfamiliar pieces.
- **MU.68.S.3.1**: Sing and/or play age-appropriate repertoire expressively.
- **MU.68.S.3.2**: Demonstrate proper vocal or instrumental technique.
- **MU.68.S.3.6**: Develop and demonstrate efficient rehearsal strategies to apply skills and techniques.
- **MU.68.H.2.2**: Analyze how technology has changed the way music is created, performed, acquired, and experienced.

I. Objectives
   a. To increase band students’ awareness of the planning, monitoring, and assessment of individual practice through the Classcraft software.
   b. To assess the students’ use of their practice charts.
   c. To introduce the practice strategy of slowing down segments scales and music to help reduce error in practicing and increase rhythmic accuracy.

II. Materials
   a. The lesson will use excerpts of music at an appropriate performance level for middle school band students. The excerpts will be selected from a method book, scanned, and uploaded onto the Classcraft platform. The excerpts will be suited for the practice strategy being utilized.

III. Preparation
   a. Mr. Peasant will ask about the progress of the first Classcraft quest. He will inform students that the nature of the following quests will center around practice strategies that will help them practice better. Specifically, he will acknowledge that the first quest will involve them practicing slowly and clapping out rhythms.
   b. Mr. Peasant will give the practice chart of the week.
   c. Mr. Peasant will then instruct the students to log on Classcraft at home to take on the next quest.

IV. Quest: Slowing it Down and Clapping Aloud
   a. At home, the student will log on Classcraft and proceed with the quest entitled: **Slowing it Down at the Shore!**
   b. The student will encounter the task of practicing an excerpt of rhythmic music uploaded on Classcraft. The students will rehearse the music with the strategy practicing their music slowly, gradually building speed. They will be informed that this strategy can be used to perform their music more accurately the first time and prevent future mistakes.
c. For each night of the week, the students will practice the portion of the practice chart for each night which will now include the use of marking up their music and slowing down/clap and count. They will turn in their chart before the next assigned quest.

V. Summary
   a. In the past classes, the band direct will ask the class about the first two practice strategies:
      i. Marking the music up
      ii. Slowing down speed/ clapping and counting out the rhythms.
Unit Title: Practicing through Classcraft!
Weekly Lesson Plan #3: Deliberate Practice Quest 3: The Old Castle…Excelsior!
Designed by: J. Peasant, Jr.
Grade Level: 6th-8th Grade
Subject/Topic Areas: Music: M/J Band
Time Frame: 1 Week
Standards Addressed:
MU.68.S.2.2: Transfer performance techniques from familiar to unfamiliar pieces.
MU.68.S.3.1: Sing and/or play age-appropriate repertoire expressively.
MU.68.S.3.2: Demonstrate proper vocal or instrumental technique.
MU.68.S.3.6: Develop and demonstrate efficient rehearsal strategies to apply skills and techniques.
MU.68.H.2.2: Analyze how technology has changed the way music is created, performed, acquired, and experienced.

I. Objectives
a. To increase band students’ awareness of the planning, monitoring, and assessment of individual practice through the Classcraft software.
b. To assess the students’ use of their practice charts.
c. To introduce the practice strategy of chunking up and repeating smaller sections of scales and assigned music to assist in the accuracy and familiarity of those sections.
d. To allow students to make autonomous decisions on what practice methods to use in their practicing.

II. Materials
a. The lesson will use excerpts of music at an appropriate performance level for middle school band students. The excerpts will be selected from a method book, scanned, and uploaded onto the Classcraft platform. The excerpts will be suited for the practice strategy being utilized.

III. Preparation
a. Mr. Peasant will ask about the progress of the first Classcraft quest. He will inform students that the nature of the following quests will center around practice strategies that will help them practice better. Specifically, he will acknowledge that the new quest will involve them “chunking” their music.
b. Mr. Peasant will give the practice chart of the week. The students will notice that there will be a section missing in their practice chart. Mr. Peasant will inform them that their next quest will inform them of what to do.
c. Mr. Peasant will then instruct the students to log on Classcraft at home to take on the next quest.

