Musicianship and gaming: investigating adolescents' experiences

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Musicianship and Gaming: Investigating adolescents’ experiences

A thesis submitted in fulfilment of the requirements for the award of the degree Masters in Education (Research) from University of Wollongong by Kyle Little BMus (Perf), Grad Dip Ed (Secondary)

Faculty of Education
March, 2013
Declaration

I, Kyle Little, declare that this thesis, submitted in fulfilment of the requirements for the award of Masters in Education (Research), in the Faculty of Education, University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. The document has not been submitted for qualifications at any other institution.

Kyle Little

26 March 2013
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Abstract

Guitar Hero and Rock Band have become increasingly popular within the realm of video gaming due to their engaging nature through the use of popular music. Despite the potential for these games to provide valuable learning opportunities, there is limited research to demonstrate any impact on a player’s musicianship. This study addresses this gap by investigating adolescents' experiences with music games to discover the impact of music gaming on their musical skills and knowledge to determine whether these games develop their musicianship.

A phenomenological approach was used to examine the experiences of five adolescents when playing the music games Guitar Hero and Rock Band. The study was guided by three 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 does engaging with these games provide? The study was framed using Elliott's (1995) theory of musicianship and Bourdieu's (1986) theory of capital. Semi-structured interviews with the research participants and observations of them playing the game in their homes were the key data sources. Data analysis was guided by the research questions using concepts from Elliott (1995) and Bourdieu (1986) and with reference to the New South Wales Board of Studies Year 7-10 Music Syllabus (2003), but also sought to identify emergent themes and issues.

The study found that playing Guitar Hero and Rock Band were largely ineffective for developing the participants' musicianship. However, the results suggest that the games provide a context for the participants to apply their prior musicianship developed through their private instrumental and/or music classes. The study also found that playing music games with family and friends provided the participants with social experiences through the creation of group-specific gaming rules; role-playing experiences through the creation of rock star personas; and musical experiences through associating prior musical knowledge and experience to playing the game. Finally, the participants demonstrated their understanding of and skills with the musical concepts duration, pitch and structure, which are commonly taught in New South Wales music classrooms. The findings suggest that Guitar Hero and Rock Band

...
provide players with the opportunity to demonstrate their understanding and skills with the concepts of music, but has limited application for achieving syllabus outcomes in formal school music education. The results also suggest further research into the use of the microphone controller and the *Guitar Hero* composition program in education.
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Chapter 1: Introduction

1.1 Introduction

Music gaming has become increasingly popular within the realm of video games. Titles like Sing Star, Dance, Dance Revolution, Guitar Hero and Rock Band have become a multi-billion dollar industry (Sullivan 2006). These games engage players with fundamental musical concepts, like pitch and duration, through the use of popular music. Despite the common use of technology in music education, there is still little research into whether these games are effective in teaching or reinforcing the concepts of music in formal school music education.

This study investigated adolescents' experiences with the music games Guitar Hero and Rock Band. The aim of the study was to gain a fuller understanding of how adolescents interact with these games and what they learn about music through playing the games. This improved understanding is needed to inform music education about the possible educational benefits that these games could provide, particularly as a new technology to engage students in authentic learning experiences (Learning and Teaching Scotland 2011).

This chapter outlines the purpose and context of this study by explaining the background to the investigation, the questions that guided the inquiry, the significance of the findings, the setting in which it was conducted, the research strategy adopted, and key terms and definitions. The final section provides an overview of the remaining chapters in the thesis.

1.2 Background to the Study

Guitar Hero(released in 2004)and Rock Band (released in 2007) introduced a type of music gaming that involved players in a new musical experience. The original intention of Guitar Hero was to “put players in the shoes of live rock-concert performers” (Miller 2009, p.396). However, the developers of Rock Band in 2007
improved upon the design of *Guitar Hero* to more accurately represent playing a real instrument (Miller 2009).

Early versions of *Guitar Hero* included controllers that were representations of guitar and bass instruments. Later, with the release of *Rock Band*, a drum kit and microphone controller was added. Recent versions of both *Guitar Hero* and *Rock Band* include a guitar, drum and microphone controller. The guitar controller can play either the guitar or bass guitar part in the game. Each game involves one to four players who can play one of the four different instrumental parts simultaneously. Players choose a song from a list of late 1960s to more recent music; most of which are in the styles of rock, punk or metal. The guitar, bass, drum kit and voice parts each have four levels of difficulty, which are displayed using the in-game notation system. Each subsequent level of difficulty includes more complicated rhythms and pitches depending on the type of instrument controller (or part) chosen. Scoring in the game is determined by how accurately players follow the in-game notation through the instrument controller.

The most recent versions of *Guitar Hero* and *Rock Band* engage players in a range of musical opportunities which include: playing a representation of an instrument found in a rock band, playing within an ensemble, reading music, and entertaining an audience. This represented a shift in understanding about how games could engage players musically and sparked interest in how music games could provide benefits to music education (Learning and Teaching Scotland 2011; Miller 2009; Missingham 2007).

Recent research has begun to investigate claims that music games can provide learning opportunities that are a valuable supplement to a music program (Learning and Teaching Scotland 2011; Criswell 2009; Miller 2009; Mercer 2009; Arsenault 2008; Missingham 2007). However, there is still little evidence to suggest that these games can develop a player’s musicianship. This study sought to address this gap in the research by investigating the experiences of adolescents when engaging with music games.
1.3 Purpose of the Study

The aim of this research study was to discover what musical skills and knowledge adolescents develop from playing the Rock Band and/or Guitar Hero games. These music games were chosen specifically for this study due to the following reasons: the number of instrument controllers players can use to play the game, the number of players able to play the game simultaneously, and the different forms of on-screen notation associated with each instrument controller. This study aimed to discover how these aspects of musicianship (Elliott 1995) learned through the game might relate to school music education, and to understand the experiences of the adolescents who play these games. In addition, this study considered how Guitar Hero and Rock Band might be implemented as effective tools for teaching music in schools.

1.4 Research Questions

The study was guided by a broad research question: What do adolescents experience and learn from engaging with music games?

From this broad question, sub-questions were developed over the course of the study to the following:

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 does engaging with these games provide?

1.5 Significance of the Study

This research will advance understanding of music education, which is an essential part of student learning. Music education enriches students’ lives by providing an avenue for creativity and self-expression, a means for self-realisation and self-fulfilment, and an opportunity to develop their skills with and understanding of music. Music is a unique way of communication and expression through sound, as well as providing a context for the understanding and transmission of beliefs and values.
Research into the effect of music education has found that it positively contributes to the emotional, physical, social and cognitive growth of students (Kuzmich 2009; Cutietta 2007; Pascoe et. al 2005; Petress 2005).

The study itself addresses an important current issue in music education, which is how to appropriately integrate technology to engage students and develop their musicianship. Technology is already being used in contemporary music education to engage students in a range of experiences (Kruse & Veblen 2012; Waldron 2011; Criswell 2009; Merrick 2006; Jennings 2005). For example, electronic keyboards and music composition software enable students to compose and perform using synthesised and sampled sounds and graphic notation (Waldron 2011; Jennings 2005; Auh & Walker 1999). Research has found that the effective use of music education technologies creates a more inclusive learning environment by providing a wide variety of learning experiences (Jennings 2005; Pitts & Kwami 2002).

This study is significant in that it investigates the potential for the relatively new technology of music gaming to engage students in music education. It does so by taking adolescents’ game play at home as the starting point for understanding the possible educational applications of music games, rather than starting with a classroom implementation. An understanding of how adolescents engage with these games outside school provides insights into the possible influence that playing these highly engaging entertainment games might have on an adolescent’s musicianship. These insights have been used to consider possible educational applications of music games in school as strategies of develop new and innovative ways to engage adolescents in the music classroom.

1.6 Research Strategy and Context

This study used a qualitative approach, which was appropriate to its exploratory nature. Techniques for conducting qualitative research are valuable for exploring social phenomena as it occurs in its natural setting (Creswell 2007; Stake 2005). Additionally, understanding the multiple realities that each participant brings to the study is an important feature of qualitative research (Creswell 2007; Denzin & Lincoln 1998).
This study used a phenomenological approach that allowed the researcher to understand the experiences of the participants within the context of their home environment. This strategy was chosen for its strength in examining how participants experience a particular phenomenon (Creswell 2007), in this case how adolescents experience music game play. The investigation was set within the context of the participants' home environment, specifically in the location where the music gaming took place, as the context of the study can influence how the phenomenon is perceived (Creswell 2007).

The study used Elliott's theory of musicianship (1995) and Bourdieu's theory of capital (1986) as a framework. Elliott's theory (1995) was chosen to inform this study due to the clear and concise definitions of musicianship. A key feature of this theory is the division musicianship into five forms of musical knowledge that is applied to different musical activities. This study examined how the participants' descriptions related to these forms of knowledge. Bourdieu's theory of capital suggests that capital is a type of social asset, which is inherited and continually developed and exchanged over the lifetime of the individual (Bourdieu 1986). This study examined how the participants used their capital when playing the game, and determined how their capital was being developed.

Five participants were recruited to participate in the study by meeting specific inclusion criteria. Participants were chosen on the basis of having prior experiences with playing music games, being enrolled in Year 7 or 8 at the time of the study, and owning legal copies of the games. Additionally, four participants were chosen because they were receiving or had previously received private instrumental lessons. Interviews and observations were the primary data sources for this study. Two semi-structured interviews took place in the participant's home environment. The first interview with the participants consisted of asking general questions about their experiences with the games. Following, the researcher developed a specific list of interview questions for each participant based on their responses in the first interview and discussed these with the participants in the second interview. These provided insights into the way participants experienced playing music games. Observations made while the participants played the game and details of the home environment that
may have impacted how the participants experienced playing the music games provided additional sources of information.

After the data collection was complete, the interview transcriptions were analysed to identify categories and themes. Observational data was used to support the interpretation of the interviews and aided in developing themes. The researcher focused on the significant statements made by the participants, and wrote descriptions of how they related to the themes. Following, the researcher wrote the overall essence of the phenomenon, which focused on the common experiences of the participants.

1.7 Key Terms and Definitions

This section defines the major terms that are used through this study.

- **Musicianship**: A definition developed by Elliott (1995) to describe the knowledge, actions and emotions as they relate to music.
- **Music games/Music gaming**: Video games that require a player to use an instrument controller to play or sing a specific form of graphic notation being displayed on the screen. In this context of this study, this refers specifically to the games *Guitar Hero* and *Rock Band*.
- **Instrument controllers**: The guitar, drum and microphone controllers used to play *Guitar Hero* and *Rock Band*.
- **Authentic instruments**: Genuine musical instruments that are not game-based (e.g. violin, trumpet, acoustic or electric guitar).
- **On-screen notation**: The type of notation displayed in *Guitar Hero* and *Rock Band* that is used to play the instrument controllers.
- **Star Power/Overdrive Power**: A feature of *Guitar Hero* and *Rock Band* which allows players to gain achievements by accurately playing the on-screen notation in the shape of stars. Player can then use these achievements strategically in a song to score extra points and/or not be penalised for making mistakes while playing the on-screen notation.
- **GH Mix**: A composing program featured in *Guitar Hero*. 
1.8 Structure of thesis

This opening chapter has outlined the rationale for the study and provided and overview of the investigation. Chapter Two provides a review of the relevant literature focusing on The Arts in education, technology in music education, music gaming, and the use of music gaming in education. Chapter Three describes the research design and theoretical framing, and details the phenomenological approach used, the participant recruitment process, data collection and data analysis. Chapter Four presents the results of the study and includes a discussion of the themes identified. The final chapter, Chapter Five, presents the findings in response to the research questions, discusses the implications for practice and suggests possibilities for future research. Supporting documents to which readers may wish to refer are included in the appendices at the end of this thesis.
Chapter 2: Literature Review

2.1 Introduction

This chapter will discuss current research in the field of music education and music gaming in two parts. The first part will first present the case for the importance of The Arts in education, followed by an examination of research into the use of technology in music education, music gaming and music gaming in education. This research will be used to establish a clear gap in understanding music game playing by adolescents and the relationship between music gaming, music learning and musicianship. The second part of the chapter presents an analysis comparing the most recent version of the games Guitar Hero and Rock Band to the New South Wales (NSW) Board of Studies (BOS) Year 7-10 Music Syllabus (2003) and a major theory of musicianship. This analysis provides the basis for the research conducted in this study.

2.2 Part 1: Review of the Literature

Education in The Arts can enable students to learn and communicate through visual arts, media, dance, music and drama. Students can explore, interpret and create; expressing ideas, experiences, values and beliefs by drawing on their own creativity and imagination (Alter, Hays & O’Hara 2009). Education in The Arts provides a way of presenting ideas and developing understanding through interactions at a symbolic level (Alter, Hays & O’Hara 2009).

Education in The Arts promotes the skills students need to be successful in the outside world. This enables students to direct their learning, and improve their critical and creative thinking and problem solving (Scholes & Nagel 2009). The Arts can also enhance confidence, self-esteem and self-image (Simons & Hicks 2006). The Arts gives students the opportunity to interact with their inner feelings and discover new things about themselves within a safe environment.

Music education, as a key art form in The Arts, engages students in new experiences through sound and movement. It enables students to learn new ideas; and provides
opportunities to be creative and spontaneous through performing, composing, listening and improvising activities (Pascoe et al. 2005; Board of Studies NSW 2003). Music education also provides students with an alternative method of communication through the medium of creativity and sound (Green 2005b; Petress 2005; Swanwick 1988).

There are a number of perspectives over the direction of music education. Many of these approaches are similar in their goal to improve music education through different learning experiences, but have different perspectives as to how that can be achieved. One perspective of music education asserts that music education should be an aesthetic experience focusing on the aesthetic elements of musical works such as melody, harmony, rhythm, tone colour, texture and form (Reimer 1989). In the context of music education, aesthetic refers to the perception and contemplation of musical elements rather than focusing on how they are created (Elliott 1995). Through focusing on the aesthetic elements of music, students can learn the value of music and understand its place within their lives and society (Reimer 1989). This takes on the perspective that improving music education should focus on the philosophy of why people value specific art forms, while (in part) taking into account the psychological development of the students.

Another perspective suggests that music educators should focus on how students perceive, understand and value music (Swanwick 1988). Students develop their understanding and mastery with sound materials by improving their imaginative and imitative processes through composing, performing and listening activities (Swanwick 1988). Therefore, students should learn to imitate and manipulate sound through exploring different styles and genres of music as a means to understand how they are created. Additionally, this perspective focuses on a psychological understanding of how students engage with music through various learning experiences, and developing a curriculum based on the specific students in the classroom (Swanwick 1988).

A final perspective on music education asserts that learning and understanding music does not only concern itself with the way people perceive and value music, but also the way that students and musicians engage with music within a specific context (Elliott 1995). This perspective further stipulates that music educators should not
conceive music as an object or a thing that a person values, creates, or listens to. Rather the success of a person's ability to manipulate sound materials is a culmination of a person's developing musical knowledge, thoughts and consciousness put into action (Wiggins 2009; Elliott 1995). Students improve their ability to perform, compose and listen by applying their prior knowledge and skills to a given context. This type of hands-on learning enables students to experience and enjoy music on different physical, social and emotional levels (Wiggins 2009). As the understanding and practice of music education has evolved, so has the technology being used in music classrooms as a way to engage students in composing, performing and listening.

Over the past 20 years technology has become increasingly integrated into the school music curriculum. Music technology provides new musical hardware and software to create and perform more contemporary music. As governments and policy makers have come to understand the importance of technology in today’s job market, new initiatives have been adopted to incorporate more technology in the music classroom (Pascoe et al. 2005).

Technology in music education is continually evolving (Crawford 2008; Ferreira 2007). This has led to interest in new tools, methods and pedagogies used by music teachers in the classroom. Research studies examining technology in the music classroom are often focused in the following areas: the shift in the types of technologies used (Pitts & Kwami 2002), student inclusion and engagement (Dickey 2005), attitudes of teachers and students towards technology (Paravantis 2010; Oral 2006), and the types of music technologies being used in the classroom and their effectiveness (McDowall 2003). Additionally, research has been conducted into the use of music gaming as a tool for teaching and learning at school (Learning and Teaching Scotland 2011; Miller 2009).

This literature review focuses on three main areas within this body of research that are relevant to this study: technology in music and music education, research in music gaming, and music gaming in education. This is followed by an analysis of the music game used in this study, Guitar Hero, which compares the features of the game to the relevant school syllabus and concepts from musicianship theory. This review and analysis presents an appraisal of current research into the effectiveness of music
gaming and its implications in the field of education, and the gap in the research that this study addresses.

2.2.1 Technology in Music and Music Education

There has been an evolution in the types of technologies being implemented in music education over the past 20 years. The invention of MIDI (Musical Instrument Digital Interface) in 1983 saw the development of computer software to extend the capabilities of modern musical instruments, and enable students to develop and reinforce musical concepts without the aid of a music teacher (Jones 2003). Later, new forms of multimedia presentation methods were developed which included music games, guided instruction and compositional programs (Peters 1992). More recently, high speed internet, more powerful computers and digital technology have given teachers and students more direct access to a variety of music genres (Webster 2002). For example, YouTube has become increasingly popular with music teachers as a tool for teaching and demonstrating musical concepts through the use of instructional videos (Kruse & Veblen 2012; Waldron 2011) and music composition programs provide the opportunity to create and manipulate music that students enjoy listening to (Challis 2007).

These technological developments have led to suggestions that music education needs to change by devising new approaches that meet the needs and challenges of the contemporary world (Jorgensen 2003). This is supported by research that attributed a noticeable decline in the number of students who continue music in the final years of high school to school social factors, limited music education funding, or music education curriculums that focused too much on older pedagogical styles which lack relevance for students (Ng & Hartwig 2011, Pascoe et al. 2005).

Music technologies that simplify setup and use have had a beneficial impact on student engagement and inclusion in the classroom. It has been suggested that simplified technology reduces costs, allowing more students access to music education (Wise, Greenwood & Davis 2011), while shortening the preparation time for lessons (Pitts & Kwami 2002). Teachers are able to focus their time on engaging students in the lesson content rather than on teaching students how to use the technology. These simplified technologies can help teachers to employ more
sophisticated, user-friendly computer music software that engage students in varied learning experiences.

Music software can enable students and teachers to engage with and organise sounds in new and innovative ways (Savage 2005). Music composition programs like *Finale* and *Sibelius* gives students the opportunity to compose music using traditional notation. These programs allow students to enter melodic and rhythmic values and then hear their composition played back using realistic instrument sounds. Other composition programs like *Melody Maker* simplifies the use of traditional notation while not relying heavily on prior musical knowledge. A study examining the use of *Melody Maker* in a primary classroom found that younger and less experienced students were more engaged with exploring the various functions of the program when compared to older more experienced students (Hewitt 2009). Additionally, the study found that the program's easy to use interface attributed to the increase in the length of compositions over time. This study suggests that computer-based approaches to composition allow children freedom from conventional means of composing, such as notation and keyboard skills.

Some newer composition programs that do not rely on prior knowledge of music and music notation offer a more inclusive learning environment. Graphic notation software, for example, enables students to compose music using their own type of music notation or one provided by the software. A study using *Hyperscore* (a graphic notation composition program) with 9-11 year old students found that they were able to engage and compose with music rudiments such as note values, pulse, rhythm, pitch, melody and dynamics (Jennings 2005). Furthermore, the students were able to imagine and externalise musical sounds accurately in rhythm and pitch by adopting a specific composing strategy. Students were first asked to imagine what they wanted to compose and then input what they imagined using specific pitches and rhythms. Emphasis on graphic rather than traditional notation in schools is more inclusive and offers a gateway to other musical genres (Jennings 2005; Auh & Walker 1999).

Recording and looped based software have become increasingly effective with teaching and engaging students in composing activities. A recent on-going study examined the compositional processes of 14-16 year old high school music students using a MIDI keyboard, a computer and two composing/recording softwares (*Garage*
Band and Cubase) (Kirkman 2010). The preliminary results of the study found that the use of multiple technologies and software kept the students engaged by not restricting their creativity. Additionally, through the aid of the classroom teacher, the students developed their organisational skills throughout the compositional process by composing their music in multiple phases. However, the study suggested that success with the composing activity was based on the teacher's and the students' prior knowledge and skill with the computer software. The use of multiple composing softwares as a tool for teaching could pose some problems in terms of the students learning to use the technology, however this can be mediated through the teacher's use of scaffolding and placing limitations on the composing activities (Nevils 2012; Kirkman 2010).

There is mixed evidence about the importance of music technology in the classroom. For example, a study into the relationship between technology resources and teacher’s ability to teach the music curriculum content found that, even without an abundance of technological resources, the teacher was able to engage the students while effectively teaching the curriculum content (Crawford 2008). This could be due to the training the teacher has received and the teacher’s understanding of her students’ needs. Another two studies examining the impact of technology on students’ performance in music composition discovered that the students were more effective and efficient in composing with software when compared to traditional handwritten compositions. This was as a result of the students' ability to make major and minor changes to their compositions quickly and easily. As a result of the studies, it was suggested that composition software and technology should be used to improve the quality of music education (Nevils 2012; Pitts & Kwami 2002). These studies suggest that there is an appropriate place for technology within a music program, but that the role of technology in engaging students and improving performance is yet to be firmly established.

2.2.2 Research in Music Gaming

Music games are claimed to provide specific educational opportunities as a valuable supplement to a music program (Miller 2009; Mercer 2009; Arsenault 2008). There are, however, a limited number of studies that explore the various educational affordances offered by music games. This section closely examines two research
papers and a review article about the two music games that were the focus of the research presented in this thesis, *Guitar Hero* and *Rock Band*.

There have been two research studies exploring the educational benefits of *Guitar Hero* and *Rock Band* reported in the research literature (Miller 2009; Missingham 2007). One study presented an analysis of how the guitar controller's graphic on-screen notation in the game can be represented in traditional notation. Additionally this study conducted an on-line survey which asked 509 respondents about how these games related to their ideas and knowledge of music (Miller 2009). The other article conducted surveys and interviews with adolescents and music professionals asking questions about the educational affordances that these games could provide (Missingham 2007). A review article of *Guitar Hero* compared the graphic notation in the game to melodic notes found on frets of the guitar and the keys on a piano, demonstrating how each control button can represent a number of pitches (Arsenault 2008).

There are a number of important similarities and differences between the guitar controller and an authentic guitar, which might influence how the game is experienced. A comparative analysis of the *Guitar Hero* guitar controller and an electric guitar found that the similarities could be divided into three different areas: music and guitar fundamentals, *Guitar Hero*’s physical interface, and *Guitar Hero*’s visual interface (Arsenault 2008). Music and guitar fundamentals included elements of pitch, rhythm, melody and harmony, however it was argued that the game lacks elements of timbre and dynamics, which are part of the basic elements of music (Arsenault 2008). The researcher noted several limitations of the guitar controller when comparing its physical interface to an authentic guitar (Arsenault 2008). This included the number of buttons on the neck of the controller, which are meant to represent at least two-dozen different pitches heard in the game. The visual interface of the game successfully represented melody, harmony and rhythm through the use of simulated guitar fret board (Miller 2009; Arsenault 2008).

Some of the comparisons made in the review article (Arsenault 2008) have since been refuted in an interview with the *Guitar Hero* lead game designer (Miller 2009). For example, the lead game designer indicated that *Guitar Hero* was not intended to simulate playing an authentic musical instrument (Miller 2009). Rather, the game
developers intentions were to create a music or rock performance simulator, "bringing people the feeling of playing music" (Miller 2009, p. 412). Additionally, the main ambition of the game developers when initially designing the game was to introduce aspects of performance and showmanship to the experience. The guitar controller was initially designed to give the player the opportunity to play the game easily without significant amounts of practice. As the game grew in popularity, the developers of Rock Band incorporated the microphone and drum controllers, which were intended to more accurately represent playing a real instrument or being musical (Miller 2009). As described earlier, performance is an important aspect of music education, as a means for developing musical understanding (Elliott 1995). Therefore, the intentions of the game developers to include aspects of performance or being musical may impact on how players experience the game, and on the game’s applicability to an educational context.

It has been suggested some aspects of musicianship could be supported by playing Guitar Hero (Miller 2009; Missingham 2007). A web-based survey found that participants had developed an appreciation for new songs and genres (Miller 2009). A professional guitarist suggested that the Guitar Hero game helps to develop three different musicianship skills found in playing music on a traditional instrument (Miller 2009). These skills included scanning & decoding the graphic notation, decoding in-game instructions and thinking strategically when playing difficult solos. Another study that interviewed professional musicians found that these games could help with developing musical skills, including hand-eye coordination, memory, concentration and problem solving (Missingham 2007). The two research articles suggest that musicianship is an aspect within the Guitar Hero game. Therefore, further research should be conducted into whether participants actually experience or are able to describe these aspects of musicianship as described in research articles (Miller 2009; Missingham 2007).

Evidence from the web-based survey suggested that early versions of Guitar Hero do not provide the opportunity for players to feel or be creative (Miller 2009). This lack of creativity in early versions of Guitar Hero game may be due to the fact that players do not compose within the game, or are unable to change aspects of the songs that they play. However, the researcher suggested that the evidence from the survey could
not be correlated with the perspectives encountered during later interviews with players of the games and professional musicians. The researcher concluded that further research on *Guitar Hero* and creativity should be conducted (Miller 2009).

Music games may provide an entry point into music for young people (Missingham 2007). A web-based survey of adolescents between the age of 14 and 18 years reported that they played music games for the following reasons: the participants' interest in music; they involved the players with aspects of music; the challenging nature of the games; and they provided an opportunity for social interaction. Additionally, the survey found that music games inspired adolescents to be more interested in music and could be used as a practice aid to support playing of "real" (authentic) instruments (Missingham 2007). Further, some of the younger participants in the study stated that *Guitar Hero* had a positive influence on their decisions to play real instruments (Missingham 2007). However, in additional focus group interviews with music professionals and adolescents there was an even divide within the groups over whether the skills learned with playing music games could be compared to playing an authentic musical instrument or singing. This suggests that there may be some confusion among the study participants as what constitutes playing or making music.

Music games can provide a safe environment for players to build confidence for real performances (Missingham 2007). When asked questions regarding their experiences with playing music games, some participants stated that at times they felt less nervous playing the game in front of a simulated audience in comparison to performing in front of a real audience (Missingham 2007). Other participants felt that music games were purposeless, and that they could not replicate the same feelings of anticipation, passion and excitement connected with authentic performances (Missingham 2007). The researcher suggested that music games might offer a safe facsimile of the authentic experience of performing for some, but argued that more evidence is needed (Missingham 2007). The differences in opinions among the participants could be a result of their varied exposure to different performance opportunities, but as the article did not describe the participants’ background in music and/or music performance this remains a question for future research.
2.2.3 Music Gaming in Education

The use of commercial video games as a tool in education has received an increased research focus as educators realise their possible educational benefits (Bavelier et al. 2011; Moshirnia & Israel 2010; Sandford, Ulicsak & Facer 2006; Gee 2003). Research into commercial video games and learning have found that they can motivate students (Hayes & Silberman 2007), increase cognitive function due to their repetitive nature (Bavelier et al. 2011; Gee 2003), improve players' selective visual attention (Green & Bavelier 2003) and improve a player’s memory (Boot, Blakely & Simons 2011). Video games can also put players in a virtual world, allowing them to take on the identity of the characters they are playing, as well as problem solve and strategise in contexts that are not possible in a classroom (Gee 2003).

In recent years, researchers and educators have looked at ways to incorporate or modify commercial video games to be used in an educational context (Angelone 2010; Moshirnia & Israel 2010; Panoutsopoulos & Sampson 2012). Studies have examined video games that are based in specific historical contexts or require players to perform particular actions. By modifying the delivery system of the game or incorporating information displays which included pop-up windows with historical information, the modified games were shown to increase a learner's knowledge of the specific historical content (Moshirnia & Israel 2010) and support the educational activities and objectives (Panoutsopoulos & Sampson 2012).

Music education researchers have begun to examine ways to incorporate music games like *Wii Music*, *Guitar Hero*, *Rock Band* and *Sing Star* into their curriculums to help improve student engagement. A case study in Scotland used the *Guitar Hero* game as a platform for cross-curricular thematic learning in a primary class. The aim of the project was to help improve student motivation and engagement through the use of gaming consoles (Learning and Teaching Scotland 2011). The research group, in conjunction with teachers, used the overall themes and ideas from the game to create lesson units targeting a series of key learning areas among all the school subjects. Amongst the positive educational benefits were a greater commitment by students to the learning activities associated with the project when comparing prior school terms (Learning and Teaching Scotland 2011). Additionally, the program enhanced student
group work because of the common interest in *Guitar Hero* and motivated students to take control of their own learning (Learning and Teaching Scotland 2011).

These findings suggest that given the right context, students can be motivated to participate in a variety of music gaming activities that will increase their overall quality of work (Learning and Teaching Scotland 2011). Although the researchers suggested that students are motivated by their enjoyment of Rock and Roll through the use of *Guitar Hero* (Learning and Teaching Scotland 2011), there is still a gap in understanding about how adolescents perceive and play the game. The research coordinator concluded that “you need some degree of musical ability in order to be successful at [*Guitar Hero*]” (Learning and Teaching Scotland 2011), however there is no evidence provided to support this.

### 2.2.4 Summary

There have been a number of claims that suggest that some music games can engage the player, while also teaching basic music concepts and fundamental instrumental techniques through the use of exercises and mini-games (Nardo 2010; Criswell 2009; Missingham 2007). However, there is still limited research into the relationship between formal learning of music, and informal learning through music gaming. There is also limited evidence to suggest that music gaming provides players with an in-depth understanding of the basic music elements taught in music education classrooms. Further research into music gaming could lead to a better understanding of what players are learning and experiencing when engaging with these types of software. This is needed to inform strategies for integrating music games effectively into formal educational contexts.

Current research in music gaming is limited. For example, the review article (Arsenault 2008) contained limited references to support claims and instead relied on the author’s own musical knowledge and experience. Similarly, the research article (Miller 2009) on *Guitar Hero* had several limitations in terms of methodology and theory. The article did not include a literature review, further suggesting a the lack of literature in this specific field. In addition, the researcher did not explain the methodology used when analysing the data, or what theoretical constructs informed the study. Furthermore, the study examined the use of *Guitar Hero* and *Rock Band* in
a sociological and ethno-musicological context, but did not explore the specific aspects of musicianship gained from interacting with these games.

By contrast, a comprehensive study examined the impressions adolescents and professional musicians had of music games like *Guitar Hero* and *SingStar* (Missingham 2007). This article included a short literature review of the games themselves, but did not include any research into music games and education. The research suggested that music games can teach players the concepts of music as well as other technical skills (e.g. hand-eye coordination) (Missingham 2007). However, these claims are solely based on interviews with professional musicians, rather than from the adolescents who played the games. This gap suggests that further research is needed to examine the experiences of adolescents who have some or limited prior musical knowledge.

In summary, there is clear need for more research to advance understanding of adolescents’ experiences when playing music games like *Guitar Hero* and *Rock Band* to determine whether there are any benefits for musicianship or music learning. The current study aimed to address this gap by providing a better understanding of the relationship between music gaming, music learning and musicianship and identify possible implications for music education.

### 2.3 Part 2: Analysis of *Guitar Hero*

This part examines and compares the music games *Guitar Hero* and *Rock Band* with a unifying theory of musicianship and the NSW BOS Years 7-10 Music Syllabus (2003). The purpose of this analysis was to determine whether these games had potential to develop a player's musicianship according to relevant theoretical constructs and whether they could be used in an educational context to meet syllabus outcomes. This analysis is important as it is a culmination of the previous research and theories in this field, thus providing a context for the current research. The analysis began with the creation of a table to compare elements of the games *Guitar Hero* and *Rock Band* with David Elliott's Philosophy of Praxial Music Education (1995) (see Appendix A). A further step was undertaken to compare the elements in the game to the NSW BOS Year 7-10 music syllabus (2003) outcomes.
These elements included the on-screen controller notations for Guitar Hero and Rock Band, the practice feature of Guitar Hero, and Guitar Hero's composition program GH Mix. The information gained from this analysis provided a better understanding of how these games compared to the syllabus methods of teaching the concepts of music and musical notation; how these games could be used to engage students in performing, composing and listening activities; and how these games could be used to develop a student's musicianship. The following paragraphs provide a description of the theory of musicianship used, the syllabus and the games. This is followed by a discussion of the results of the analysis.

2.3.1 Musicianship

David Elliott developed The Philosophy of Praxial Music Education (1995) as a way to explain the multidimensional facets of music, musical understanding, and an approach to achieving those values through music education. This theory asserts that in order to achieve those values, a person must continually develop their musicianship.

The term musicianship is used to describe the act of making and creating music through the use of an instrument, voice or by composing. Musicianship is comprised of five distinct types of musical knowing: procedural, formal, informal, impressionistic, and supervisory knowledge (Elliott 1995). According to the theory, making or creating music is essentially a matter of procedural knowledge in that musicianship is demonstrated through actions, not words. As musicianship is procedural in essence, the four other kinds of knowledge contribute to procedural knowledge in a number of ways (see Figure 2.1). Table 2.1 explains the different types of musical knowledge as they relate to musicianship.
Figure 2.1. *Flowchart of the hierarchical relationships between the forms of musical knowledge within musicianship*

<table>
<thead>
<tr>
<th>Type of Musical Knowledge</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedural</td>
<td>All forms of musicianship are based on the procedure of making music. Elliott’s theory on procedural musical knowledge focuses on the act of making quality sounds on an instrument as part of musicianship.</td>
</tr>
<tr>
<td>Formal</td>
<td>Formal musical knowledge includes knowing and understanding verbal and non-verbal facts, concepts and theories related to music. It also enables students to apply their formal knowledge to playing or composing music.</td>
</tr>
<tr>
<td>Informal</td>
<td>Informal musical knowledge is a type of practical common sense developed over time. This involves the ability to reflect critically in action, which is dependent on knowing when and how to make musical judgments within a particular context.</td>
</tr>
<tr>
<td>Impressionistic</td>
<td>Impressionistic knowledge is rooted in intuition and emotion, in that it relates to the emotions pertaining to each experience. Emotions can arise from personal knowledge and beliefs about people, events and even situations.</td>
</tr>
<tr>
<td>Supervisory</td>
<td>The ability to problem solve, strategize, plan and create goals. It is a type of musical self-management, which is developed through formal or informal educational contexts.</td>
</tr>
</tbody>
</table>
2.3.2 The Syllabus

The NSW BOS Years 7-10 Music Syllabus (2003) divides the music program into two main areas: musical knowledge, and music skills. Through performing, composing and listening activities (learning experiences), student are taught six concepts of music, which comprise: duration, pitch, dynamics and expressive techniques, tone colour, texture and structure. Table 2.2 outlines the three learning experiences and table 2.3 outlines the six concepts of music as defined in the NSW BOS Year 7-10 Music Syllabus (2003).

Table 2.2. *NSW BOS Year 7-10 Music Syllabus (2003) definitions of the Learning Experiences*

<table>
<thead>
<tr>
<th>Learning Experience</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performing</td>
<td>A means of self-expression, interpreting musical symbols and developing solo and/or ensemble techniques.</td>
</tr>
<tr>
<td>Composing</td>
<td>A means of self-expression, musical creation and problem solving.</td>
</tr>
<tr>
<td>Listening</td>
<td>A means of extending aural awareness and communicating ideas about music in social, cultural and historical contexts.</td>
</tr>
</tbody>
</table>

Table 2.3. *NSW BOS Year 7-10 Music Syllabus (2003) definitions of the Concepts of Music*

<table>
<thead>
<tr>
<th>Concept of Music</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration</td>
<td>The lengths of sounds and silences in music and includes the aspects of beat, rhythm, metre, tempo, pulse rates and absence of pulse.</td>
</tr>
<tr>
<td>Pitch</td>
<td>The relative highness and lowness of sounds. Important aspects include high, low, higher and lower pitches, direction of pitch movement, melody, harmony, indefinite and definite pitch.</td>
</tr>
<tr>
<td><strong>Dynamics and expressive techniques</strong></td>
<td>Dynamics refer to the volume of sound. Important aspects include the relative softness and loudness of sound, change of loudness (contrast), and the emphasis on individual sounds (accent). Expressive techniques refer to the musical detail that articulates a style or interpretation of a style.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Tone colour</strong></td>
<td>The aspect of sound that allows the listener to identify the sound source or combinations of sound sources.</td>
</tr>
<tr>
<td><strong>Texture</strong></td>
<td>The way voices and/or instruments are combined in music.</td>
</tr>
<tr>
<td><strong>Structure</strong></td>
<td>The idea of design or form in music. In organising sound the concepts of duration, dynamics, pitch and tone colour are combined in some way for a particular purpose. Structure relates to the ways in which music sounds the same (or similar) and/or different.</td>
</tr>
</tbody>
</table>

### 2.3.3 The Games

The most recent versions of *Guitar Hero* and *Rock Band* include video game controller representations of a guitar and drum kit, as well as an authentic microphone. Each game involves one to four players who can each play one of the four different instrumental parts simultaneously. Within each game, players choose a song from a list ranging from the late 1960s to more recent music. There are four levels of difficulty for each instrument controller, which are displayed using the in-game notation system. Increasing levels of difficulty include more complicated rhythms and pitches depending on the instrument controller chosen. Players score in the game by accurately reading the in-game notation and then playing or singing using the instrument controller.

### 2.3.4 Results of the Analysis

The results of the analysis presented here begins with a comparison of the on-screen notation of the guitar, microphone and drum controllers in *Guitar Hero* and *Rock Band* to music notation commonly used in schools (Western notation, graphic...
notation and guitar TAB). Following, the analysis compares the features of the Guitar Hero and Rock Band games to the learning experiences in the NSW BOS Year 7-10 Music Syllabus (2003): Composing, Listening and Performing. Finally, an analysis of features of the games and an analysis of how the games are played are compared to Elliott's (1995) theory of musicianship.

**Notation**

Music notation is a system of writing that represents music that is heard. In the NSW BOS Year 7-10 Music Syllabus (2003), students are taught to read different types of notation, including Western notation, graphic notation and guitar TAB. Knowing how to read and play music notation represents formal knowledge within musicianship. Most notation systems express concepts of duration (the length of sound) and pitch (the highness and lowness of sound). With most commonly studied styles of notation, pitch is represented along the y-axis and duration is represented along the x-axis. This differs greatly from the game guitar and drum controller notation, as it is an exact reverse of these principles (Figure 2.2).

![Common Notation Styles vs Guitar Hero and Rock Band Guitar Notation](image)

**Figure 2.2.** How pitch and duration are represented in common music notation along an X and Y-axis in comparison to Guitar Hero and Rock Band guitar notation.

The proceeding sections will analyse Guitar Hero notation to establish how effective this style of notation could be taught through the syllabus. Therefore this analysis will be conducted through the lens of three styles of notation commonly taught in classrooms: Western notation, Guitar TAB and graphic notation. This article will first focus on the guitar controller notation, as this is the most commonly used among players. Subsequently the drum and microphone controller will be examined.
Guitar controller notation

The guitar controller notation in *Guitar Hero* and *Rock Band* is a pictorial representation of the instrument controller. Pitch in the game is represented by five different coloured notes written on the screen (green, red, yellow, blue, orange), which is directly mirrored in the layout of the five different buttons on the guitar controller (see Figure 2.3). Duration is represented through different sized horizontal bars scroll down the screen that represent the different beat groupings, through the distance of each note and lines that represent that a note is to be held longer. Players must read the downward scrolling on-screen notation while pressing a coloured button in the left hand (for right handed players), and strum the particular rhythm in the right hand.

![Figure 2.3. A pictorial representation of the Guitar Hero's guitar controller on-screen notation](image_url)
The guitar controller notation is very similar to Western notation in the way that the pitch is organised through the position of the note on the staff. However, due to the five buttons on the guitar controller there are a limited number of pitch possibilities in comparison to Western notation. The on-screen notation represents duration similar to Western notation in the sense that it is conveyed through beat groupings. The horizontal lines that scroll down the screen in the guitar and drum controller notation represent three distinct forms of rhythmic division from smaller to larger divisions. The purpose of the bar lines in Western notation is to organise the music into larger beat groupings (see Figure 2.4).

The guitar controller notation in Guitar Hero and Rock Band has some similarities with guitar TAB. The notational style in guitar TAB mirrors the strings on a guitar, similar to how the on-screen notation mirrors the coloured buttons on a guitar. Rhythm in this style of guitar TAB is mainly represented either through groupings of fret numbers or through bar lines (see Figure 2.5). This is similar to how the on-screen notation groups the coloured buttons together to represent a specific rhythmic pattern. If a note is to be played longer, it is represented in the on-screen notation as a long line streaming behind the coloured dot. This is similar to guitar TAB, as the fret number followed by a series of dashes or lines represents a longer note.
Microphone controller notation

The microphone controller notation is almost an exact representation of graphic notation in both the concepts of pitch and duration (see Figure 2.6). The length of the line or bar represents duration, where the position of the line/bar along the y-axis represents pitch. Additionally, the microphone controller's bar lines is an exact replica of Western notation in the way the music is read from left to right and the position of the bars.