IV. Quest: Chunk it up…Over and Over Again; The Knights have Chosen their Weapon!
a. At home, the student will log on Classcraft and proceed with the quest entitled: Feeling Chunky…!
b. The student will encounter the task of practicing an excerpt of uploaded on Classcraft. The students will rehearse the music with the strategies of breaking down the music excerpt into smaller portions and repeating each section slowly until they do not make a mistake within five repetitions. If they make a mistake, they must start over at one. They will then be instructed that they may use this strategy to practice harder parts of any music the students may encounter.

c. Within this quest, the students will be informed that the next time they meet, they will be able to choose what practice strategy the class as a whole will use (The Paladins’ Choice!).

d. In the next class meeting, the band director will poll the class on which of the

e. The students will practice the portion of the practice chart for each night which will now include the use of the strategies of marking up their music, slowing down/clapping and counting, and chunking up. They will turn in their chart before the next assigned quest.

V. Summary

a. In the past classes, the band direct will ask the class about the first two practice strategies:

   i. Marking the music up.

   ii. Slowing down speed/ clapping and counting out the rhythms.

   iii. Chunking up smaller sections of music and practicing them through repetition.
Unit Title: Practicing through Classcraft!
Weekly Lesson Plan #4: Deliberate Practice Quest 4: Into the Quartz Caverns~
Designed by: J. Peasant, Jr.
Grade Level: 6th-8th Grade
Subject/Topic Areas: Music: M/J Band
Time Frame: 1 Week
Standards Addressed:
MU.68.S.2.2: Transfer performance techniques from familiar to unfamiliar pieces.
MU.68.S.3.1: Sing and/or play age-appropriate repertoire expressively.
MU.68.S.3.2: Demonstrate proper vocal or instrumental technique.
MU.68.S.3.6: Develop and demonstrate efficient rehearsal strategies to apply skills and techniques.
MU.68.H.2.2: Analyze how technology has changed the way music is created, performed, acquired, and experienced.

I. Objectives
   a. To increase band students’ awareness of the planning, monitoring, and assessment of individual practice through the Classcraft software.
   b. To assess the students’ use of their practice charts.
   c. To allow students to make autonomous decisions on what practice methods to use in their practicing.
   d. To introduce the practice strategy of thinking and singing out assigned music to assist developing sight-reading habits and familiarity of sections before playing them.
   e. To introduce an assessment tool for students to use for themselves as they practice as well as with others when conducting peer reviews of practice habits.

II. Materials
   a. The lesson will use excerpts of music at an appropriate performance level for middle school band students. The excerpts will be selected from a method book, scanned, and uploaded onto the Classcraft platform. The excerpts will be suited for the practice strategy being utilized.
   b. The students will be given a rubric to self-assess the quality of their practice sessions and assist in guiding others with nurturing proper practice habits.

III. Preparation
   a. Mr. Peasant will ask about the progress of the Classcraft quests. He will inform students that the nature of the following quests will center around practice strategies that will help them practice better. Specifically, he will acknowledge that the first quest will involve them marking up their music.
   b. Mr. Peasant will give each student a piece of excerpted music and their new practice chart of the week. The band director and her students will decide on the next practice strategy the class will use as a whole on their practice chart.
   c. Mr. Peasant will then instruct the students to log out and log back on to Classcraft at home to take on the next quest.

IV. Quest: Pause…and Think/Sing About It!; The Rune Rubric
a. At home, the student will log on Classcraft and proceed with the quest entitled: **The Chrono Quartz.**
b. The student will encounter the task of practicing an excerpt of uploaded on Classcraft. The students will rehearse the distributed music with the strategies of looking at the music before playing their instrument and thinking out the rhythm and melody. They will then be asked to sing out their part to themselves while “clicking” out their part before playing.
c. Within this quest, the students will be provided a rubric (**The Rune Rubric**) in which they can assess their practice habits as well as others. The quest will inform the students that the next time they meet, they will have the opportunity to do so.
d. In the next class meeting, the band director will provide time for students to fulfill the assigned rubric among each other as they practice in pairs/groups and assess each other. They will fulfill the rubric and turn it into The band director.
e. The students will practice the portion of the practice chart for each night which will now include the use of the strategies of marking up their music, slowing down/clapping and counting, chunking up, and pause/think/sing. They will turn in their chart before the next assigned quest.