Figure 2.6. Comparing graphic notation to Guitar Hero's microphone controller on-screen notation
Drum controller notation

The drum controller notation is very similar in style to the guitar controller with some slight modifications and additions (see Figure 2.7). There are three different drum pads on the bottom, two high hat/cymbal pads that sit above and a foot/kick pedal underneath. The coloured notes have been arranged to mirror in part the layout of the drum controller. A player hits the appropriate pad with a drumstick when they see the appropriate coloured note hit the play line. The foot pedal is the only portion of the drum controller that is not represented by a circular coloured note, rather it is represented by a thick white line that is placed on the subdivided beat, beat or bar line.

Composing

Composing music entails organising sound in a particular way. As outlined in the NSW BOS Year 7-10 Music Syllabus (2003) students are to compose music using a variety of musical instruments, styles of music notation and music technology. The act of composing relates to procedural knowledge within musicianship (Elliott 1995). The release of Guitar Hero: World Tour in 2008 included a new feature called GH Mix (Guitar Hero Mix), which gave players the opportunity to compose and record a piece of music using the Guitar Hero technology. Controlled by the guitar controller, drum controller or game controller players can compose music for up to five different instruments found commonly in a rock, jazz or heavy metal band, including: rhythm guitar, lead guitar, bass guitar and drums. Due to the large number of features GH Mix offers, it is difficult to include them all in this chapter, however the most notable features as they relate to the concepts of music will be discussed.
Figure 2.7. A pictorial representation of Guitar Hero's drum controller on-screen notation

The program allows players to input and manipulate elements of pitch and duration throughout their composition. Players are able to choose the tonality of the scale (major, minor, pentatonic, etc.) to be used within the composition and the note the scale will start on. A legend or key is included on the side of the screen that displays the notes or chords of the chosen scale with the corresponding coloured buttons. If a player wishes to use a custom scale for their composition, a setting is included that allows the player to create the scale on a Western music staff system, which is later translated to specific coloured buttons on the guitar controller. Players control and manipulate duration through setting the value of the horizontal lines to a 1/2, 1/4, 1/8, etc. This gives the player the opportunity to compose using a variety of rhythmic figures and rhythmic patterns.
GH Mix features a number of controls which allow the player to input and manipulate concepts of tone colour, texture and structure within their composition. Players are able to choose the style of each instrument as well as add specific effects to each instrument. For example, a player can choose to use a reggae-style guitar with a wah-wah pedal or a blues drum kit with brushes.

Listening

The Guitar Hero and Rock Band games can help to develop a player's listening skills. As outlined in the NSW BOS Year 7-10 Music Syllabus (2003), students are to develop their listening skills by through aurally recognising and discussing the concepts of music within music they play and listen to. Within musicianship, listening relates to the amount of attention a person places on sounds they hear, and the person's ability to recognise and respond to musical sounds (Elliott 1995). Players are required to listen to the song while playing the on-screen notation on their instrument controller. In any given song there could be a number of different instruments playing and/or voices singing. As players are only responsible for playing one instrument controller they would need to discriminate between all the sounds heard and recognise which instrument they are playing. Additionally, there are times in a song where the instrumentation changes and the on-screen notation shifts to represent a different instrument. For example, a player could go from playing the electrical guitar part to playing an electric keyboard part on the same instrument controller. The player would need to watch the screen and be able to aurally recognise the change. Players of the game would be able to listen to the various textures of the instruments, listen for changes in structure as well as changes in metre and rhythm. In most cases, structural elements in the game including verse, chorus and bridge usually have similar notational elements within a song; therefore notation would frequently repeat itself in those sections. The player’s attention would then be recalling the notes and sounds within a section, making it more familiar to the player.

The way a player listens is very different with the microphone controller. When players are singing they need to listen to the background music while watching the on-screen notation and reading the lyrics. Depending on the level of difficulty chosen, the program would be more or less strict with the pitch and rhythm. On the easiest level of difficulty the player does not need to start on the exact note, but instead the
game registers whether the player is singing the correct interval distance between notes. Harder levels of difficulty would require players to not only listen to themselves, but also to the background music to ensure they are singing in tune. The game lets the player know immediately if they are singing out of tune, which gives players the chance to correct their pitch.

**Performing**

Performing is one of the most limiting elements within the *Guitar Hero* and *Rock Band* games when compared to the NSW BOS Year 7-10 Music Syllabus (2003) and Elliott's theory (1995) of musicianship. According to the syllabus (2003), students are required to perform different styles of music by singing or playing instruments, by reading music notation and by using different forms of music technology. Performing relates directly to procedural knowledge within musicianship (Elliott 1995). Players are to use the other four forms of knowledge while playing and instrument or singing. While players using the guitar controller are responsible for playing the rhythms and/or pitches indicated on the screen, they are unable to manipulate or change any of these elements outside the realm of the game. Due to the pre-recorded nature of the instrumental/vocal tracks heard through the speakers, players can get a false sense of performing music due to the sounds of the music and band, the sounds of the simulated crowd and the fact they are playing a simplified form of on-screen notation. In some cases, players could think that they are responsible for the refined professional sounds heard through the speakers. The developers of *Guitar Hero* created this game with the intention of producing a type of rock or performance simulator, ‘bringing people the feeling of playing music’ (Miller 2009, p. 412). This form of performance simulation would bring an element of fantasy to the game, similar to other video games. This is potentially why music games are so popular: a player can pretend that they are part of a rock band on stage without having to leave the comfort of their home, or even having to practice a real instrument.

The microphone and the drum controller could be considered the only way a player could truly perform. When a player uses the microphone, they are reading a type of graphic notation while listening to the song, and it is only the voice of the player that is heard and amplified through the speakers. The drum controller is very similar in shape and playing style to a real drum kit. The player uses sticks to hit four different
drum pads, and uses their foot on a pedal to represent playing the bass drum. If a person is playing the on-screen notation correctly, the correct rhythm can be heard through the speakers, similar to a person playing on an electric drum kit. Additionally, a player can improvise rhythmic fillers without penalty as long as it does not interrupt the on-screen notation.

**Potential for Developing Musicianship**

This section discusses how the five types of musical knowledge relate directly to the games. A player's formal knowledge plays a large role in understanding how to play the game and use the composing program *GH Mix*. Players of *Guitar Hero* and *Rock Band* would need to understand how to decode the on-screen notation into the pitch and rhythmic elements and apply it to their instrument controller. Additionally, formal knowledge would play an important role in understanding how to use the different features of the composing tool in terms of the function of each instrument within a band and changing rhythmic and pitch figures.

Informal knowledge is one of the main types of knowledge that encompasses playing the game. As with most games, gaming takes place in an informal leaning environment (Moline 2010). According to Elliott (1995), informal knowledge is about reflecting critically in action. As the songs in the game are very linear in content, players would have to play a song the same exact way they did before. Informal knowledge would play an important role in playing on harder levels of difficulty as the player would have an informal sense of how the song went when they played it previously and use that knowledge to play the more complex notation.

Players need to use their supervisory knowledge in order be successful at the game. This would require players to problem solve, strategise and creating goals through playing the game or composing using *GH Mix*. For example, players may need to use the practice feature provided by the games, in order to practice playing difficult passages in some of the songs. This would involve players exploring the most efficient fingering, strumming or stick patterns or establishing where in the song they can use their *Star Power/Overdrive power* (a feature of *Guitar Hero* and *Rock Band* that allows players to play through sections without penalty).
The choices that each player makes within the game can be attributed to their impressionistic knowledge. This can relate to the compositional choices made by the player (e.g. the style of music chosen), or even related to the instrument they choose to play. Additionally this could impact the level of difficulty the player wishes to play.

Procedural knowledge is the combination of all these forms of knowledge, including creating quality sounds through playing their instrument or singing (Elliott 1995). The microphone controller would be the only controller in the game where a player would need to use their procedural knowledge to play the game, as the quality sound is directly related to the player singing in tune. The player is responsible for playing in time and pressing/hitting the correct buttons/pads on the other two controllers, but they are not responsible for creating a quality sound.

**Potential to Meet Syllabus Outcomes**

The games *Guitar Hero* and *Rock Band* have the potential to teach some of the concepts of music included in the NSW BOS Year 7-10 Music Syllabus (2003) through the various learning experiences.

**Composing**

Within the NSW BOS Year 7-10 Music Syllabus (2003), students are taught to compose music through the organisation and arrangement of sound using traditional and non-traditional notation and are encouraged to experiment with different forms of technology throughout the composition process (Board of Studies NSW 2003). The composing program *GH Mix* would meet the syllabus outcomes for composing using non-traditional notation, as *Guitar Hero* notation still incorporates some of the musical concepts as described in Table 2.4 in terms of pitch and duration. Furthermore, composing using *GH Mix* and the *Guitar Hero* guitar controller would provide a different and distinct type of technology for students to use and the potential to teach students many of the elements found within the NSW Music Syllabus (2003).
There are some limits to the Stage 4 outcomes that GH Mix could cover. First, the NSW BOS Year 7-10 Music Syllabus (2003) indicates that students should explore composing through improvising and arranging. Due to the linear nature of the program, improvising would be impossible as the players are not able to play the instrument controllers outside of the scope of the game. Second, the syllabus states that students should develop their composing skills through both individual and group work. Composing in groups could be possible but difficult, as only one instrument controller can be used at a time. Additionally, the program does not allow a player to record a vocal track within their composition limiting what controllers the player can use.

**Listening**

Listening is one of the foundations of music education in New South Wales. In music classrooms students are encouraged to listen, understand and respond to a wide range of musical styles, periods and genres (Board of Studies NSW 2003). Listening is an important skill required to play Guitar Hero and Rock Band. A player is required to listen to the music in the game in order to play the on-screen notation at the correct time (duration), understand the different pitch levels in relation to the coloured buttons (pitch), and respond to structural changes in the songs (structure). Additionally, the game could develop a player's ability to discriminate between sounds heard in a song by aurally recognising which instrument they are playing (tone colour). The games can expose students to the concepts of music through an appropriate instructional approach, even if all the concepts of music are not present in the notation.
Table 2.4. *Comparing the aspects of duration and pitch to the features displayed in Guitar Hero and Rock Band*

<table>
<thead>
<tr>
<th>Concept of Music</th>
<th>NSW Music Syllabus Definition</th>
<th>Concepts related to <em>Guitar Hero and Rock Band</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Duration</strong></td>
<td>Duration refers to the lengths of sounds and silences in music and includes the aspects of beat, rhythm, metre, tempo, pulse rates and absence of pulse.</td>
<td>Beat, Tempo &amp; Pulse</td>
</tr>
</tbody>
</table>
|                  |                               | • The use of horizontal lines that scroll down the screen in between the coloured notation.  
|                  |                               | • The distance between the lines and the speed in which they descend.  
|                  |                               | Rhythm & Metre |
|                  |                               | • The various groupings of coloured notation.  
|                  |                               | • A longer sound represented by a coloured note with a connected line behind it.  
| **Pitch**        | Pitch refers to the relative highness and lowness of sounds. Important aspects include high, low, higher and lower pitches, direction of pitch movement, melody, harmony, indefinite and definite pitch. | Highness & Lowness of Sound |
|                  |                               | • Related to the order of the coloured notes (See Figure 2.3).  
|                  |                               | Melody |
|                  |                               | • The succession of single coloured notes.  
|                  |                               | Harmony/Chords/Chord Progressions |
|                  |                               | • The use of two or more coloured notes played at the same time.  

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Performing

Performance is one of the most limiting learning experiences within *Guitar Hero* and *Rock Band*. According to the NSW BOS Year 7-10 Music Syllabus (2003), performance is characterised "as a means for self-expression, interpreting musical symbols and developing solo and/or ensemble techniques" (p.11) and encompasses three different learning outcomes: 1) performs in a range of musical styles demonstrating an understanding of musical concepts, 2) performs music using different forms of notation and different types of technology across a broad range of musical styles, and 3) performs music demonstrating solo and/or ensemble awareness. Self-expression is a very subjective term, however the syllabus defines it as the expression of emotion, imagination, ideas and experiences.

It is possible that those who use the drum and microphone controller could meet the first two outcomes as they would need to understand the concepts of music such as pitch and duration in order to accurately play the game, they would be performing using a different form of notation, and playing in a specific style of music. However, the guitar controller would not satisfy any of the outcomes, or even satisfy definition of performance, as the player is not directly responsible for the guitar sounds heard through the speakers. The third outcome (ensemble/solo awareness) would be difficult to teach using any of the instrument controllers as often it requires the players to be able to start/stop, slow down, speed up, get louder, etc. which is impossible within the parameters of the game. Due to the limited nature of the game, and due to the fact that this game is a performance simulation it is believed that this game would not be as effective to teach performance as getting students to use authentic instruments.

### 2.3.5 Summary

This analysis suggests it is possible for music gaming using *Guitar Hero* and *Rock Band* to develop aspects of a player's musicianship either through a formal or informal learning environment. However, it has also suggested that these games may have limited potential to teach the outcomes of the syllabus and may pose significant challenges if incorporating into school music education. Some of these features include teaching students to compose through using the composition program *GH Mix* or conducting listening exercises through the songs included in the game. However,
the analysis suggests there may be many aspects of these games that do not belong in a classroom, such as using the game to teach students to perform on plastic instruments or the style of notation used for the guitar controller. Students need to use a technology that allows them to demonstrate and further develop their skills in music. Using a plastic guitar controller or studying the guitar controller on-screen notation would teach students limited concepts and skills that could not be further developed past the game.

This analysis provided suggests that the educational use of music games might be possible, but little is known about how students perceive the musical concepts in the game, whether they can learn these concepts by playing the game, or whether a student's musicianship can be developed. It is also unclear whether the levels of engagement players have when playing these games outside the classroom would be similar if placed into the context of a music classroom. Further research examining what adolescents are experiencing when playing these games, will provide an initial step in determining whether these games do belong within an educational context, or whether there are features of the games could be included to create a more engaging music education experiences.

2.4 Conclusion

This chapter discussed current research in the field of music education and music gaming in two parts. The first part presented the importance of The Arts in education and examined research into the use of technology in music education, music gaming and music gaming in education. The second part of the chapter presented an analysis comparing Guitar Hero and Rock Band to the NSW BOS Year 7-10 Music Syllabus (2003) and Elliott's theory of musicianship (1995). The literature review suggests that there is a gap in understanding what adolescents are experiencing and learning musically when playing music games. However, the comparative analysis of Guitar Hero and Rock Band suggests that players of these music games can develop and demonstrate their understanding of some of the concepts of music and develop some of their musicianship. Therefore this current study was conducted to examine what the participants were experiencing when playing music games, and to determine whether
they were able to develop their musicianship and demonstrate their understanding with the concepts of music (Board of Studies NSW 2003). The next chapter describes the research design and methodology of this study.
Chapter 3: Methodology

3.1 Introduction

This study investigated the experiences of adolescents playing music games like Guitar Hero and Rock Band. The following research questions guided the investigation:

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 does engaging with these games provide?

The chapter will describe how the methodology addresses the research questions through the following sections: the research design, theoretical framework, research context, participants, data collection, data analysis methods and ethical considerations.

3.2 Research Design

The researcher used a qualitative approach and a phenomenological design for this study. The following sections describe the key features of qualitative and phenomenological research and explain why these were appropriate to the study.

3.2.1 Qualitative Approach

This study examined adolescents’ experiences with music gaming. A qualitative approach is best suited for exploratory studies, which seeks to make sense of social phenomena as it occurs in its natural setting (Stake 2005). Qualitative studies involve detailed descriptions of specific phenomena and explore how people think and experience their lives (Denzin & Lincoln 2000). There is some contention as to the exact definition of qualitative research due to the variety of meanings presented in the literature. Therefore, this section will explain the researcher’s approach by looking at
the key features of qualitative research and how they are appropriate to answering the research questions of the current study.

Qualitative research is an umbrella term used to describe a variety of approaches to inquiry (Creswell 2007; Merriam 1998). Under this umbrella are a number of common features. Conducting research in the field in which the participants experience the problem, issue or phenomena is one of the naturalistic features of qualitative research (Creswell 2007; Bogdan & Biklen 2003). This gives researchers the opportunity to speak directly with the participants, observe behaviour and collect data within the same context that the phenomenon is taking place, which may not otherwise be possible within a laboratory (Creswell 2007). As the data was collected within the context of where the gameplay takes place, the analysis often includes the "voices" of the participants (Denzin & Lincoln 1998).

Qualitative research also embraces the idea of multiple realities (Creswell 2007). Participants and researchers bring their own interpretations of reality to the problem or issue being studied. Therefore, it is important within the qualitative tradition, that the meaning the participants bring to the study be conveyed and explored in detail, as qualitative research is about “attempting to make sense of, or interpret phenomena in terms of the meanings people bring to them” (Denzin & Lincoln 1998, p.3).

Another key feature of qualitative studies is that the researcher is the main instrument for data collection (Merriam 1998). Qualitative researchers gather, examine and analyse multiple sources of data including observations, interviews, and documents (Denzin & Lincoln 1998). Researchers tend to use inductive reasoning as a method for data analysis, by developing themes and categories from patterns in the data. These themes often allow for different interpretations of the data by the reader and the researcher through the use of rich descriptions (Holliday 2007; Silverman 2001).

Conducting this study in a natural setting provided data about the phenomenon being studied, as most of the participants play Guitar Hero and Rock Band within the context of their home. This naturalistic model allowed the participants to convey their experiences and perceptions of reality within the site the game is being played. This enabled the researcher to make observations about the context in which the game is
being played. This is used in phenomenological research to explain how the context influenced the experiences of the research participants (Creswell 2007).

The researcher was a key instrument for data collection, collecting data through observations and interviews. By collecting multiple sources of data, the researcher was able to better understand and explain the descriptions given by the participants by drawing upon observations of the participant's physical cues and the context in which the participants played the game.

There is little existing research in the field of music gaming; therefore an exploratory study that focused on a complex, detailed understanding of the phenomenon was essential. The current research project aimed to understand the phenomenon of music games through an analysis of the meaning participant’s bring to playing Guitar Hero and Rock Band. Additionally, the researcher aimed to understand how these meanings had broader implications to other educational contexts by determining how they related to Elliott's theory of Musicianship (1995) and the New South Wales Board of Studies Year 7-10 Music Syllabus (2003). As this research project was the first of its kind, the emergent nature of qualitative research allowed the study to develop naturally by addressing the research to obtain the participant’s meaning. Within the qualitative paradigm, this study adopted a phenomenological approach.

3.2.2 Phenomenology

Phenomenology is an approach within the qualitative paradigm, which aims to explain experiences from the perspective of those being studied (Creswell 2007). This type of methodology attempts to describe what all the participants within a study have in common while they are experiencing a specific phenomenon (Creswell 2007). The basic purpose of phenomenology is to condense the individual experiences of the participants into central themes (Moran 2000). Phenomenological studies offer an insight into specific phenomena within a real life situation (Hammond, Howarth & Keat 1991). Additionally, phenomenological studies provide a deep understanding of the subjective experience as well as "gaining insights into people's motivations and actions, and cutting through the clutter of taken-for-granted assumptions and conventional wisdom" (Lester 1999, p. 1).
A phenomenological study can be the basis for further research in this field. Given that there is little prior research completed on the topic of music gaming (Miller 2009; Arsenault 2008; Missingham 2007), phenomenology offered a basis for new research in this topic area. A methodology that examines the entire human experience is important as it gives "an in-depth understanding of the nature and meaning of [the] everyday experience" (Gibson & Hanes 2003, p. 182). Additionally, a phenomenological design allowed the researcher to study the common meanings the participants brought to playing the Guitar Hero and Rock Band games.

A phenomenological design fit the research questions guiding the study. It examined the relationship between the phenomenon of music gameplay by adolescents and what adolescents experience when engaging with these types of music games. This was completed by analysing the common experiences as described by the research participants.

It is important in phenomenological research to establish and maintain a rapport with participants, as it aids in gaining in-depth descriptions (Lester 1999). During each interview, and in the presence of a parent or guardian, the researcher observed the participants playing the Rock Band or Guitar Hero game. The purpose of this was threefold. Firstly, spending time with the participants enabled the researcher to gain greater insights into the dynamics of their home environment, as well as interactions with their family and/or peers. This was important within the phenomenological design as the context in which the phenomenon takes place can influence how the phenomenon is experienced (Creswell 2007). Secondly, engaging in the game during the interviews gave the participants a chance to be in the mindset for talking about the game. Thirdly, it enabled the researcher to develop a rapport with the participants, making the interview process more comfortable for the participant, their family and the researcher.

3.2.3 Subjectivities

A statement of the researcher's experience is an important aspect of a phenomenological study (Creswell 2007; Moran 2000). These experiences can affect the way in which the phenomenon is perceived, studied and analysed by the researcher (Creswell 2007; Moran 2000; Hammond, Howarth & Keat 1991). For this
reason, specific experiences and perceptions on the part of the researcher in terms of music and gameplay will be highlighted as to their possible effect on the data collection and data analysis process.

The researcher has had approximately twenty years of musical training. This training consisted of private lessons on various musical instruments, music theory and aural training, as well as music teacher education training. These experiences gave the researcher significant knowledge of how music is composed, played and listened to. In addition, these experiences shaped the way in which the researcher perceives music through knowledge of how to read graphic & Western notation, being able to aurally recognising rhythmic & melodic patterns, as well being skilled in various playing techniques learned from music education training.

The researcher has also had over fifteen years of video gameplay experience, including six years experience with playing Guitar Hero and Rock Band. These experiences have shaped the way in which the researcher engages with video games through knowledge of various video game controllers, knowledge of the common objectives within video games as well as an understanding of the functions of video games. Due to the researcher's music education training, the researcher is able to understand and analyse the games in terms of musical concepts and elements.

3.3 Theoretical Framework

This study was informed by Elliot's Theory of Praxial Music Education (1995) and Bourdieu's Theory of Capital (1986).

3.3.1 Musicianship

Musicianship is a term used to describe the knowledge, actions and emotions as they relate to music. However, there is contention as to what constitutes musicianship or how students should develop musicianship within a music classroom. Therefore this section begins with comparing the various definitions and theories of musicianship of four leading educational theorists: Reimer (1989; 1970), Elliott (1995), Regelski (2005), and Swanwick (1988) in order to justify why Elliott's (1995) theory was chosen to guide the study.
Reimer (1970) contends that music education and musicianship should be taught through a type of aesthetic music education; an experience based philosophy that focuses on understanding music for its expressive and aesthetic qualities. Through aesthetic education, Reimer contends that "a work of art is a man-made thing, and its primary purpose is to be regarded for the aesthetic qualities it contains. The aesthetic qualities it captures can be regarded as a major reason for its being" (Reimer 1970, p.43). This philosophy further stipulates that teaching music for its aesthetic qualities can develop a student's perceptions of the world in terms of an aesthetic experience. This can help to bring meaningful experiences to ordinary experiences and thought (Reimer 1970).

Swanwick (1988) agrees with Reimer (1989) that music is an aesthetic experience, however he adds that it is necessary for children to first develop an understanding and mastery of musical sounds through concentrating on the sensory, expressive and structural elements of music (McCarthy 1991; Swanwick 1988). Swanwick's theory of musicianship and music education focuses on a child's overall development and mastery of music through three main musical elements: control of sound materials (e.g. through instruments or voice), understanding structural relationships (e.g. how music is composed, the intervallic distance between notes, etc.), and developing an expressive character (e.g. learning to be expressive through music). Additionally, Swanwick (1988) contends that as a child develops cognitively, they will learn to value music as an aesthetic art form.

Regelski (2005) challenges the theory of aesthetic music education, arguing that this philosophy often alienates students, as it does not take into account their thoughts, values and cultures. Additionally, he suggests that aesthetic education can be subjective in the styles of music studied, as people generally associate good quality music with what they enjoy (Regelski 2005). Instead, Regelski suggests that music education should focus more on 'doing music' through a variety of performing, composing and listening activities that can involve students of different musical levels and abilities. This form of *praxis* enables a continual development of musical understanding and curricula in conjunction with cultural and social contexts of the classroom.
Elliott (1995) agrees with Regelski that music education should focus on *praxis* rather than on the aesthetics. By doing so, it can create a more inclusive classroom environment by focusing on the 'lived experiences' of music through the medium of composing, performing and listening. Elliott (1995) developed his Theory of Praxial Music Education as a way to explain the multidimensional facets of music, musical understanding, musical values, and an approach to achieving those values. In order to achieve those values, a person must continually develop their musicianship.

Developing musicianship is the culmination of a person's musical knowledge, skills, thoughts and consciousness put into action (Elliott 1995).

These philosophies of music education suggest ways that students should learn, experience and participate in music. However, aesthetic music education (Reimer 1989) can be limited by what is considered aesthetically pleasing. Regelski's *praxis* (2005) is a more inclusive philosophy of music education, however it lacks precise definitions of musicianship and elements of music education. Therefore, Elliott's theory of music education and musicianship was chosen to inform this study due to the inclusive nature of the *praxis* as well as the clear and concise definitions of musicianship.

The term musicianship is used to describe the act of making music, which is made up of five forms of musical knowing: procedural, formal, informal, impressionistic, and supervisory knowledge (Elliott 1995). According to the theory, making music is essentially a matter of procedural knowledge in that musicianship is demonstrated through actions, not words. As musicianship is procedural in essence, the four other kinds of knowledge contribute to procedural knowledge.

**Procedural Knowledge**

All forms of musicianship are based on the procedure of making music (Elliott 1995). This means that when someone does something well in music it is manifested through their actions. For example, a student could demonstrate their understanding of various musical concepts within a piece of music by accurately applying them to playing their instrument. Elliott's theory of procedural musical knowledge focuses on the skill in which a person can apply the other four forms of knowledge (formal, informal, impressionistic and supervisory) to performing (or composing) in an effort to achieve
the highest possible quality as part of musicianship. His theory was used to observe
the degree to which the participants were able to apply the other forms of knowledge
to playing the game.

Players of *Rock Band* or *Guitar Hero* are challenged to complete the various elements
within the game, through accurately reading the in-game notation displayed on the
screen, understanding the rules of the game, and applying these concepts to the game
controller. The player is not directly responsible for creating the quality sound of the
guitar or drum kit heard through the television due to the fact that the sound is pre-
recorded (Miller 2009). However, in order to maintain the sound of the pre-recorded
instruments the player must understand how to accurately apply all the elements of
the game to the controller. Therefore this study examined three items in terms of
procedural knowledge. First, participants were interviewed to determine what prior
forms of knowledge the participants possessed when discussing the games in terms of
musical concepts, technical skills. Second, an examination about how the participants
were able to apply prior musical knowledge to playing the game through observations
was undertaken. Finally, the research observed to what ability level the participants
are able to apply their understanding of the game to the game controller.

**Formal Knowledge**

Formal knowledge includes knowing and understanding verbal and non-verbal facts,
concepts and theories related to music (Elliott 1995). In addition, ‘the
contextualization of formal knowledge enables students to convert formal musical
knowledge into musical knowing-in-action’ (Elliott 1995, p.61). It has been suggested
through an examination of *Guitar Hero* and *Rock Band* that rhythm and notation are
key elements of the game (Miller 2009), which represent aspects of formal knowledge
in music. Players must understand the on-screen notation, specifically how the
coloured notes represent the buttons to be pressed on the controller, including the
duration of each note. Furthermore, the player must also understand aspects of
structure. The practice feature of the game breaks down each of the songs into
structural elements, including introduction, verse and chorus. A player would need to
understand where these structural elements occur in the song in order to be successful
at the game. This current study interviewed the participants to determine what aspects
of formal knowledge participants are either bringing to, or learning from the game.
Informal Knowledge

According to the Praxial philosophy, informal musical knowledge is a type of practical common sense developed over time (Elliott 1995). This involves the ability to reflect critically in-action, which is dependent on knowing when and how to make musical judgements within a particular context (Elliott 1995). As with many video games, players use their developed informal knowledge through the other games they play (Annetta et al. 2009; Squire 2008). Players with prior musical experience also bring their informal musical knowledge to the context of playing Rock Band or Guitar Hero (Miller 2009). This can include recognising a particular style of music, which would allow the player to have an informal understanding song’s rhythmic or melodic structure. The way in which each participant responds to various parts of the game could relate to the experiences they bring. This was used in this study to establish whether there was a relationship between musical experience and playing Rock Band or Guitar Hero or whether informal musical knowledge was developed through playing the game. The researcher asked the participants questions regarding the types of music they chose to play, their understanding of the rules of the game, techniques developed, how they perceived the on-screen notation and how they played the game with others. Additionally, this aided the researcher in further describing how the participant's prior informal musical knowledge impacted what they experienced when playing the game.

Impressionistic Knowledge

Impressionistic knowledge is rooted in intuition and emotion (Elliott 1995), in that it relates to the emotions pertaining to each experience. Emotions can arise from personal knowledge and beliefs about people, events and even situations. In terms of musicianship, this can relate to how a person feels about a particular piece or genre of music, how they feel about a specific instrument or even how their feelings affect the manner in which they play a particular piece of music. As emotion and thought are interdependent, impressionistic knowledge helps musicians to reflect on their actions through the ability to make critical musical judgements in action (Elliott 1995). This study examined how the participants used their impressionistic knowledge throughout the game. The participants’ feelings needed to be taken into account as a part of their experiences (Elliott 1995), therefore the participants were asked about their choices as
it pertained to the songs they played, the level of difficulty they played the game, and the type(s) of instrument controller they frequently chose to use.

**Supervisory Musical Knowledge**

The ability to problem solve, strategize, plan and create goals are a part supervisory musical knowledge (Elliott 1995). It is a type of musical self-management, which is developed through formal or informal educational contexts ‘centered on musical actions, interactions and transactions with life-like musical challenges’ (Elliott 1995, p.67). This helped to inform the study by investigating how participants used their supervisory knowledge to problem solve and strategise when playing *Rock Band* or *Guitar Hero*. This included asking the participants about what personal strategies they used to improve at playing particular songs, the fingering patterns they used for difficult sections within a song, whether they used the games' practice feature and how they used the ‘star/overdrive power’ feature within the game. Star/Overdrive power is a feature within *Guitar Hero* and *Rock Band*, which allows the player to either gain additional points in the game or can prevent the player from failing the song for a limited time. Players need to think strategically when using the star/overdrive power in order to maximize their score (Miller 2009). This aspect of the Praxial theory (Elliott 1995) helped to develop an understanding of how participants approached the game, and whether the experiences as described by the participants were attributing to the development of their musicianship.

The research project aimed to understand whether the games could develop a player's musicianship through an understanding and application of musical concepts to the game. Additionally, this study aimed to examine the game from the teaching point of view in order to compare how the game could be used in an educational setting. Therefore, the NSW BOS Year 7-10 Music Syllabus (2003) was used as an analytical tool for understanding musicianship in terms of the concepts of music. However, as the data collection took place in the home-based environment in a naturalistic setting, the results may not be generalisable to a school based environment.

**Board of Studies and the Concepts of Music**

The NSW BOS Year 7-10 Music Syllabus (2003) divides the music program into two main areas: musical knowledge, and music skills. Through performing, composing
and listening activities, students are taught six concepts of music, which comprise: duration, pitch, dynamics and expressive techniques, tone colour, texture and structure (Board of Studies NSW 2003). Please refer to Table 2.3 for a description of the six concepts of music as defined by the NSW BOS Year 7-10 Music Syllabus (2003). Additionally, interview questions were formulated based on the criteria for performing, composing and listening activities (refer to Table 2.2 for a description of the learning experiences as defined by the NSW BOS Year 7-10 Music Syllabus (2003)).

3.3.2 Theory of Capital

Pierre Bourdieu developed social theories related to individual consciousness and the individual’s position within particular social structures (Grenfell 2008). Within his theories, Bourdieu suggested that an individual is a product of his or her social environment, meaning that the way an individual acts, feels and thinks (habitus) is attributed to the individual’s economic, social and cultural status and the individual’s position within society (field) (Reed-Danahay 2004). The research project focused on Bourdieu’s theory of capital as a way to understand and analyse some of the forms of knowledge, experience and understanding each participant brought to playing Guitar Hero and Rock Band and how these affected the way in which the participants perceived and played the game.

Capital is a type of social asset, which is inherited and continually developed and exchanged over the lifetime of the individual (Bourdieu 1986). Individuals can influence their position within a particular field with the capital they bring to the field (including economic, social, cultural and symbolic capital). Additionally, the field has the ability to develop particular types of capital. Players of Guitar Hero and Rock Band bring different capital to the game. An individual with prior knowledge and experience in music and/or gaming can impact their success in the game and what they learn from it. Their experiences playing the game individually or socially may also influence the ways they perceive and approach the game. By conceptualising the phenomenon in this way, the study took into account the perspectives the individuals
brought to playing game based on their prior knowledge and experience, and their dispositions and values.

Specifically, an individual’s musicianship (Elliott 1995) is a form of capital that can influence the way the game is played and perceived. The concepts of rhythm, metre, pitch, playing techniques and the ability to strategise have all previously discussed aspects of Guitar Hero and Rock Band (Miller 2009). The research project's main focus was to examine how music games impacted an adolescent's musicianship. However, there was also a small focus on examining how the participants' prior knowledge with music and gaming impacted their perception of the phenomenon. Additionally, this research project examined how the participants used their capital when playing the game, and attempted to determined how their capital was being developed and shared when playing the game with others. Therefore participants were asked questions about their social interactions with others while playing the game. Musicianship does not address interpersonal relationships as a means for developing knowledge and thought, rather it focuses on the single person's musical development. The theory of capital was used to address the gap in the theory of musicianship. Throughout the thesis the participants' prior knowledge and experience with music and games refers to music and gaming capital.

3.3 Participants

The researcher selected five participants to participate in the study, three boys and two girls. This study used purposeful sampling to select the five participants. Purposeful sampling is an approach researchers use to select specific individuals or sites that can inform an understanding of the research problem (Creswell 2007, 2005; Fraenkle & Wallen 2006; Charles & Mertler 2002). There are a number of different subcategories of purposeful sampling. For this study the researcher used criterion sampling, which is a method of choosing participants based on specific criterion (Miles & Huberman 1994). In phenomenological research, criterion sampling is best suited as it is important to choose participants who have all experienced the same phenomenon (Creswell 2007). Table 3.1 outlines the inclusion criteria for selecting the participants as well as the rationale for the criteria.
All of the participants recruited for the study were currently or previously enrolled in Stage 4 mandatory music during the course of data collection and owned a legal copy of *Rock Band* or *Guitar Hero*. Efforts were made to recruit participants with prior instrumental and/or vocal training, however it was not always possible. Table 3.2 introduces each of the participants, and provides details relating to their year at school and whether they were or had received private music lessons during the course of the study. Further detail about each of the participants is included in the results chapter.

### 3.3.1 Participant Recruitment

Two private schools were purposefully selected for the study as the researcher has prior relationships with members of the music faculties. Additionally these schools were selected due to their history of academic excellence and their diverse and gifted student population. After ethics approval was granted by the committee the researcher approached each school to recruit participants. A description of the method in which the participants were recruited will be discussed.

<table>
<thead>
<tr>
<th>Inclusion Criteria</th>
<th>Rationale</th>
</tr>
</thead>
</table>
| Adolescents aged 12-14 years | 1) By the age of 13, all adolescents are enrolled in the NSW Board of Studies Music Syllabus, Stage 4 mandatory music course and are continuing to develop the music concepts introduced in Stage 3. It was thought that adolescents within Stage 4 music are able to make connections to the concepts within the syllabus as they have been studying them for a number of years.  
2) When adolescents finish stage 4 (around the age of 14), they will have made the decision whether to continue their music education in Stage 5. Having all participants between the ages of 12-14 guaranteed that they will be engaged in music at school.  
3) It is likely that the participants in this age range will have reached a level of musical maturity, which allow them to make connections to their everyday musical experiences, and their school based musical experiences. |
Participants own legal copies of the game(s), game console(s) and game controller(s)

1) Assuring that each participant owns the game, game console and game controllers made it possible for the researcher to observe and interview the participants in the context in which the game was being played.

2) Verifying that each participant owns a legal copy of each game reduced the researcher’s exposure to criminal activity.

Adolescents who have had at least six months experience with playing the Guitar Hero and/or Rock Band games

1) Participants will have had direct experience with the phenomenon of music gaming.

2) Participants will have had enough time to get acquainted with the objectives of the game, how the game is played and how to use the various game controllers.

3) Participants were better equipped to describe their experiences with music gaming by having a minimum amount of knowledge, skill and understanding about the game(s).

Received or is currently receiving private instrumental or vocal training.

1) To examine whether there was any relationship between private musical training and participants’ experiences of the game.

2) It was thought that participants with musical training were more likely to be able to articulate their experiences with Guitar Hero in relation to their prior musical experiences.

Table 3.2. Description of the research participants’ education and music education background

<table>
<thead>
<tr>
<th>Participant Name</th>
<th>Year at School</th>
<th>Private music lessons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chris</td>
<td>7</td>
<td>Yes - Currently enrolled in drum lessons.</td>
</tr>
<tr>
<td>Tim</td>
<td>7</td>
<td>No</td>
</tr>
<tr>
<td>Terry</td>
<td>8</td>
<td>Yes - Currently enrolled in guitar and drum lessons.</td>
</tr>
<tr>
<td>Eva</td>
<td>8</td>
<td>Yes - Previously enrolled in cello and saxophone lessons.</td>
</tr>
<tr>
<td>Chelsea</td>
<td>7</td>
<td>Yes - Currently enrolled in piano lessons.</td>
</tr>
</tbody>
</table>
School #1

The school’s principal granted access to the school. Subsequently, the researcher approached the Year 7s and 8s during their Year meetings under the supervision of a schoolteacher. The researcher discussed with the students the research project, the requirements to participate in the project, the conditions in which the data collection would take place and the gift card that each participant would be given. After answering a number of questions from the students, the researcher distributed parent/guardian information sheets, consent forms and personal detail sheets to those who were interested in participating.

School #2

The researcher was granted access to the school by the deputy principal. Following, the researcher along with a schoolteacher went to various Year 7 and 8 classrooms to discuss the project with the students and hand out forms to those who were interested in participating.

3.4 Ethics

Before commencing the study, ethics approvals was obtained from the University of Wollongong (See Appendix B).

3.4.1 Minimisation of Risk

This study did not intend to judge any members agreeing to participate, instead the aim was to develop the body of knowledge of music gameplay, and contribute to the participants' understanding of their experiences. Participant information including background, viewpoints, and personal lives were treated with professionalism and sensitivity during the interviews and observations. All interviews & observations were located in the participant's household in the presence of their parents or guardians. The researcher confirmed prior to the interviews that the participants owned all the games and gaming consoles. This reduced the potential for the researcher to be exposed to illegal activity.
### 3.4.2 Informed Consent

All participants were be given an official University of Wollongong letter outlining the purpose and objectives of the study, as well as the expectations of the participants and the researcher. Written consent was obtained from both the participants and their parents/guardians, as all were under the age of 18. After receiving written consent, the researcher contacted the participant's parent/guardians to discuss access to the home; the structure of the interviews and observations; and any questions or concerns related to the study. During the course of the two interviews/observations, time was allotted for the participants and the parents/guardians to ask questions. Participants were made aware that their involvement in the study was completely voluntary and they were free to withdraw at anytime up to the point of the data collection being completed without consequence or penalty (see Appendix C for Consent Form, Appendix D for Participant Information Sheet, Appendix E for Parent Information Sheet and Appendix F for Personal Detail Sheet).

### 3.4.3 Anonymity, Confidentiality and Access to Information

All data collected from this study was only accessible to the researcher. Any forms of identification such as names, numbers, and addresses were removed from the data. In agreement with ethics regulations, upon completion of this study all data will be stored securely and only accessible by the researcher for a period of five years and then destroyed. Pseudonyms were used to identify the participants, family members and schools so that no person or institution was identifiable.

### 3.5 Data Collection

Within phenomenology, a number of different data collection methods can be undertaken in order to determine the entire essence of the experience (Creswell 2007). This study employed the use of two interviews with each participant; and observations by the researcher of how the participants played the game and the context in which the gameplay took place.
3.5.1 Interviews

The researcher conducted semi-structured interviews with the participants. Semi-structured interviews can provide greater breadth than the other types of interviews given its qualitative nature of questioning (Fontana & Frey 2000). Additionally, a semi-structured interview was chosen as it creates a personal affiliation with the participant, and intends to understand rather than explain (Denzin & Lincoln 2000). It is important within a phenomenological methodology to understand the participants' thoughts and feelings in order to best capture the essence of the experience (Moran 2000). All of the interviews were audio recorded using a portable media device. A decision was made not to video record the participants as this may have made the participants uncomfortable as well as limited the number of participants volunteering to participate in the study. The participants' responses aided the researcher in sufficiently determining whether the games could be used in a musical context.

The two interviews took place at the home of each participant over the span of three months. Most of the interviews were conducted in the same environment as the gameplay itself in order to have the participants in the mindset of the game. The participants' parents/guardians were located either in or just outside the area in which the interviews took place. Prior to the start of each interview the participants were allotted time to ask any questions about the research project, as well as to review the interview questions. As the interviews were audio recorded using a digital recorder, the participants were informed that only the researcher would be listening to the recordings and that their real names would not be used in any future publications. The duration of the first interview was approximately 40-50 minutes, and the second interview was approximately 30-40 minutes. Each interview had a specific purpose as to the information that was gathered.