V. Summary
a. In the past classes, the band direct will ask the class about the first two practice strategies:
   i. Marking the music up.
   ii. Slowing down speed/ clapping and counting out the rhythms.
   iii. Chunking up smaller sections of music and practicing them through repetition.
   iv. Pause, think and then sing their music.
Unit Title: Practicing through Classcraft!
Weekly Lesson Plan #5: Deliberate Practice Quest 5: Ambrosia: THE FINAL FIGHT!
Designed by: J. Peasant, Jr.
Grade Level: 6th-8th Grade
Subject/Topic Areas: Music: M/J Band
Time Frame: 1 Week
Standards Addressed:
MU.68.S.2.2: Transfer performance techniques from familiar to unfamiliar pieces.
MU.68.S.3.1: Sing and/or play age-appropriate repertoire expressively.
MU.68.S.3.2: Demonstrate proper vocal or instrumental technique.
MU.68.S.3.6: Develop and demonstrate efficient rehearsal strategies to apply skills and techniques.
MU.68.H.2.2: Analyze how technology has changed the way music is created, performed, acquired, and experienced.

I. Objectives
   a. To increase band students’ awareness of the planning, monitoring, and assessment of individual practice through the Classcraft software.
   b. To assess the students’ use of their practice charts
   c. To allow students to make autonomous decisions on what practice methods to use in their practicing.
   d. To introduce the practice strategy of identifying the beats in the measures of their music, counting them out, and then clapping out the rhythms at a slow pace to help reduce error in practicing and increase rhythmic accuracy.
   e. To assess the students’ knowledge of the practice strategies and the usefulness of both the practice chart and practicing rubric.

II. Materials
   a. The lesson will use excerpts of music at an appropriate performance level for middle school band students. The excerpts will be selected from a method book, scanned, and uploaded onto the Classcraft platform. The excerpts will be suited for the practice strategy being utilized.
   b. The students will use their Chromebooks or mobile devices to record themselves practicing. They will use their recordings for self-assessment and appropriate feedback from the band director and fellow peers.

III. Preparation
   d. Mr. Peasant will ask about the progress of the Classcraft quests. He will inform students that the nature of the last two quests will center around one more practice strategy that will help them practice better and will challenge their knowledge of the practice strategies themselves. Specifically, he will acknowledge that the last practice quest will involve the students recording themselves.
   e. Mr. Peasant will give each student their new practice chart of the week. The band director will allow her students to use any 2-3 of the practice strategies covered in the lesson to use for their practice charts.
f. Mr. Peasant will then instruct the students to log out and log back on to Classcraft at home to take on the next quest.

IV. Quest: Record it Down; the Final Fight
   a. At home, the student will log on Classcraft and proceed with the quest entitled: **Enter the Creature, Cinnami!**
   b. The student will encounter the task of identifying and writing out the numbers of the beats in their music and clapping out the rhythm slowly. After that process, they will practice their music.
   c. Within the week, the students will encounter an in-game assessment quiz (**The Final Fight**) where the students will be tested on their knowledge of the practice strategies as well as when and where a strategy could be most appropriate when practicing.
   d. For each night of the week, the students will practice the portion of the practice chart for each night which will now include the use of marking up their music. They will turn in their final chart for final power-up of their avatars.

V. Summary
   a. Before the summative interview with students and the band director, the class would have had the experience of learning research-based practice strategies through the Classcraft platform and using tools to regulate better and assess their practice habits.
Students,

It is now time to end the formal period of gathering data for my research. You have played an incredibly important role in this journey! Thank you for giving me the chance to expound upon my findings one more time through a culminating interview with you. Today, I’m going to ask you all to describe how you practiced with the use of Classcraft and I’m curious as to whether the guided practice sessions through the game have made any difference on your motivation towards practicing. So, I would like you to consider these same areas: your motivation towards practicing, your thoughts about the practice strategies learned, and learning through the use of digitalized gamification.

Could you please take a few moments to answer the following questions about your practice experiences through Classcraft? The more detailed you can be in your responses the better, especially if you can illustrate your answer with an incident or example. Please share what you can; everything is appreciated. Once again thank you for your time.

1. MOTIVATION:

Overall – Do you feel that you all are more motivated after the project?

How would you describe your attitudes toward practicing before the project and after it: positive or negative? Finds excuses to avoid it? Is it sometimes fun? A sense of responsibility in being prepared for a lesson or band rehearsal?

Do you all recognize the connection between effort and outcomes? Or attributes success or failure to other causes such as natural ability? Distractions? Other activities?

Do you all have independence in making decisions about practicing: when, where, for how long? Reminders?

2. PRACTICE STRATEGIES

Would you say that your practice structure is more organized and thought out after the project, or is it still random and scattered? Do you sense they now have more of a goal in mind, something specific they want to achieve? What practice methods do you feel worked better for you and which ones did not?

For the most part, do you feel that your all have gained a better sense of achievement of your practice goals after practicing with Classcraft? In addition to the evidence set by assessing practice charts and tests in the procedure, are you able to hear the growth or lack thereof within your playing abilities?

3: PERCEPTION OF DIGITAL GAMES IN THE BAND CLASSROOM
After using the Classcraft game in the band room:
What did you like/dislike about Classcraft?

If you were designing the game, what would you do differently?

Are you more for or against the use of video games or digitally gamified technologies within the band room or other music classrooms?

What benefits could you see from using such technologies?

What detriments can you also foresee with such uses of technology in the music classroom?

Any other comments…

Thank you all for your hard work and help in this project. Game on and have a great rest of the school year!
Dear the Band Director,

It is now time to end the formal period of gathering data for my research. You have played an incredibly important role in this journey! Thank you for giving me the chance to expound upon my findings one more time through a culminating interview with you. Last week, I gathered the musician participants and gave them a questionnaire asking them to describe how they went about practicing with the use of Classcraft and I’m curious as to whether the guided practice sessions through the game have made any difference in their motivation towards practicing. Your response is important to authenticate theirs. So, I would like you to consider these same areas: your students’ motivation towards practicing, your thoughts about the practice strategies learned, and teaching with and through the use of digitalized gamification.

Could you please take a few moments to answer the following questions about your students’ practice habits? The more detailed you can be in your responses the better, especially if you can illustrate your answer with an incident or example. I realize that you at the forefront of your students practicing in varying degrees. I respect that. Please share what you can; everything is appreciated. Once again thank you for your time.

1. MOTIVATION:

Overall – would you say your students are more motivated after the project?

How would you describe your students’ attitude toward practicing before the project and after it: positive or negative? Finds excuses to avoid it? Is it sometimes fun? A sense of responsibility in being prepared for a lesson or band rehearsal?

Do you Recognize the connection between your students’ effort and outcomes? Or attributes success or failure to other causes such as natural ability? Distractions? Other activities?

Do you recognize their independence in making decisions about practicing: when, where, for how long? Reminders?

2. PRACTICE STRATEGIES:

This is the “thinking-doing” part. Much of the time, students KNOW how they should practice, but, for some reason, they don’t put what they know into ACTION.

Would you say that your students’ practice structure is more organized and methodical after the procedure, or is it still random and scattered? Do you sense they now have more of a goal in mind, something specific they want to achieve?
For the most part, do you feel that your students have gained a better sense of achievement of their practice goals after practicing with Classcraft? In addition to the evidence set by assessing practice charts and tests in the procedure, are you able to hear the growth or lack thereof within your student’s playing abilities?

3: PERCEPTION OF DIGITAL GAMES IN THE BAND CLASSROOM

After using the Classcraft game in the band room:

What did you like/dislike about Classcraft?

If you were designing the game, what would you do differently?

Are you more for or against the use of video games or digitally gamified technologies within the band room or other music classrooms?

What benefits could you see from using such technologies?

What detriments can you also foresee with such uses of technology in the music classroom?

Any other comments…

If you have any questions, please get in touch. And, once again, please know how important your feedback is and how much I appreciate your time, your effort, and your support of my work in learning how to be a better music teacher. And, I hope, to share this with other music teachers!
## APPENDIX K