The purpose of the initial interview was to gather general information about the participants' background with school, recreational activities, gaming and music. It was hoped that this information could be used to generate further questions that would best capture the participants' lived experiences with playing music games (see Appendix G for the list of interview questions). Additionally the research project wanted to determine how the participant's prior experiences with gaming and/or music influenced how they played, discussed and described the game. The interview
started with 15-20 minutes of general questions about the participant's school, and their previous experiences with music and games. The participants were then asked to play the game for a period of 5-10 minutes, while the researcher made observational notes that generated additional interview questions. Following playing the game, the researcher discussed the participants' experiences with playing Guitar Hero and Rock Band for a further 20-30 minutes. Most of the questions were intentionally open-ended in order to give the participants the opportunity to voice their own thoughts and opinions.

The purpose of the second interview was to gain further insights into the initial descriptions given by the participants, as well as to discuss how the games related to the concepts of music and learning experiences of the NSW BOS Year 7-10 Music Syllabus (2003). Following the first interview, the researcher transcribed the recorded interviews and analysed the data. A new set of semi-structured interview questions were then created for each participant based on the information provided in the first interview (See Appendix H for each participant's interview questions). Some interview questions were similar in nature due to the common themes that arose amongst all the participants in the first interview. The researcher began by first asking the participants questions about what had been happening in their lives since the last interview, as the researcher wanted the participants to feel comfortable prior to the start of the interview. Subsequently, the researcher asked the participants to elaborate on their previous responses. The researcher then moved on to discussing the participants’ experiences with: performing and listening when playing the game; song choices; and controller comparisons, which drew upon responses from their musical background in the first interview. These questions were to establish whether the participants could make any connections between their musical experiences and their experiences with playing the game, or whether their lived experiences with the game impacted their experiences with playing or listening to music.

During the final 5-10 minutes of the second interview, participants were asked to play a song they were unfamiliar with. The researcher took notes, and then asked the participants questions about their experiences when playing an unfamiliar song. The purpose of this was to see if the participants' described experiences with the game differed from their initial descriptions. This was an important data collection measure
as it was an assessment of the participant's level of procedural knowledge, music capital and gaming capital when playing the game. Playing an unfamiliar song, or sight-reading relies on a certain level of musical skill and knowledge. Additionally, it is the ability to fluently apply the skills and knowledge to a specific context (e.g. playing an instrument). The researcher wanted to examine the level of procedural knowledge, music capital and gaming capital for each participant when playing an unfamiliar song.

Conducting the interviews posed some challenges. Firstly, the researcher had to continually remind some of the participants that there were no correct answers to any of the interview questions, but rather the interviews were about discussing their experiences with playing *Guitar Hero* and *Rock Band*. Secondly, there was a recording device malfunction that deleted some interview data, and wasted time during one of the interviews.

**3.5.2 Observations**

The phenomenological method focuses on participants' perceptions of the experience (Creswell 2007). Therefore, it was relevant to passively observe the participants while they play the game. Passive observations are defined as when "the researcher is present but does not interact with the participants" (Mertens 2010, p. 382). Though observations are frequently used in qualitative research, they are not typically a part of phenomenological research (Merriam 1998). However, the observations can be a way for the researcher to observe "body language and other gestural cues that lend meaning to the words of the persons being interviewed" (Angrosino & Pérez 2000, p. 673). It was anticipated that observing the participants playing the game would prompt further research questions, which would give the researcher a better understanding of the lived experiences with music games that were described by the participants. In addition, it provided the researcher an opportunity to observe the participants interacting with the game within the context of their home environment.

The researcher passively observed the participants playing the games during both interviews. During this time, the researcher made notes about: what songs the participants chose to play; what level of difficulty the participants chose; what the participants were doing while playing the game, e.g. the participant's choice of
instrument controller; and playing techniques. The lack of video recording of the participants playing the game placed a limitation on the study by relying solely on the observational notes made by the researcher. Alternatively, the audio recording was the main source for data collection and analysis. These observations were used to generate additional interview questions during both interviews and throughout the process of data analysis. Additionally, observational notes were taken of where the game was played, as the context can influence how the participant experiences the phenomenon (Creswell 2007).

The lack of longitudinal observations placed a limitation on the study by being unable to assess the participants’ development of musicianship by playing the game. The researcher chose to conduct only two interview and observation sessions due to the limited time of the participants and the small scope of the research project.

3.6 Assessment of Quality

An assessment of quality of the research is important in order to establish whether the data obtained is trustworthy, and also if the research has used strategies for data collection and analysis. There are a number of different terminologies and methods in which the quality of a qualitative research project is evaluated (Creswell 2007). Often the concepts validity and reliability are associated with quantitative research, however the literature suggests that these terms should be revisited to better meet the standards and style of qualitative research (Creswell 2007; Merriam 1998). Creswell (2007) has addressed this by providing eight strategies to assess the quality and trustworthiness of qualitative research. These strategies include: prolonged engagement and persistent observation; triangulation using multiple data sources and methods; peer review or debriefing; negative case analysis; clarification of research bias; member checking; rich descriptions; and external audits. Creswell (2007) suggested that at researchers engage with at least two of these procedures within any given study.

This study used four of the strategies to assess the quality of the quality of the research. They are summarised in Table 3.3.
Table 3.3. Verification procedures used in the study

<table>
<thead>
<tr>
<th>Procedure Used</th>
<th>Procedure Details</th>
</tr>
</thead>
</table>
| Triangulation using multiple data sources to provide corroborating evidence | • Multiple sources of data were collected including interviews with the participants and observations of the participants playing the games.  
• These provided multiple sources of evidence to address and answer each of the research questions.                                                                                                                                                                                     |
| Peer review or debriefing to provide a external check of the research process | • The researcher consulted with several colleagues throughout the study, including the research supervisors                                                                                                                                                                                                                                   |
| Clarifying research bias from the outset of the study | • The researcher's bias was addressed in the research proposal prior to the start of this research project.                                                                                                                                                                                                                                           |
| Rich, thick descriptions which allows the readers to make decisions regarding transferability | • The researcher has provided rich and thick descriptions of the data collection and analysis methods.                                                                                                                                                                                                                                               |

3.7 Data Analysis

The interview transcript is the basis of the data in phenomenological studies, as it is through the participants' descriptions that the researcher is able to understand the essence of the phenomenon being studied (Creswell 2007). Before data analysis can proceed, the researcher must first electronically document all of the data. This includes typing up the field notes and observations, as well as transcribing recorded interviews verbatim (Corti & Thompson 2004). The data analysis steps presented in this chapter are based on those commonly found within phenomenological research (Creswell 2007).

The next step is for the researcher to describe their personal experiences with the phenomenon being studied (Creswell 2007). This includes a detailed account of how the researcher came to undertaking the study and specific experiences that relate to the phenomenon. This is a method of setting aside the researcher's personal experiences so that the focus is directed solely to the participants of the study (Moran 2000). Separating the researcher's experiences from the study can pose a challenge, as the researcher could become too separated from the text (van Manen 1990). However
the researcher can decide how and in what fashion their individual perceptions of the phenomenon will be introduced into the study (Creswell 2007).

The researcher then searches for and develops a list of significant statements from the participant's interviews (Moustakas 1994). These statements directly relate to how the participants experience the phenomenon being studied. Following, they are examined to ensure there is no overlapping or repetition among the participant's statements. While treating all of the statements equally the researcher combines them together to develop larger themes (Creswell 2007).

The next step is for the researcher to write individual descriptions of what each participant experienced with the phenomenon. Also known as the textural description in phenomenological data analysis, this includes verbatim examples from the participants' viewpoint (Moustakas 1994). The researcher then writes a structural description of the context in which the phenomenon took place, relying on observation field notes, and descriptions given by the participants (Creswell 2007). This information is used to indicate how the context influenced how the participants experienced the phenomenon.

The last step of data analysis is to use the textural and structural descriptions to write a composite description of the overall essence of the phenomenon (Pringle, Hendry & McLafferty 2011). This focuses on the common experiences of the participants, detailing 'what' and 'how' they experience the phenomenon. This information can be presented in tables, figures or in discussion (Creswell 2007).

These steps were used to complete an in-depth analysis of the data. First, an in-depth description of the researcher's experiences with the phenomenon was written prior to the start of data collection, and is presented earlier in this chapter. After the data was collected, the researcher personally transcribed the interviews verbatim and entered the observation field notes into a text document. By continually listening to each of the interview recordings the researcher was able to become especially familiar with the participants' responses. Additionally, this gave the researcher the opportunity to clarify any unclear or colloquial statements made by the participants by listening to the statements in the context of the conversation, listening to changes in the
participants' tone and making notes in the transcript. All of the interviews were re-checked for accuracy.

The order of analysis was modified from the steps normally taken in phenomenological research in order to best suit the study. After the first interview with each of the participants, the researcher transcribed the interviews. After the data from the first interview was read several times, the researcher made notes in the margins which highlighted any significant statements made by the participants. The researcher used the observation notes made by the researcher to help clarify any statements made by the participants. The researcher then developed a new set of interview questions for each participant, which clarified and elaborated on the descriptions made by the participants in the first interview. After the data was collected from the two interviews and both interviews and field notes were entered into the computer, the researcher then proceeded with analysing all of the data.

The researcher first started with reading each participant's first and second interviews separately while making notes in the margin. Noteworthy statements that described how the participants were experiencing the phenomenon where then highlighted. The culmination of the observational notes were used in conjunction with the interview transcripts to give context to the statements made by the participants when the participants provided physical examples to the research questions using the instrument controller. Additionally the researcher used the observational notes to examine how the participants were using the instrument controllers and how the context of the home environment may have impacted how the participants were experiencing the phenomenon of music gameplay. The researcher took these noteworthy statements and copied them to a text document while verifying that there were no repetitions in the statements. Following this, the researcher then colour coded the themes and placed them into three thematic groups: Music & Musicianship, Role Playing, and Social Gaming. Each of these themes were then analysed again searching for subthemes within the data (see Table 3.3). The remaining statements were highlighted and noted in a separate text document and then cross-checked against the three main themes, until none could be incorporated.

The researcher then wrote individual descriptions of the participants and how they experienced the phenomenon. This explained how the interviews progressed, a
detailed description of the participants and provided verbatim examples of significant statements made by the participants about their experiences with Guitar Hero and Rock Band. Using the observational notes, the researcher then wrote a description of the room in which the gameplay took place for each participant and wrote notes in the margin as to how the room may have impacted how they experienced playing the game.

Table 3.4. *An outline of the themes and subthemes that emerged from the results of the study*

<table>
<thead>
<tr>
<th>Theme 1: Music &amp; Musicianship</th>
<th>Theme 2: Role Playing</th>
<th>Theme 3: Social Gaming</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Concepts of Music</strong></td>
<td><strong>Instrumental Role Playing</strong></td>
<td><strong>Initial Game Usage</strong></td>
</tr>
<tr>
<td>• Duration</td>
<td>• Similarities</td>
<td>Social Gaming Practices</td>
</tr>
<tr>
<td>• Pitch</td>
<td>• Differences</td>
<td>• Gaming with Family</td>
</tr>
<tr>
<td>• Structure</td>
<td>• Affecting Instrument Choice</td>
<td>• Family versus Friends</td>
</tr>
<tr>
<td><strong>Song Choice</strong></td>
<td><strong>Rock Star Persona</strong></td>
<td></td>
</tr>
<tr>
<td>• Introduction to new songs and genres</td>
<td>• Performing</td>
<td></td>
</tr>
<tr>
<td>• Playing Familiar Songs</td>
<td>• Members of a Band</td>
<td></td>
</tr>
<tr>
<td>• Playing Unfamiliar Songs</td>
<td>• Being a Rock Star</td>
<td></td>
</tr>
<tr>
<td><strong>Musicianship</strong></td>
<td><strong>Personal Expression</strong></td>
<td></td>
</tr>
<tr>
<td>• Formal Knowledge</td>
<td>• Emotional Expression</td>
<td></td>
</tr>
<tr>
<td>• Informal Knowledge</td>
<td>• Musical Expression</td>
<td></td>
</tr>
<tr>
<td>• Impressionistic Knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Supervisory Knowledge</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

After all the data had been analysed and thematically grouped and the structural and textural descriptions were written, the researcher began with interpreting the data through drawing out the major themes and further analysing them. The researcher focused on the significant statements made by the participants, and began writing descriptions of how they related to each of the main themes. This is discussed further in Chapter 4. Following, the researcher began writing the overall essence of the
phenomenon, which focused on the common experiences of the participants. This is later discussed in Chapter 5.

### 3.8 Summary

This chapter discussed the purpose of the study, the research questions and the research design used to answer those questions. A description of Elliott's (1995) Musicianship and Bourdieu's Theory of Capital (1986) was provided, along with an explanation of how the theories aided in developing the study. This chapter also included a description of how the participants were recruited, the method of data collection and how the observations and interviews were conducted. Finally, this chapter illustrated how the data was analysed including an outline of the main themes from the data. The next chapter presents the results from the study, focusing on the themes and subthemes that emerged from the data.
Chapter 4: Results

This chapter presents the results of the study. It begins with a description detailing of each of the five participants and the interview locations, followed by presenting the common themes among the participants by drawing upon the interview data. Finally, the chapter will conclude with a discussion of the themes and their significance to the study.

4.1 Participants

This section presents a summary of the data collected from interviews with participants. Each participant is introduced by describing their background with music and music education; their families; their personal interests and hobbies; their initial experiences playing Guitar Hero and Rock Band; and the locations in which the gameplay and interviews took place. The first interview was guided by a semi-structured protocol comprising a set of questions asked of all participants. After transcribing this interview, the researcher analysed the data and constructed a further list of interview questions specific to each participant. These questions probed participants’ initial responses to best capture the essence of their experiences of playing music games. Additionally, as these were semi-structured interviews, some of the questions were formulated by the researcher during the course of each interview. A more detailed summary of each interview with the participants is located in Appendix I.

4.1.1 Chris

At the time of the study, Chris was a Year 7 student attending School #1. He came from a very musical family, which included his mother and uncle who were musicians. His sisters were also highly involved in both acting and singing. Due to his family's experience with music, he had been exposed to a range of different music genres from the 1950s to the present. He had a basic understanding of music theory and could read western music notation. Chris' video gaming experience was restricted to a limited number of games on the Nintendo Wii, the computer, and the Sony Playstation. His favourite video game was Grand Theft Auto.
Chris' interests at school included Art, Drama and Music and felt that he was able to express himself through these subjects. However he was not very interested in Mathematics, English and History subjects, explaining that they do not involve hands-on learning. Chris had been taking drum kit private lessons for less than a year at his school, but also played the guitar and bass guitar in his spare time at home.

Chris was first given Guitar Hero by his uncle in 2007 and played it frequently with his family and friends. His family hosted game nights during which they would play the game together. More recently, Chris played Guitar Hero very rarely, usually only when he had nothing else to do. According to Chris, this was because he played the game enough and would prefer to play outside with his friends.

The two interviews took place in a large multipurpose room comprising the entire bottom floor of the family home. A stage was set up on one side of the room, with a microphone, several electric and bass electric guitars, and a drum kit. Above the stage were a series of lights with a recording studio located adjacent with a computer and audio mixer. This area of the room was mainly used by the family to rehearse and record music and was where Chris practiced playing guitar and drums. At the opposite end of the room was a bar where the family would serve alcoholic drinks, and play an old pinball machine. The television and video gaming systems were placed in the centre of the room equipped with a Nintendo Wii, a Sony Playstation2 and several Guitar Hero and Rock Band instrument controllers.

4.1.2 Tim

Tim was a Year 7 boy from School #1. He was the only child in his family, which included a mother, step-father and father; Tim divided his time between living at his mother and father's house. Tim's musical experiences included school music class, and teaching himself songs on a school guitar. Additionally, he was able to play songs on the piano that he learned by ear (Crazy Frog and the Mission Impossible Theme). Tim had some experience with video games and video game design. He participated in design courses at the University of Wollongong (UOW) and at School #1. His favourite video games included Call of Duty (COD) and Grand Turismo. Tim's favourite subject at school was Technology, which included woodworking, computer technology and plastic modelling. He enjoyed music by Skrillex; a composer of
Dubstep music. Finally, Tim was an active participant in sport like surfing, and was a member of the Illawarra Hockey League.

Tim received *Guitar Hero: Warriors of Rock* from his mother in 2009 and used to play it very frequently. He described his playing patterns as erratic; he would play the game non-stop for two weeks and then not play it for a number of months. He believed this was because he was "rubbish" at certain songs in the game that would result in him losing interest in playing the game. When Tim first received the game from his mother, he frequently played it with his friends, however now they only played *COD*. Tim tried to persuade his mother to play *Guitar Hero* with him, however according to Tim she would make excuses not to play it. More recently, Tim only played the game when he was bored.

Tim enjoyed music, which was part of his daily life, however he did not seem to enjoy how he was being taught in music class. He referred to his teacher as teaching "old" forms of music. Tim further clarified that his teacher would spend too much time explaining concepts rather than letting the students explore them. He believed that *Guitar Hero* could give him the chance to explore some of the areas of music due to its engaging nature.

The two interviews took place in Tim's leisure area, where Tim completed his homework, watched movies, listened to music and played video games. This was not a private area as it is located adjacent to his mother's bedroom. The area was situated in the corner of the second floor. Two couches were at right angles to one another along the right wall, with a coffee table in the centre and the entertainment unit on the far wall. On top of the entertainment unit was a high definition (HD) television, as well as a sound system, a Blu-ray player, a *Playstation3*, and a *Playstation2* positioned underneath. To the right of the television is a stack of at least 15 video games. On top of the coffee table Tim had his laptop, *iPodtouch*, and an *iPhone*. Underneath the table was a remote control steering wheel, which Tim described as "top of the line" and "expensive" (Tim, Interview 1). This was used for some of his racing video games. The various *Guitar Hero* instrument controllers that consisted of a guitar controller, a drum controller and a microphone controller were placed around the leisure area.
4.1.3 Terry

Terry was a Year 8 boy from School #1. His family included a mother and a father, an older brother and a fraternal twin sister (also involved in the study). Terry's mother was a former psychologist, and his father was a musician (singer). In his spare time, Terry enjoyed long boarding, practicing parkour (a non-competitive outdoor physical activity where partitioners move from one place to another, negotiating between obstacles) with his older brother, playing video games and playing music. Terry was currently taking guitar lessons at his high school. Additionally, Terry had recently started drum lessons at School #1, as this was an interest for him. His favourite subjects in school included Art, Japanese and Music. Terry was not taking music at School #1 during the course of the interviews, however he did study music at his previous high school. He enjoyed alternative music by The John Butler Trio, Coldplay and Foo Fighters.

Terry's older brother purchased Guitar Hero in 2008. Terry heard about the game through his older brother, friends at school and through reviews of the game. Terry used to play the game for several hours each day. During the course of the interview he stated that he now played the game less frequently. When Terry played the game with his siblings, they would have to share a single guitar controller. When it was not his turn, Terry would either watch his siblings play the game, use the internet or get something to eat in the kitchen. Terry's parents had played the game infrequently. According to Terry, his older brother would often teach him strategies and techniques to play Guitar Hero.

Terry attended another high school before he went to School #1, where he studied music. Terry explained that he practiced playing his guitar during most classes, while his teacher would work with the other students who did not take private instrumental lessons.

The first interview took place in the family's living room where the family watched television and played video games. The second interview took place on the family's porch, just outside the living room. The living room was very spacious, clean and well organised. There were three couches in the living room, each on a wall positioned around the coffee table, which was located in between the couches with a high
definition television on top and an *Xbox 360* console located nearby. A *Guitar Hero* guitar controller was leaning against the television and five video games were placed on the television table. A closet to the left of the television contained three or four board games, a *Nintendo Wii*, and *Sony Playstation2*, which were packed away in their original boxes. On the couches were two laptops which Terry and his sister Eva used to complete their homework.

### 4.1.4 Eva

Eva was a Year 8 girl from School #2. Her family included a mother and a father, an older brother and a fraternal twin brother (Terry). Her favourite subjects at school included Art, Technology and English.

In addition to the number of video game consoles the family owns, Eva herself also owned a *Nintendo DS* and a *Playstation Portable (PSP)* and a laptop. Her favourite video game was *Little Big Planet*, which she played on her *PSP*. From time to time she also enjoys playing the game *Sing Star* on the family's *Playstation 2*.

Like Terry, Eva had heard about the game through their older brother. At first she would play it for about 30 minutes per day. Eva explained that more recently she would only play the game when she saw her brothers playing. When her siblings played the game as a family they had to share the single guitar controller. Similar to Terry, Eva also explained that her parents generally do not play *Guitar Hero*, however she explained it was because they were "too old". Additionally, Eva explained that her parents would normally play *Wii Sports* on the *Nintendo Wii*.

Eva last took music when she was in Year 7. When asked about the concepts of music she learned in school, she first had trouble remembering them, but later was able to describe them in detail. Eva made mention that due to her prior musical training on the cello and saxophone, she found music class "a bit boring" as the teacher went over material she already knew. However, she had many positive things to say about her music class.

Both interviews took place in the family's living room where the *Guitar Hero* was played. Since Eva and Terry are fraternal twin siblings and live in the same house, the description of the family's home and play area are located in Terry's section of the
results. Each interview occurred directly after the interview with Terry. Eva's mother stayed just outside in the kitchen listening to the interview.

4.1.5 Chelsea

Chelsea was a Year 7 girl at School #2. She came from a family of two brothers, a mother and a father. The parents were not musical, however Chelsea and her younger brother were both involved in musical activities. In her spare time she enjoyed reading, playing video games and listening to music. She had taken private piano lessons and music theory lessons for several years at a local music academy. She also took dance lessons at a local dance academy. Her favourite school subjects were History, Music and Math. She had a particular interest in the medieval period specifically the music and the clothing of the period. Chelsea had a lot of prior gaming experience. She enjoyed playing the games *Guitar Hero, Rock Band, Saints Row, Minecraft* (a popular online game) and *Wii Sports*.

Chelsea's parents purchased *Rock Band* along with a *Nintendo Wii* as a Christmas present for the family in 2008. Later, Chelsea's brother purchased an *X-box 360* along with the game *Guitar Hero: World Tour*. When the family first purchased the game Chelsea and her brothers would play the game together continuously. More recently, Chelsea and her brothers played less frequently, and often separately.

Chelsea enjoyed music class at her school, particularly singing and working on music theory work sheets that the teacher provided. Chelsea explained that she enjoyed working on worksheets because she already knew a lot of the material from her piano lessons and completing piano exams. She later added that she was interested in continuing her music studies at her school in Years 9 and 10. Throughout both interviews Chelsea was able to recall and explain many of the concepts of music she had learned in school, as well as apply them to the game.

The two interviews took place on the family's dining room table, opposite the area in which Chelsea and her brothers play video games. The researcher and participant moved into the room where Chelsea and her family play video games (video game room) during the two interviews to observe the participant playing *Guitar Hero*. The video game room was a very small, surrounded by bookshelves with books and magazines, a desk with computer equipment and a tall entertainment unit with an old
television. Underneath the entertainment unit were an X-Box 360 and a Nintendo Wii.

In the centre of the room were two wooden chairs and a computer chair, one for each of the three children in the home. Located next to the entertainment unit were functioning and non-functioning Guitar Hero and Rock Band instrument controllers. This area was only used for gaming.

4.2 Analysis of Themes

The following section presents the main themes identified from the participants' interviews. The data was thematically coded and three main themes arose from the data: Music & Musicianship, Role Playing and Social Gaming. Each of these themes will be presented by outlining the subthemes, followed by a detailed account of each of the subthemes.

4.2.1 Theme One: Music & Musicianship

Three subthemes emerged from the rich descriptions provided by the participants: concepts of music, song choice, and musicianship. This section presents each of the subthemes along with the voices of the participants, as well as interpretations by the researcher.

*Concepts of Music*

All five participants were able to relate their experiences of the game to musical concepts they had studied in or outside school. Duration, pitch and structure were discussed by all of the participants, whereas the other three concepts of music (tone colour, texture and dynamics & expressive techniques) were described by one of the participants. This could be because duration and pitch are the only two easily quantifiable concepts taught within the NSW BOS Year 7-10 Music Syllabus (2003), as they are not subjective or open to interpretation. Additionally, duration, pitch and structure are not open to interpretation as they are a set concept within the game, and cannot be changed. As the concepts of tone colour, texture and dynamics & expressive techniques were not discussed by all of the participants, they are not further discussed in this section of the results chapter.
Duration

When the participants were asked about what they were doing when they were playing the game, all mentioned listening to the beat, rhythm and/or tempo. Chris, Tim and Terry described listening to the music and tempo of a chosen song to predict what rhythms were to be played on the controller. Additionally, Chris would listen to the rhythm of the song to predict what sections were coming up, demonstrating the music concept of structure. When Terry was asked what he listened to, he explained that listening to the rhythm really helped him play the game:

I don't listen to [the pitch] much, I more listen to the rhythm. I don't listen to the pitch, sometimes I play it but I don't really know what I'm pressing. I get the notes but I don't know how I do it... When I'm playing the song and I'm just listening to the beat and rhythm sometimes I'm playing and I'm like "what the heck", because I don't realize that I'm playing it. (Terry, Interview 2)

Terry was referring to playing a song that he is very familiar with, and could not explain how he was able to unconsciously play some of the on-screen notation just by listening to the beat and rhythm. This was consistent with Terry's behaviour when playing the game, during which he watched the on-screen notation, but focused most of his attention on listening to the overall rhythmic elements of the song. The researcher observed Terry tapping his foot and moving his body in time to the music.

When Chelsea discussed the concept of duration (which she referred to it as rhythm), she was able to describe in detail how the game incorporated rhythmic elements within the game: "I think that...they might with semi-quavers, they might bunch [the on-screen notation] closely together. But the crotchets [are] just further away" (Chelsea, Interview 2). Chelsea was describing that the distance between the on-screen notation represented different rhythmic values in Western notation. Chelsea was able to conceptualise the game using music terminology she had learned through her prior music education, showing a different understanding to the other participants.

Participants frequently referred to two main aspects of duration during the interview: rhythm and beat. For example, Chris related his experiences when playing the game with the drum controller to his experiences of learning to play the drums in his private lessons. Chris demonstrated on his drum kit what he has learned in his drum lessons.
He was then able to describe how he applied this knowledge he had learned to understanding duration in the game. While playing the game on the drum controller, Chris often would add rhythmic elements not located in the on-screen notation, which he called 'fills'. This is a term used in drum set playing referring to the addition of rhythmic passages in between a main rhythmic phrase. He attributed this to his drum lessons, and explained how he applied it to the game: "I sort of learn the beat. It's not a matter of when you want to, it's a matter of where it goes" (Chris, Interview 1). Chris was explaining that he would play the fill where it suited best in time with the music.

Tim described how he would focus on elements of duration to play difficult passages in the game:

You keep it in a beat. So you think in your head, one, two, three, four, one, two, three, four. And then you know exactly when to hit [the note]. And also the lines that come down on the side, it shows at the end of each beat. (Tim, Interview 2)

Tim also explained how he would use his knowledge of the beat to get “back on track” if he made a mistake, using the same method of counting in his head to determine where he was in the song while looking at the screen. Tim often referred to “lines” or “bars” that were scrolling down the screen, explaining how these provided a visual cue for the main beats in a particular song.

There were, however, different interpretations among the participants about what the lines or bars represented. The researcher asked the participants specific questions about how they understood the visual interface of Guitar Hero (see Figure 2.3 for an example diagram of the visual interface of the guitar controller). Four out of the five participants made mention of a horizontal line or bar that streams down the screen in between the coloured dots. Two of the participants, Eva and Chelsea, thought that the distance between the lines indicated a different “speed” of the music, which is referred to as tempo in the NSW BOS Year 7-10 Music Syllabus (2003), an aspect of duration. Terry and Chris linked the horizontal lines to representing frets on a guitar as they viewed the visual interface of the controller as a direct representation of the guitar controller. However, Chris was unable to explain the purpose of the horizontal lines when he played the drum controller, when asked later in the first interview. Tim
had a different perspective, linking the horizontal lines to two main aspects of
duration in music as well as explaining when he knew to press the coloured buttons
on the controller: "That's each beat in a bar. So it's just like 4/4, it's like 1, 2, 3, 4 and
then it's a new bar... that's how I know to play each finger... I look at them and I'm
like '1, 2, 3, 4 bang'" (Tim, Interview 1). In this quote Tim is referring to the concepts
of beat and metre in his description of the horizontal lines.

Pitch

When the participants were asked about their perceptions of the coloured on-screen
notation, they described either a direct representation of the instrument controllers, or
related the concept of pitch. Terry and Tim described how the coloured on-screen
notation represented the physical coloured buttons on the guitar controller: "so if the
orange dot comes up [on the screen] you hit the orange [button] " (Terry, Interview
2). However, Eva, Chris and Chelsea described the coloured buttons in terms of
higher and lower sounds. Chris and Chelsea described how the buttons represented a
different pitch level:

You've got different colours and you've got different colours on [the instrument
controller] so once you hit [the] green [button] it makes the lower sound. (Chris,
Interview 2)

Yeah, because with the symbols like green, red, yellow, blue and the other colours,
it's showing that green's probably the lowest sound of the guitar and it just gets
higher as it gets to orange. (Chelsea, Interview 1)

Eva thought about the on-screen notation in a similar way, however she described
them as specific pitches and representing a specific finger pattern: "I think of it as A,
B, C, D because A I think of [the] red [button] and one" (Eva, Interview 1). When she
was referring to the number one, she was referring to her index finger. Eva had prior
private music lesson on both saxophone and cello. Often in instrumental playing,
fingers are numbered in order to help facilitate a finger pattern needed to play difficult
passages. This indicates how Eva linked her prior knowledge of instrumental playing
to playing the on-screen notation on the guitar controller.
**Structure**

The concept of structure was mentioned by the participants. All of the participants described in one way or another knowing the overall structure of a song when asked questions about what was enjoyable about playing familiar songs. Knowing the structure enabled them to anticipate what on-screen notation to play. Chelsea explained how the practice feature of the game allowed her to divide songs into sections. This allowed her to practice specific areas of a song that she could not play. Eva made specific reference to how her prior knowledge in music helped her to understand the structure of the songs in the game: "Because you could know that some songs repeat [sections] so you could know that the next part would be the same part as before... The chorus is like kind of the main part of the song and it repeats itself throughout the song" (Eva, Interview 2). Eva's understanding of structure helped her to anticipate similar sections and similar on-screen notation, which made it easier for her to play.

Tim demonstrated his understanding of structure through his composition using the *Guitar Hero* composition program *GH Mix*. The researcher observed that Tim had divided the song into three different main sections. Each section had different instrumentation, or a different focus on instrumentation. The first section had guitar, bass and drums playing throughout, whereas the middle section began with a timpani and cowbell solo, followed by the guitar and bass guitar. The final section ended with a solo guitar line, followed by a fury of percussion. This indicated that Tim understood how to compose the song into sections through the use of different instrumentation and melodic/rhythmic figures. Tim had later described that in some ways he was trying to mimic the style of *Dubstep* through the use of various percussion instruments.

**Song Choice**

Over the course of the two interviews each participant was asked about their choice of songs in the game, the songs they enjoyed playing and playing songs they were not familiar with. Three subthemes relating to song choice emerged: introduction to new songs and genres of music, playing familiar songs, and playing unfamiliar songs.
Introduction to new songs and genres

It was thought that the games might expose the participants to new styles and genres of music. And so, participants were asked questions about their favourite songs in the game. They were then asked whether they had heard the songs prior to playing Rock Band and/or Guitar Hero. Some of the participants had heard some of the songs listed in their copy of the game, however all of the participants mentioned that playing the game had introduced them to songs they had not heard before. As a consequence, the participants were introduced to older genres of rock music, often mentioning songs by Queen, Nickelback, Coldplay, The Killers and Metallica. Participants would often download the songs that they enjoyed, suggesting that the game can influence the participants' listening preferences.

Playing familiar songs

Participants were observed playing a familiar song during the first interview. By choosing a familiar song it was hoped that they would demonstrate their proficiency with the game. All five of the participants commented that playing a song that they are familiar with not only made the game more fun, but also made the game easier to play. Eva explained that she knew the structure of familiar songs: "Because you've got a sense of how you're going to play it and it's just easier because you just know... where the verse is and then you'll know when the chorus is coming up" (Eva, Interview 2).

Being familiar with a particular song was beneficial for Terry's playing. He explained that knowing the rhythm of the song allowed him to close his eyes while playing the game. This was important to Terry as it meant that he could be more involved in playing and listening to the song, rather than watching the screen. Furthermore, Terry and Tim indicated that being familiar with a particular song also allowed them to prepare mentally and physically for difficult passages and changes in the rhythm within the song. Tim referred to this as "getting used to something" (Tim, Interview 1). When asked what he meant, he elaborated that: "The beat, the rhythm, the feel of the music. So [the song] might be really quick so you'd have to play everything quick. Might be slow so you might have time to look up [at the screen], see what's coming then hit [the controller]" (Tim, Interview 2).
Chelsea would often sing the vocal part of songs that were familiar and that she enjoyed while playing on the guitar controller. For her, singing and playing added to her concentration: "I get in the zone when I sing and play at the same time" (Chelsea, Interview 2). Additionally singing while playing the game added to the realism of the game for Chelsea as if she was a "singer songwriter" (Chelsea, Interview 2).

Playing Unfamiliar Songs

As most participants tended to play songs with which they were most familiar, the researcher wanted to understand the participants' experiences with playing unfamiliar songs to see whether their experiences of the game changed. At the end of the second interview, four out of the five participants were asked to choose a song they were unfamiliar with and play it. Tim was not asked to play an unfamiliar song because the end of the interview was spent exploring the composition program GH Mix.

When describing their experiences of playing an unfamiliar song, participants described their attention shifting away from what they would normally focus on when playing a song. Their attention was no longer on listening to the overall song or the durational elements of the music, but on intently watching the on-screen notation or listening to the guitar part. This was due to the unfamiliar nature of the song, of not knowing what was going to come next. The participants had different reactions to playing something that was unknown to them. Terry and Eva described finding the rhythm difficult to follow. Chelsea and Terry described enjoying not knowing what was going to happen next. Chris was the only participant unable to finish playing his chosen song after two attempts. At the end of the second attempt he appeared frustrated with himself and the game, but he had progressed further than during his first attempt.

There was an observable difference in the participants' enjoyment of and engagement in playing familiar versus unfamiliar songs. Some of the participants did not like moving outside their "comfort zone" by playing songs they were unfamiliar with, but rather enjoyed playing what they knew.
Musicianship

This theme relates to the aspects of musicianship as described and demonstrated by the participants. As all the other forms of knowledge directly correlate to procedural knowledge through demonstrating their abilities in the game, this section will first discuss the formal, informal, impressionistic and supervisory forms of knowledge in turn, and then discuss how these contribute to procedural.

Formal Knowledge

Formal knowledge is defined as knowing and understanding verbal and non-verbal facts, concepts and theories related to music (Elliott 1995). Formal knowledge is gained through formal learning contexts like a classroom, however formal knowledge can be used in informal learning environments (Elliott 1995). The four participants who had received or were currently receiving private instrumental lessons described using the techniques that they learned in their private instrumental lessons to playing the game. For example, Chris described and demonstrated how he held the drumsticks while playing on the drum controller. Terry described how his guitar lessons taught him to better stretch his fingers in his left hand to efficiently hit the buttons on the guitar controller. Additionally, Terry's guitar lessons made alternating picking on the guitar controller easier. Eva's view was that her prior musical training gave her a better sense of musicality:

I think having past experiences in playing a musical instrument gives me a sense of musicality. And so to play the game it just helps... Like just the way when you listen to the music you can get a sense of where the next note would be I guess. (Eva, Interview 2)

Tim described the concepts of duration that he learned from his music class to playing the game. For example, Tim described how the lines in the game represented bars in music. He felt that focusing on elements of duration made it easier for him to play the game.
Informal Knowledge

Informal knowledge is defined as a type of practical common sense developed over time (Elliott 1995). Informal knowledge is gained through formal and informal learning contexts, as it is the ability of the person to problem-solve and strategise based on prior experiences (Elliott 1995). The participants described and demonstrated how *Guitar Hero* and/or *Rock Band* was developing their informal musical knowledge. This was initially evident when discussing what the participants found challenging about the game. The participants described that they found the harder levels of difficulty the most challenging because of the more complicated rhythms and the number of coloured buttons they were required to use simultaneously. Additionally, they explained how over time they had become better at playing the on-screen notation and using the instrument controllers allowing them to progress to the more difficult songs and higher levels of difficulty. For example, Chris and Terry explained that they developed a better alternate strumming technique from playing the game.

Chelsea described frequently using the practice feature of the game to help her complete songs she found difficult:

Well you can like break it down in parts because it asks you like what part you need help with and you can either have [the song] at really fast speeds and like you can slow it down as well. With *Raining Blood* I [can] get half way through the song now, instead of like just dying at the start. (Chelsea, Interview 1)

The researcher also observed that Chelsea positioned her left hand in the middle of the coloured buttons. When asked about this, she explained that this technique allowed her to easily press the right and left most buttons without shifting the entire position of her hand. This showed that Chelsea had learned and developed an informal technique to use the guitar controller through her experiences with playing the game.

Impressionistic Knowledge

Impressionistic knowledge is rooted in intuition and emotion, relating to the emotions pertaining to each experience (Elliott 1995). The game developed the participants'
impressionistic knowledge through the types of songs they chose to play, the instrument controllers they enjoyed using and the level of difficulty at which they chose to play a song. Tim, who owned all three instrument controllers, favoured using the guitar and microphone controller over the drum controller. He explained that this was because he found the drum controller difficult to use, and would sometimes accidently miss the drum pad and hit his hand. Eva and Chelsea both described how they enjoyed the physical nature of the drum controller because it made them feel as if they were rock performers. Chris described how using the drum controller allowed him to express himself by "free-styling" (Chris, Interview 2). He explained that there were sections of the songs where he felt that he could improvise and add fills. Terry described that a higher of difficulty made him feel that he was able to express himself, as it was similar to playing a real guitar: "Because it's more detailed and it sounds more to the music. And you feel like you're playing [the guitar controller] more" (Terry, Interview 2). Terry explained that the on-screen notation seemed to match the sounds of the guitar in the songs, which made him feel as if he was playing an authentic guitar.

Tim used his impressionistic knowledge to compose a piece of music using GH Mix. He described how he went about composing his piece of music, the instrument styles he chose and how he created the structure of the song. The researcher observed that the composition was influenced by Tim's love of Dubstep. Specifically, throughout the composition Tim included a dominant percussion and bass line and instrumental sound effects – a feature commonly found in Dubstep music. He later described his composition as "a bit like Dubstep really. Kind of like mad in every way" (Tim, Interview 2). This reflects Tim's earlier description of Dubstep as "mad", describing the random uses of sound effects throughout the style.

Supervisory Knowledge

Supervisory knowledge is defined as the ability to problem solve, strategise, plan and create goals (1995). This form of knowledge was only evident in observations made by the researcher and a discussion with Chelsea. All of the participants demonstrated use of their supervisory knowledge while playing an unfamiliar song. For example, some of the participants had difficulty playing the on-screen notation when the chorus first appeared. After the second and third repetitions of the chorus, the participants
had changed their left hand fingering patterns and right hand strumming patterns, so they were able to play that section more proficiently. Chelsea's normal gameplay demonstrated continual use and development of her supervisory knowledge to play the more difficult songs. She used the practice feature to problem solve technical sections, and relied on her brothers to provide some strategies. Chelsea was the only participant who actively used the practice feature. The other participants were aware of this feature in the game, but were not interested in using it.

Summary

The first theme presented three subthemes based on the descriptions provided by the participants. First, the participants related their previous musical experiences in and out of school to playing the game. Duration, pitch and structure as they related to the NSW BOS Music Syllabus (2003) were the main concepts of music described by the participants in relation to playing the game. All of the participants had discussed how the on-screen notation and the music in the game presented specific durational elements. This included listening to the main beat or tempo of a song (Tim and Terry), connecting the distance between the notes to specific rhythmic values (Chelsea), and connecting the lines that scroll down the screen to bars in Western music (Tim). The participants had also made connections with the guitar & microphone controller on-screen notation and high & low sounds or pitches. Finally the participants discussed how knowing the structure of a song made the songs easier to play, while Tim demonstrated many elements of structure in his GH Mix composition.

The participants discussed how their choice of songs impacted on how they enjoyed playing the game. The games introduced many of the participants to new songs and genres they had never heard before, some of which the participants listened to regularly on their portable media devices. The participants were also observed playing familiar and unfamiliar songs in order to examine their proficiency with the game. In general, the participants found it much easier (and enjoyable) to play songs with which they were familiar as they knew the song's overall structure and rhythm. However, the participants had different feelings and attitudes towards playing unfamiliar songs, finding it either frustrating or enjoying the challenge of not knowing what was going to happen.
Finally, the last subtheme related to the aspects of musicianship as described and demonstrated by the participants. The participants discussed and demonstrated their formal knowledge through the formal words they used to describe the game and the formal methods of using the instrument controllers. Through various experiences with playing the game over time, the participants had demonstrated their informal knowledge through the various playing techniques and their competency with playing on harder levels of difficulty. The participants' demonstrated their impressionistic knowledge through types of songs they chose to play, the instrument controllers they enjoyed using and the level of difficulty at which they chose to play a song. The participants had demonstrated while playing the game their ability to problem-solve and strategise as a part of supervisory knowledge. Furthermore, Chelsea was the only participant who had discussed using the practice feature of the game in order to play more difficult songs.