### RUBRIC FOR SELF-ASSESSMENT

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>Splendid Work Elysian!</th>
<th>Acceptable Performance</th>
<th>Dragon Food</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scale of the Week!</strong></td>
<td>Rejoice! There is evidence that you have thoroughly practiced your scale and showcased little to no error in your performance.</td>
<td>Well done paladin. You have presented evidence that you have an acceptable command of your scale and displayed few (2-4) errors in your performance.</td>
<td>Bad Fortune! It seems you are still in need of practice of your skills. You displayed more than 4 errors in your performance.</td>
</tr>
<tr>
<td></td>
<td>AWARD: +2 XP +2 HP +2 PP +2 GP</td>
<td>AWARD: +2 XP +1 HP +1 PP +1 GP</td>
<td>SENTENCE: +2 XP -2 HP</td>
</tr>
<tr>
<td><strong>Method Book Exercise of the Week!</strong></td>
<td>Rejoice! There is evidence that you have thoroughly practiced your scale and showcased little to no error in your performance.</td>
<td>Well done paladin. You have presented evidence that you have an acceptable command of your etude and displayed few (2-4) errors in your performance.</td>
<td>Bad Fortune! It seems you are still in need of practice of your skills. You displayed more than 4 errors in your performance.</td>
</tr>
<tr>
<td></td>
<td>AWARD: +2 XP +2 HP +2 PP +2 GP</td>
<td>AWARD: +2 XP +1 HP +1 PP +1 GP</td>
<td>SENTENCE: +2 XP -2 HP</td>
</tr>
<tr>
<td><strong>Solo!</strong></td>
<td>Rejoice! There is evidence that you have thoroughly practiced your scale and showcased little to no error in your performance.</td>
<td>Well done paladin. You have presented evidence that you have an acceptable command of your scale and displayed few (2-4) errors in your performance.</td>
<td>Bad Fortune! It seems you are still in need of practice of your skills. You displayed more than 4 errors in your performance.</td>
</tr>
<tr>
<td></td>
<td>AWARD: +2 XP +2 HP +2 PP +2 GP</td>
<td>AWARD: +2 XP +1 HP +1 PP +1 GP</td>
<td>SENTENCE: +2 XP -2 HP</td>
</tr>
<tr>
<td><strong>Practice Strategies of the Week!</strong></td>
<td>Rejoice! There is evidence that you have a strong knowledge of the desired practice strategies to be successful on your quest!</td>
<td>Well done paladin. You have presented evidence that you have some skill and command of the practice strategies learned.</td>
<td>Bad Fortune! It seems you are still in need of practice of your skills. You were not able to demonstrate your knowledge of the practice strategies.</td>
</tr>
<tr>
<td></td>
<td>AWARD: +2 XP +2 HP +2 PP +2 GP</td>
<td>AWARD: +2 XP +1 HP +2 PP +1 GP</td>
<td>SENTENCE: +2 XP -3 HP</td>
</tr>
<tr>
<td><strong>Student Choice Strategy!</strong></td>
<td>Rejoice! There is evidence that you have a strong knowledge of the desired practice strategy deemed powerful by your peers!</td>
<td>Well done paladin. You have presented evidence that you have some skill and command of your people's chosen practice strategy.</td>
<td>Bad Fortune! It seems you are still in need of practice of your skills. You were not able to demonstrate your people's chosen practice strategy.</td>
</tr>
<tr>
<td></td>
<td>AWARD: +2 XP +2 HP +2 PP +2 GP</td>
<td>AWARD: +2 XP +1 HP +1 PP +2 GP</td>
<td>SENTENCE: +2 XP -3 HP</td>
</tr>
</tbody>
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REFERENCES


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BIOGRAPHICAL SKETCH

A native of Cataula, GA, John is a graduate of Alabama State University from where he earned a bachelor’s degree in music education. He completed his Master of Music in Instrumental Music Education from the University of Tennessee. Before starting his studies at the University of Florida, John was a middle school band director, music teacher, and active saxophonist in Jacksonville, Florida. His research interests include digital gamification within music education, educational implications of cognition in jazz improvisation, community ensembles, and urban music education.

Throughout his life, John has always expressed an interest in the making of music as well as how music could bring people together. Having some primary musical instruction in voice and piano, John took on formal training on saxophone within the Harris County (Georgia) school system in 1996. Initially thinking this was a great way to meet people, he noticed how music was able to bring his friends together to achieve common goals. While in college, he played in small jazz ensembles, church bands, cover groups, community bands, and volunteered with local school music programs. Through those experiences, John started to develop two identities: a music educator-researcher and an educating musician. He soon was able to exercise his studies and share his experiences as a band director and music teacher in Duval County Public Schools (Florida). In practice, John strove to teach music traditionally through band and choir, innovatively through digital music games, and holistically by exposing and providing his students with playing opportunities and involvements within their respective communities.