4.2.2 Theme two: Role-Playing

From the descriptions provided by the participants, the researcher was able to identify three subthemes associated with role-playing: Instrument Role-Playing, Rock Star Persona, and Personal Expression.

Instrument Role-Playing

The researcher asked the participants questions about playing the game *Rock Band* and/or *Guitar Hero*. As participants described playing the game, they often discussed how they viewed and used the instrument controllers. The participants made comparisons between the instrument controllers and authentic instruments by drawing on their prior knowledge and experience with music. Additionally, some of the participants discussed how the game influenced their motivation to play the authentic instrument. All five participants had access to the guitar controller, however only three out of the five participants had the drum controller and/or the microphone controller.

Similarities

Participants discussed similarities with the instrument controllers and authentic instruments in terms of the shape and method of using the controller. The strumming
button was the main feature of the guitar controller that participants described as the most realistic feature. Terry was the only participant who had received private guitar lessons. When asked whether he thought his guitar lessons had impacted the way he views and uses the guitar controller, he explained that his private instrumental lessons helped him to make sense of using his right and left hands simultaneously, as well as using an up and down stroke with the strumming button. Terry also compared a feature in the visual interface with frets on a guitar: "...there's only five notes there but it's like [the game developers] are trying to make it as realistic as possible. Like trying to play guitar I guess. So they get the frets" (Terry, Interview 1).

Chris described the coloured buttons on the guitar controller as representing notes in written music. When asked to clarify, he explained how the coloured buttons represented different parts of the guitar, as if they represented several pitches like on an authentic guitar. All the participants described the shape of the instrument controllers were representative of authentic instruments including the method of playing and holding the controllers. They made the connection between pressing a button on the guitar controller and pressing a finger down on the string of an authentic guitar, indicating that it was a similar technique. Chelsea described the guitar controller as feeling like an authentic guitar.

Differences

Participants were able to identify many differences between the instrument controllers and authentic instruments. Terry and Eva described a major difference in the number of possible notes on the guitar controller in comparison to an authentic guitar. Both participants explained that, despite having a similar shape to an authentic guitar, the buttons on the guitar controller do not accurately represent the number of possible pitches on an authentic guitar. Eva made a similar point: "... if you played [the guitar controller] and then wanted to start the guitar you'd know how to hold it but you wouldn't really know how to play it because [there are a] lot more different notes on a real guitar" (Eva, Interview 1). Tim stated that he did not feel like he was playing the guitar controller, because he could not hear the sound of the guitar on the audio track in the game.
Chelsea had also discovered that there was a significant difference between the guitar controller and an authentic guitar. She described the on-screen notation as representing the strings on an authentic guitar (even though the on-screen notation has only five strings, whereas an authentic guitar has six). She had also described how she memorised a section of one of her favourite songs and attempted to play it to an authentic guitar. She was unable to apply the skills that she learned from the game to an authentic guitar, noting that it "didn't really sound that good" (Chelsea, Interview 1).

Chris and Chelsea described noticeable differences in the drum controller in comparison to an authentic drum kit. Chris described that the position of the cymbals were incorrect explaining: "...this is actually the high hat (pointing at the upper left most drum pad) so the high hat is usually over there (pointing closer to himself on the left)" (Chris, Interview 1). Chris also mentioned a size difference between the controller and an authentic drum set. Chelsea had a different perspective; instead of making a comparison, she suggested that the developers of Guitar Hero and Rock Band could change the shape of the instrument controller to make it look more realistic. She explained that the cymbals could be made more round, and that the individual pads should be moveable to make room for extra drums.

Tim and Chelsea had both used the microphone controller. Both stated that of all of the controllers, this was the most realistic because their own voices could be heard through the speakers. The biggest difference highlighted by Tim was that players did not have to sing the lyrics but could make up the words as long as they sang at the correct pitch.

Impact on Instrument Choice

Terry and Chelsea both discussed how Guitar Hero was a factor in influencing their decision to play authentic instruments. Terry played Guitar Hero prior to starting private lessons on guitar. He explained that it was not only playing the game that impacted his choice to start lessons, but was also this idea of being part of a rock band which a main feature of the Guitar Hero game. Chelsea described how she had a fascination with playing the drums, but that this was increased since she started
playing *Guitar Hero* and *Rock Band*. She explained why the game affected her desire to play the drums:

...we got *Rock Band* for Christmas I think two years ago and it came with the drum set and I was like 'oh wow it's a drum set, I want to play it'... I think the drummer is an important part in the song because it's the bass and it shows the beats in it and it just sounds really cool in the background. (Chelsea, Interview 1)

*Rock Star Persona*

During the interview process participants were asked about what they felt like when they were playing the game. All of the participants described pretending to perform on stage, pretending to be part of a band, or pretending to be a rock star. In most of the cases this was dependant on either with who they were playing or who was in the room with them while playing the game.

**Performing**

Three participants described the game as providing a safe environment which was free from judgment and in which they did not have to worry about making mistakes. Tim described the game as giving him a unique performance opportunity: "It gives you a chance, you probably won't perform on a stage and if you get anything wrong you're not going to get heaps of bad press and get booed off stage. You're just going to like try again" (Tim, Interview 2). Those participants who imagined they were performing when playing the game were asked what elements of the game helped to facilitate this imaginary world. Eva described how the ability to see and hear the crowd made her feel like she was playing in front of an audience. Chelsea felt that not only the sound of the crowd made her feel like she was performing, but also the people in her environment. She described how she would often memorise sections of songs within the game and then ask her parents to watch her play while she looked away from the screen. Additionally, Chelsea would often sing the lyrics to the songs while she was playing on the guitar controller, which made her feel like a singer songwriter: "If I play [the song] a lot I probably get used to the words and I'll start singing. Like a singer song writer" (Chelsea, Interview 2).
Chris had a different view to the other participants because he had some prior experience of performing on stage. When asked whether he thought he was performing when playing Guitar Hero and Rock Band he stated, "I used to" (Chris, Interview 2). When asked to expand on his answer, Chris explained that his recent stage performances had dramatically changed his ideas about performing. He added: "The difference is, when you're actually performing there's a crowd. When you're performing on Rock Band or whatever there's none there... You get nervous when you actually perform...because there's people out there" (Chris, Interview 2). Furthermore, Chris explained that there was no stage and no real repercussions for missing a cue or note in the game.

Eva chose songs that made her feel like she was performing in a concert or show, especially songs that she described as 'big' or 'loud', like Rock Me Like a Hurricane by Scorpion (one of her favourite songs). She further explained that playing a song that she was familiar with contributed to the feeling of performing in a show because she did not have to focus on reading the on-screen notation and could focus more on the fantasy.

Members of a Band

Participants were asked about their experiences of playing Rock Band and/or Guitar Hero with family and friends. Chris, Eva and Chelsea described how playing with other people made them feel as if they were part of a famous rock band performing on stage. These participants described how the ability for each player to use a different instrument controller to play together and work towards the same goal of getting a high score added to this fantasy of being in a band. Chelsea further added that, for her, being part of a band in the game also helped develop a trusting relationship among the band members; that "...you can [help] people if they're failing [the song] " (Chelsea, Interview 2).

Eva described how when playing Rock Band with her friends, they would often focus on the fantasy element of the game. They would create a band name for themselves, as well as pretend to walk on stage together waving to the crowd. Eva was asked why being in a group made her feel more like a band and she said: "When you're in a group it kind of feels more like you're actually in a band. It's more realistic because
there's more people. You're all together doing it" (Eva, Interview 2). Pretending to be in a rock band made Eva feel famous and on stage, further explaining why this was important to her: "Because everyone knows me and then they know [me] for playing guitar" (Eva, Interview 2).

**Being A Rock Star**

Four out of the five participants talked about how the game made them feel famous rock stars. For some of the participants this was a result of the instrument controllers, for the others it was what they saw and heard through the television. Terry indicated that using whammy board made him feel more like a professional guitarist in that the action was similar to a whammy board on an authentic electric guitar. Eva explained that the drum controller made her feel like a famous drummer because she was able to use "real" drumsticks.

The audio and visual interface of the game made Tim feel like he was a rock star: "Just as it starts the song it shows all the crowd and you're up on stage and the lights flashing everywhere during the game and everyone else is playing and you're just rocking out" (Tim, Interview 2). Tim also explained that the visual interface also made him feel as if he was making a music video:

> Because you're basically looking up the guitar and in the background you've got video. So it's kind of like a video clip, making your own video clip it looks really cool...because you get to see what everyone else is doing. And also the crowd going berserk. (Tim, Interview 2)

Chelsea brought a different element of fantasy to playing the game. Frequently she chose songs that she not only enjoyed playing, but could also sing to. Singing while playing on the guitar controller made her feel like she was a "singer-song writer" on stage in front of a crowd, but she would not usually use the microphone controller with the guitar controller because making a mistake while playing or singing would affect her overall score.
**Personal Expression**

The participants frequently described how listening and playing music allowed them to personally express themselves. As a result, the researcher asked the participants if they were able to emotionally and musically express themselves while playing the games.

**Musical Expression**

Chris said he was able to express himself through "freestyling" (improvising) on the drum controller by adding drum fills within portions of the game. Chris was using knowledge that he had been learning from his private drum lessons. For him this was a type of musical expression that allowed to add rhythmic elements that were outside the scope of the game.

Terry described how the higher levels of difficulty within the game allowed him to be musically expressive. When asked why he felt this way, he stated: "Because [the on-screen notation is] more detailed. And you feel like you're playing [the guitar] more I think" (Terry, Interview 2). With the higher levels of difficulty in *Guitar Hero* and *Rock Band*, the on-screen notation is more directly related to the specific instrument heard through the speakers in terms of rhythmic and possible melodic elements. For Terry, the more realistic melodic and rhythmic elements makes him feel more like he is playing an actual guitar and in turn being more personally expressive.

**Emotional Expression**

Tim and Chelsea felt that the styles of songs they played allowed them to be emotionally expressive by eliciting an emotional reaction in them. Tim described when playing songs with a fast tempo he could "kind of party and put [the guitar controller] over your head " (Tim, Interview 2). Chelsea explained that she was able to be emotionally expressive through the use of the microphone controller as she was able to put "feeling" into the songs she sang. "you can sing [and] give feeling into the song so it's not just all like straight, dead, flat" (Chelsea, Interview 2). Chelsea was describing "feeling" as a type of dynamic phrasing in order to put emotions into a song.
**Summary**

Theme two presented data on the participants’ use of role playing while engaging with the games. The participants made comparisons with the instrument controllers, drawing on their previous experiences with playing authentic versions of the instruments. In most cases the participants had discussed many differences with the instrument controllers when compared to authentic instruments, however they found that the microphone controller was the most realistic. The participants also discussed experiencing elements of fantasy when playing the game. The participants had described how the sounds of the band and crowd and the game displays helped to facilitate their fantasy of performing on stage and pretending to be a rock star. Additionally, three of the participants discussed how playing the game with others made them feel as if they were a member of a rock band. Finally, the participants discussed how elements of the games allowed them to be musically and emotionally expressive. Chris and Terry discussed how the various levels of difficulty and the ability to improvise on the drum controller allowed them to be musically expressive. However, Tim and Chelsea discussed how the different styles of songs elicited different emotional reactions.

**4.2.3 Theme Three: Social Gaming**

Two common subthemes emerged from the participants’ descriptions of their experiences of playing *Rock Band* and/or *Guitar Hero* and other video games: Patterns of Use and Social Gaming Practices. Patterns of use included how the participants found out about the game and how often they use it. Social gaming practices included descriptions of how the participants played the game with their family (family gaming) and how this compared to playing with their friends (family vs. friends).

**Patterns of Use**

Participants were asked about how they discovered the game *Rock Band* and/or *Guitar Hero*, and how they obtained it. They were also asked how often they played the games and who they played with. All of the participants had found out about the game from television commercials or word of mouth. Chris, Chelsea and Tim had
asked for and received the game as a present from a family member. Eva and Terry's older brother had bought the game for himself and the family to use.

All five participants played the game frequently at first. In all cases participants described spending hours playing the game by themselves, and with friends or family members. For all the participants, this was a new type of technology that they had never experienced before, and a new way of social gaming. Chris described how his family would play the game together on weekends, each choosing a specific instrument to play. Eva and Terry described fighting over using the single instrument controller their family owned.

All of the participants had owned the game for at least two years. In each case, the participants described not playing the game as often by themselves or as a family. When playing the game years later, the participants explained that they would only play for approximately 20-30 minutes. Participants were asked the reasons why they did not play the game as often. Chris explained that he usually would only play by himself when he was bored or when his Uncle Bill, who bought him the game, would want to play it. Chris added, that he would much rather hang out with his friends or use Facebook in his free time. Eva explained that she never thought to play the game unless her brothers were playing it. However, Eva mentioned that she would often play the game Rock Band at her friend's house. When describing when he plays the game, Terry would always mention playing with his brother or sister and never about playing alone. Chelsea would often play the game either when she was bored, or when her younger brother Mark would ask her to play: "I think sometimes he gets a bit lonely and he wants to play with somebody" (Chelsea, Interview 2). Tim stated that he would often get very bored with the game and not play it for long periods of time.

With all of the participants, it seemed that they were no longer interested in playing the game by themselves unless they were bored or someone else wanted to play the game with them. This highlights a social element that makes the game interesting for the participants. Additionally, indicates that the motivation for playing the game was based on their desire to achieve their own personal level of mastery with the game. For example, Chelsea described working towards completing all the songs in the game and getting the highest possible score for each song: "I don't really like [getting]
three stars and I try to get up to four or five" (Chelsea, Interview 2). The game has a rating system that gives a player one to five stars, depending on the overall score achieved after completing the song. Chelsea's motivation for playing the game was based on her desire to complete each song with a high score. Terry's motivation for playing the game was to complete the fast songs: "[fast songs are] challenging. You need to hit the notes faster and your mind has to go quicker" (Terry, Interview 2). Eva and Chris described their motivation for playing the game was based on the desire to play the game with others. Whereas Tim described his own personal "checklist" (Tim, Interview 1) that he liked to complete when playing the game. Tim explained that this checklist consisted of completing each of the songs he enjoyed playing on each of the three instrument controllers he owned.

**Social Gaming Practices**

All of the participants had different gaming practices depending on whom they played with. There was variation in their specific goals during each gaming session, the instruments each person played, playing techniques, and group rules. In many of these circumstances the goals and rules were dependant on the type of capital that each participant, friend or family member brought to the game. The next section will discuss each of the participants and their gaming practices.

**Gaming with Family**

Four out of the five participants talked about playing the games with their family, which included their parents and/or siblings. In those cases, participants mentioned how the game provided a context for their family to socially interact. Gaming practices changed depending on who was playing the game within the family unit.

Terry and Eva are brother and sister and have only one guitar controller to share amongst the family. Both were asked to describe sharing the controller between them and their older brother, who played the game most often. Eva and Terry described the rules the family set for playing the game so to ensure equity. Each person would play one song before giving the guitar controller to the next player. However, even with the rules in place, arguments would still ensue as a result of Terry and/or Eva leaving the play area. Terry and Eva described getting into arguments over whether someone could retake their turn after failing to complete a song. Eva went further to explain
that if she left the play area, her brothers would either skip her turn or play more than one song without her knowing. Even though the rules were not always effective this social practice was created by the family to manage turn-taking and promote sharing.

Terry and Eva described different practices when waiting for their turn. When not playing the game, Terry would sit on the couch and watch his siblings play, or get something to eat. Eva would usually leave the room to do something else that interested her. The exception was staying to watch her older brother was play because he played the game on a harder difficulty setting and "there's lots of different notes and I like to see if he can get them all. It's really fast" (Eva, Interview 2). Eva and Terry both commented on enjoying watching their older brother play, expressing their admiration for what he was able to accomplish in the game.

Chelsea's family had different social gaming practices to the other participants. Chelsea and her brothers often played the game either by themselves or in a group. Each sibling had several instruments that they enjoyed using and they had a list of songs that they enjoyed playing together. Chelsea and her brothers did not only play the game only because for the enjoyment but also to achieve the highest possible score on each song. Chelsea described how she and her brothers had been trying to achieve "5 golden stars" for each song since their parents purchased the game, which meant that either by themselves or as a group they had to achieve a specific score for each song. Chelsea also described how her brothers would often help her with difficult parts of the game, either by playing the game for her or by providing her with strategies to play the game.

Playing Guitar Hero had been a bonding activity for Chelsea's family. She described how her younger brother would often try to take the guitar controller from her when she was playing the game by herself as an attempt to get her attention as he (according to Chelsea) often got lonely. The game has provided a new mutual interest between the two of them, allowing Chelsea and her little brother to interact together.

Chris' family were very interested in playing the game when the family first got it. He and his family held game nights during which they would sit around the television and play the game together. During that time, Chris explained that each family member had different instruments that they liked to play: "[Uncle] Bill plays guitar, I
play drums and guitar. Mom plays drums, Jennifer plays drums and guitar" (Chris, Interview 1). Chris went on to describe how his mother, uncle and sisters would often take turns using the microphone controller. Frequently, the family would choose songs that they all knew.

As mentioned earlier Chris' gaming practice evolved due to some of his recent performing experiences. Chris stated that these experiences greatly changed the way in which he viewed the game, no longer considering it performing, but rather just playing a game. Additionally, Chris demonstrated that he was using music capital (a type of asset) that he gained from his music lessons and applied it to the drum controller by adding fills to the Guitar Hero songs.

Tim was the only participant who did not play the game with his family, and very rarely with his friends. When Tim played Guitar Hero, he often played by himself in his own play area in his mother's home. He explained that he played the game, not only because he enjoyed video games, but also because it involved music. When he first received the game two years ago, his friends would come over play it with him. However, Tim explained that when his friends came over to his house they were now more interested in playing Call of Duty. Tim had often asked his mother to play Guitar Hero but he explained: "If I asked my mum right now if she can play, she'd go 'no, I'm doing something else right now', and then I'll find her two minutes later watching TV" (Tim, Interview 1).

Family Vs Friends

Terry and Eva mentioned different social gaming practices when not playing with their family. Terry enjoyed playing with his family more than his friends: "...because I think [I'm] more comfortable with my family so I feel like I can be my self more and myself more is challenging" (Terry, Interview 2). This suggested Terry was more self-conscience playing with his friends. Terry's older brother was skilled at the game, and Terry felt this pushed him to become better at the game.

Eva had the opportunity to play Rock Band with a group of her friends at a friend's house. They were all able to play the game at the same time, as her friend had all of the instrument controllers. This meant that the same rules that Eva had at home did not apply in the social situation. Instead, they focused more on the fantasy element to
the game. In this social situation Eva and her friends pretended that they were part of a band. They created a band name, and pretend they are performing in front of a large audience, which is aided by the sound of the audience provided by the game. Each person in the band had their own instrument controller that they play. Eva explained that she enjoyed pretending to be part of a band because it makes her feel famous: "it's like you're part of something that people know and appreciate and it's fun to play and be in a group and you're part of the group, you're important" (Eva, Interview 2). As Eva's family only had one controller, this was different to her experience playing at home with her family.

Chelsea also played the game differently with her friends than with her family. When her friends came to her house to play the game, Chelsea explained how they were not very good at the game, because they do not own a copy of their own. She went on to describe how she would often have to teach her friends how to play the game and at times used the coloured buttons while they strummed on the guitar controller. Because Chelsea's friends were not very familiar or skilled with playing the game, they would frequently lose interest and move on to something else.

Chris played the game more with his family than his friends. The last time he played the game with his friends was over a year ago. He explained that he and his friends preferred to go outside, rather than stay inside playing video games. However when he played the game with his friends they would play competitively. This differed to when he played the game with his family. Chris described how they would play the game cooperatively, acting as if they were a family band.

Tim had only played Guitar Hero with his friends. As mentioned earlier, he had asked his mother to play the game with him, but according to Tim she was not interested. Therefore no comparisons could be made between Tim's gaming practices with his friends and family.

Summary

Theme three focused on two subthemes as it related to social gaming. First, the analysis of this theme discussed the frequency in which the participants played the games Rock Band and Guitar Hero (Patterns of use). All of the participants had discussed playing the game frequently at first, but subsequently over time the amount
they played was dependant on who they could play the game with. Second, the analysis compared the participants' gaming practices with their families in comparison to their friends. Overall, the participants described rules and goals of gameplay when playing with their family members. Additionally, they discussed being more comfortable playing the games with their family members, which may have resulted in playing the game less with their friends. Eva was the only participant who had discussed specific fantasy elements when playing with her friends. This included taking on a rock star persona and creating a band name.

4.3 Discussion

The next section will discuss each of the main themes presented in the results chapter. It will include on the researcher's interpretations as they related to the themes; and comparison of features of the games Guitar Hero and Rock Band to the descriptions by the participants.

4.3.1 Theme One: Music & Musicianship

Concepts of Music

The participants alluded to three out of the six concepts of music as presented in the NSW BOS Year 7-10 Music syllabus (2003) when they were discussing their experiences with the game – pitch, duration and structure. The participants frequently alluded to these concepts while discussing other topics and ideas. For example, when discussing how knowing a song makes it helpful to play the game, Eva described concepts of structure, and was able to give some examples. However, when the participants were asked direct questions about how the concepts of music learned in music classes or private music lessons related to the game, they did not seem to understand. The researcher often needed to rephrase the question using less formal terms. This suggests that the participants did not know enough formal musical terminology to understand the questions. It may also indicate that the participants had an understanding of the formal elements of music, but the manifestations of the concepts in the game as discussed by the participants were seen as unconnected to their prior formal musical experiences. This suggests a potential disconnect between understanding a concept in a formal learning environment and applying it in an informal gaming environment.
The participants were easily able to identify elements of pitch, duration and structure:

**Pitch:** Pitch refers to the highness and lowness of sound (Board of Studies NSW 2003). All of the participants understood the guitar controller coloured on-screen notation as representing high versus low sounds. For example Chris and Terry discussed how the green button on the guitar controller represented a low sound where the orange button represented a high sound. As mentioned before, Eva discussed how she identified the coloured buttons as representing pitches like in Western notation. Although the participants recognised that the number of possible pitches with the guitar controller notation was limited, they were still able to identify basic elements of pitch within the game using their prior knowledge of music (music capital).

**Duration:** Duration is the length of sound and silences in music (Board of Studies NSW 2003). The participants were able to identify duration as the main concept in the game. They were able to describe the distances between the on-screen notation as representing different lengths of sounds, and were able to describe how the lines that scroll down the screen divide the on-screen notation into larger beat groupings. For example, Tim described the lines as representing bars in music; a formal element of duration that he learned from his music class. This suggests that since duration is a concept easily identified by the participants, these games could be used as a tool to demonstrate and apply a player's understanding of duration.

**Structure:** Structure refers to the form of music (Board of Studies NSW 2003). The participants were able to understand structure in terms of the popular music they listen to (informal knowledge), which is usually in a verse chorus form. They were able to hear the repetitions in the music and be able to understand what parts of the music they were playing. Additionally, the practice feature of the game also broke the songs down into these different sections, which could have influenced how the participants understood the songs in terms of structure. For example, Eva's ability to identify structural elements in the songs helped her to anticipate similar on-screen notation, which made it easier for her to play the game.

The games were designed to include many concepts of music. For example, all of the songs in the game are based on a form of musical structure. However, the participants'
level of interaction with the game affected their perception of the game. Chelsea was aware of the structural elements of some of the songs through the use of the practice feature, as she used this to improve at playing the game, however Chelsea was unable to change the structure of the songs she plays. Eva identified structural and pitch elements in the songs, however she did not discuss being able to manipulate any of these elements. The other three participants (Tim, Terry, and Chris) did not describe any type of structure with the game. This may be because they either did not perceive structure as being a major feature of the game, or that they did not have enough musical knowledge or developed music capital to identify or describe structural elements in the game. These examples demonstrate the participants had similar and different perceptions of the game. This suggests that the level of interaction with the game is directly correlated to the player's prior experiences (or capital) they bring to playing the game.

The games design incorporated the concepts of tone colour, dynamics and expressive techniques. Players are able to choose the instruments they play which relates to tone colour, and they are able to change the volume levels of the instruments in the settings menu which relates to dynamics. Additionally, use of the whammy bar is a way for the players to interact with expressive techniques. As the participants did not describe any of these concepts it could indicate that they need a higher level of musicianship and/or do not have enough musical knowledge or high enough music capital to understand the game in terms of specific concepts.

**Song Choices**

The participants described how song choice had affected their experience with the game. The participants chose songs that they were most familiar with rather than playing songs that they did not know. By playing a familiar song, they would know the overall structure of the song, the metre and the tempo rather than relying solely on the on-screen notation. The participants described that by playing a known song they could focus more on the fantasy element of the game by pretending that they are a rock performer on a stage. This experience is similar to being a performer playing an authentic instrument. Being familiar with the overall form and notation of a song can allow a performer to focus on more specific musical elements like phrasing or even playing techniques. Additionally, being familiar with a song can allow a performer to
focus on performing elements that can attract audiences to the music, such as clothing or stage presence. Although the participants were not responsible for the professional instrumental sound heard through the television speakers, playing a song that they were familiar with and enjoyed made the rock experience more real for them.

Playing an unknown song was a new learning experience for many of the participants. However, some of the participants did not enjoy the experience. This also could be attributed to the score based nature of the game. If a player was constantly making mistakes throughout the game, the sound that signifies that a mistake has been made can be not only distracting but can also make it difficult to get back into the correct part of the song. Learning to play unknown songs comfortably is only gained through experience and the development of a person's music capital. It is possible that more experience with playing unknown songs could make it easier and more enjoyable for participants and provide a new learning experience.

**Musicianship**

Participants demonstrated some formal, informal, impressionistic and supervisory knowledge from their experiences of playing the game. All of the participants seemed to have improved their informal knowledge through the various techniques developed on the instrument controllers, and a better understanding the on-screen notation. During the two interviews, the participants demonstrated aspects of supervisory knowledge through describing goals for themselves, such as surpassing each level of difficulty in the game. Prior musical knowledge (music capital) may have shaped the way that the participants played the game. For example, Chris, Terry, Eva and Chelsea were skilled at playing songs on at least a medium level of difficulty. These participants had received or were receiving private instrumental lessons. Since musicianship is about procedural knowledge (being able to demonstrate skill and musicianship through actions) (Elliott 1995), this suggests that the four participants may have been applying their previously learned procedural knowledge to playing the game. Tim's musicianship could have progressed at a much slower rate because his coordination and listening skills were less developed due to a lack of prior instruction in music performance. However, it is still unclear whether the game or having prior musical training played an important role in developing the participants' musicianship due to the lack of longitudinal data.
4.3.2 Theme Two: Role Playing

All of the participants in the study described a role-play element to the game. This included the instrument controllers, the visual and audio interface of the game, and the opportunity provided by the game to play with others. However, there was also a sense that the participants were able to separate the fantasy from the reality based on some of their previous experiences with music and musical instruments.

The participants were able to make comparisons between the instrument controllers and authentic instruments they had either used or seen played. They understood that using the instrument controllers was not the same as playing an authentic instrument. The participants mostly referred to the guitar controller, as this was the only instrument that all five participants owned and used. However, the drum and microphone controller seemed to be more realistic to those participants who owned them. This could be because when a person plays on the drum controller or sings through the microphone controller the sound heard through the speakers is a direct representation of what he or she does. This was evident when Chris added fills to the song he played on the drum controller. However Tim felt that the microphone controller was slightly unrealistic since players did not have to sing correct lyrics. Tim may be confusing the realism of the microphone controller and the rules of the game. The fact that a player could sing using the correct pitch displayed in the game but make up the lyrics could be a more realistic element of the game. It is possible that even though the participants realised that they were playing instrument controllers, it was still realistic to them, as they were responsible for the instrument sound in the game for those particular instruments. Additionally, the fact that Chelsea, Chris, Eva and Terry were influenced by the game to play authentic versions of these instruments indicates that the game may motivate a player to move out of the fantasy and into the reality of playing an authentic instrument.

The participants all discussed a type of persona that they adopted when they played the game. They all felt at one time or another that they were rock stars playing on a stage, which was influenced by the sounds of the crowd, the instrument controllers in their hand and at times the people around them. The positive side to this is that the players are able to feel empowered by imagining a reality where they are famous rock performers and good instrumentalists. The negative side to this is that the game is an
unrealistic representation of what it is like to perform on stage in front of a large number of people. It takes years of practice to play any of the instruments in a rock band to a professional level akin to what the participants hear from the game, and many different opportunities to perform to become accustomed to playing in front of an audience. As Chris was the only participant with extensive experiences with performing in front of large audiences, he came to understand that there was no comparison between playing the game, and playing in front of a large concert audience.

4.3.3 Theme Three: Social Gaming

The participants discussed their social interactions with their friends and family members while playing the Guitar Hero and Rock Band games. They also described how these social interactions influenced their experiences with the game. Because all the participants had owned the game for more than two years, the amount of time spent playing the game had greatly decreased. This could be due to the fact that the novelty of the game has worn off and no longer held much interest for them, or that they had achieved their own personal level of mastery with the game.

Family interactions developed the gaming and music capital of the participants. Capital was defined in this study as a type of social asset, which is inherited and continually developed and exchanged over the lifetime of the individual (Bourdieu 1986). Four out of the five participants (Chris, Terry, Eva and Chelsea) played the game with family members who influenced how the game was played and the level of difficulty attempted. For example, Chelsea and her brothers would play the game together and separately. Chelsea had described how her brothers would often help her with difficult sections in the game by offering her tips and strategies. She explained that she and her brothers would play the game at a hard to expert level of difficulty in order to achieve the highest score possible. Each time Chelsea's brothers helped her they were using their music capital to improve Chelsea's experience and meet her goals with the game. Terry also described how observing his brother playing the game would influence him to play songs on a higher level of difficulty. Chris playing the game with his family may have had to do with the family's mutual interest in music. All of these choices whether it was instrument or song, were greatly affected by the music capital each family member brought to the game. However, Chris was often
unable to make clear connections between playing the game and playing music possibly indicating that either he did not see any musical connections, or that he did not think about music in formal terms. These experiences suggest that social interactions and the exchange of music and gaming capital helped the participants become more skilled at playing the game, developed their understanding of the game, and helped to develop their social relationships with their friends and family.

Tim was the only participant without many opportunities to develop his social gaming capital. He had his own recreation room equipped with a television, gaming consoles, a stereo system and all of the gaming controllers. Besides previous experiences playing the game with his friends, Tim no longer played the game with others. This meant that he would rarely use all of the instrument controllers, as well as experience playing *Guitar Hero* with others, which meant that there was no one else to push him to play any other songs, or play the game at harder levels of difficulty. This could explain why he played the game at such a low level of difficulty than the other participants, only played a small selection of songs and mainly used the guitar controller. Additionally in order to keep him interested in the game, Tim would frequently create rules or goals for himself while he plays the game. For example, similar to Chelsea, Tim would play certain songs to achieve a higher score on a previously played song. Additionally, Tim described how he would often pretend that he was a rock performer when he played the game by himself. This could indicate that the context in which Tim played the game was his own personal social world where he was able to use his imagination. It was apparent in the interviews that Tim enjoyed playing *Guitar Hero*, however he had lost some interest in the game because his friends did not play it anymore.

The importance of developing interpersonal relationships in musical contexts is not a facet of musicianship. Rather, Elliott's theory of Praxial Music Education focuses on the single person, and the development of their musical skills within an educational context. However by creating and developing relationships with others in musical settings, one can learn through the sharing of ideas, skills or capital. This is an important facet of musical development that Praxial Music education does not address, hence why Bourdieu's theory of capital (1986) was used to address this.
4.4 Summary

The chapter presented key themes and subthemes identified from the participants' descriptions of their experiences with playing Guitar Hero and Rock Band. It started with introducing each of the participants, and presented themes that emerged from the participants' descriptions. This was followed by a brief discussion of the themes as to their importance to the study. The next chapter will answer each of the research questions, and discuss the implication of this study on future research.
Chapter 5: Conclusion

5.1 Introduction

This chapter will discuss the findings from this study and describe how these findings have answered 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 does engaging with these games provide?

Following a discussion of the findings, a short summary will tie the three research questions together. This is followed by a discussion of the implications for practice derived from these findings, the limitations of the study, potential directions for further research. The chapter closes with a summary of the conclusions drawn from the study.

5.2 Research Question 1

What do adolescents experience when playing music games?

One of the primary goals of this research project was to understand the experiences of the participants as they engage with games like Guitar Hero and Rock Band. From the descriptions given by the participants, their experiences have three main characteristics: social, informal music making, and role-playing.

5.2.1 Social

All participants highlight the social aspects of playing the games. Chris described how he would often play the game with his family. Eva and Terry both described playing the games together with their older brother. As they had only one guitar controller, they had a set of rules in place so that everyone would get a turn. Eva had also described playing Rock Band at her friend's house; interacting with each other through particular personas that they had created for themselves. Chelsea described playing the game with her younger brother during which each had specific songs that they
would play and they would work towards achieving the highest possible score in the
game.

This evidence suggests that even though the participants share a common experience
of playing the game with others, these experiences differ depending on who is playing
the game with them. Each person would bring to the game their own form of music
and/or gaming capital (prior experiences) which would impact how the game was
played. Success in the game was a culmination of the participants' developed music
and gaming capital. Capital was defined in this study as a type of social asset, which
is inherited and continually developed and exchanged over the lifetime of the
individual (Bourdieu 1986). The participants used their capital towards developing
social rules with the game, choosing specific instruments to play (due to their skill or
interest with the instrument), or working with others to achieve the best possible
score. Additionally, playing the game with others would also have developed their
music and gaming capital within the group through the sharing of ideas and
experiences. For example, Eva's experiences playing the game at home differed in
comparison to playing the game at her friend's house. At home she was limited to
sharing one guitar controller with her brothers and playing a song for enjoyment.
When she played the game at her friend's house, her friends shared a common interest
with taking on personas that they associated with each instrument controller. Each
person who played the game with Eva brought a different type of skills, knowledge
and interest to the game, which altered the experience. Specifically, her brothers
brought knowledge of video games, which they focused on completing songs on the
hardest possible level of difficulty, whereas Eva's friends were more interested in the
role-playing element of being a rock performer.

These results are consistent with a study that examined the use of music games by
adolescents (Missingham 2007). The study found that the ability to play the game
with others was one of the motivating factors for engaging with music games. The
literature along with the current study suggests that gaming socially is a common
experience among current video games. Additionally, the games Rock Band and
Guitar Hero allow for social interaction among the players and the creation of social
relationships.
5.2.2 Informal Music Making

Playing music games involved the participants in a form of informal music making. Each participant was able to use their music capital developed through their school music classes, their private instrumental lessons and/or other experiences with music and associate the manifestations of the musical concepts to the game. The participants were able to take formal concepts and apply them to an informal musical experience. For example, Chris was able to play fills on the drum controller that he had learned in his drum lessons. Tim was able to conceptualise the on-screen notation in terms of the concept of duration. Eva, Chelsea and Tim compared the coloured on-screen notation to high and low sounds (concept of pitch). All of the participants discussed their improvement in reading and playing the on-screen notation over time. The participants realised that they were not directly responsible for the sounds of the instruments, however there was a shared feeling that they were each playing or at least being involved in music making. This suggests that music game play encouraged music making and music listening.

The finding that music games can involve players in some of the formal concepts of music in an informal context is consistent with a number of studies that examined the use of music games and informal music learning (Gower & McDowall 2012; Green 2006). One study found that the nine students who played the games felt as if they were playing a type of music as they were able to associate formal concepts of music they had learned in the classroom to the game (Gower & McDowall 2012). Additionally, the study suggested that the instrument controllers associated with the game could be considered interactive, as controller reacts in real time to the player's actions, similar to real instruments. Therefore, players who engaged with the game could consider that they are in fact making music through responding to the on-screen notation and applying it to the instrument controller. Another study examining informal music making in the classroom found that students were more engaged in the learning outcomes through experimentation with instruments and composing (Green 2006). This research study defined informal learning as five distinct practices: (1) students choose music that is familiar, enjoy and strongly identify with; (2) students copy the recordings by ear in the form of notation or other written instructions; (3) students are self taught, normally in groups; (4) students assimilate knowledge and skills in personal ways; (5) through the informal learning process there is an
integration of listening, performing, improvising and composing with an emphasis on creativity (Green 2006). This differs from informal knowledge (according to Elliott's musicianship) in that it relates to the actions musicians make based on prior informal experiences. The participants in the study felt as if they were involved in the experience of making music as they were in control of their learning outcomes. Additionally, were unaware they were using prior formal knowledge to compose a piece of music within an informal learning environment. This suggests that the perception of making music is based on the interaction between the person and the music technology being used. Furthermore, it suggests that these games could be used to engage students to become more involved with music making by offering a different context for students to apply formal musical concepts.

5.2.3 Role-Playing

_Guitar Hero_ and _Rock Band_ engaged the participants in a form of role-playing. The participants discussed pretending to be a rock performer on a stage or that they imagined playing authentic instruments. For example, Eva explained how her friends would each take on a rock persona and pretend that they were in a band. Chris explained that in the past he felt as if he were performing on a stage. Chelsea explained how she would often sing while she played the game, making her feel as if she was a singer songwriter. Terry had played the game before starting guitar lessons. He explained that he wanted to move out of the fantasy of playing a guitar controller and move on to playing something that was real. This evidence suggests that the participants each shared a common lived experience of being actively involved in the game through their imagination and the creation of an alternate identity. Additionally, this suggests that the game is not just limited to being a type of instrument simulation, but rather it is able to expose players to the experience of performing.

The finding that the games can facilitate the creation of role-playing identities is consistent with research in the area of music games (Miller 2009) and video game role-playing (Martin 2012). The first study examined _YouTube_ videos of people playing _Guitar Hero_. The study found that players would often take on the persona of a rock star in order to engage their _YouTube_ audience. The researcher suggested that these players were focused on being creative through focusing on the authenticity of their _Guitar Hero_ performances (Miller 2009). Another study focused on young
peoples' use of MMO's (Massively Multiplayer Online) games like World of Warcraft. It examined eight youth male players, their identity, and how their identity is tied to their play style with World of Warcraft (Martin 2012). The study uncovered that the participants' own personal identities bridged the physical and virtual world wherein the actions, rules, tastes and desires were present in game and in the outside world (Martin 2012). This suggests that video games can help to shape the identity of the player. In the current study the participants had discussed that playing Guitar Hero and Rock Band made them feel like a rock star. The game provided the context for these participants to act out and shape their 'rock star' identity as well as feel creative.

5.2.4 Conclusions

The participants' experiences were characterised into three main ideas: social, informal music making, and role-playing. Each of these experiences were associated with who the participants played the game with, how they associated their prior musical knowledge and experiences (music capital) with the game, and the identities they created as a result of playing the game. The findings from this study combined with the research literature suggest that Guitar Hero and Rock Band provide players with a particular kind of social music gaming experience that allows players be involved in aspects of music and music role-playing.

5.3 Research Question 2

How does playing Guitar Hero and Rock Band impact an adolescent’s musicianship?

Guitar Hero and Rock Band are limited in the way they impact an adolescent's musicianship. However, the results suggest that the games provide a context for the participants to apply their prior musicianship developed through their private instrumental and/or music classes. Furthermore, due to the lack of longitudinal observations the answers to this research questionnaire limited to the two sessions with the participants and did not examine the ongoing development of gameplay on musicianship. This next section will focus on the five forms of musical knowledge as
part of musicianship (Elliott 1995). As musicianship is about how the four forms of knowledge are applied in action of playing an instrument, singing or composing, the first section begin answering the research question by discussing of how the game impacted the participants' formal, informal, impressionistic and supervisory knowledge. Following, the section will discuss how the game impacted their procedural knowledge through their application of the other forms of knowledge to the instrument controllers.

5.3.1 Formal Knowledge

The participants were able to demonstrate their prior formal knowledge of the concepts of music and instrumental techniques to playing the game. This study defined formal knowledge as the application of verbal and non-verbal facts, concepts and theories related to music (Elliott 1995). This can include the concepts of music through the NSW BOS Years 7-10 Music Syllabus (2003) as well as any elements that relate to these concepts that the participants would have learned in their school music classes. The concepts of pitch and duration were described by all of the participants. For example, the participants described the coloured on-screen guitar notation as representing high and low sounds (concept of pitch), and the participants discussed listening to the beat or rhythm of the songs (concept of duration). The participants were able to demonstrate their understanding of pitch and duration to the game. For example, Tim understood the lines that scroll down the screen as bars in music which kept him in time with the music and allowed him to read the on-screen notation. Chelsea conceptualised the distance between each of the notes in terms of rhythmic values, which helped her to read the on-screen notation. This suggests that players are able to. This suggests that the game does not teach players any formal concepts of music, however it provides an opportunity for players to recognise and demonstrate formal concepts and techniques while playing the game. This game could be used in an educational context for students to demonstrate their understanding of the concepts of duration and pitch, therefore giving students a different kind of learning experience through the use of technology.

Players were able to relate prior formal knowledge of the concepts of music to playing and understanding the game. This result is consistent with two recent studies that examined the experiences and musical development of students who play the
music games (Gower & McDowall 2012; Richardson & Kim 2011). A South Australian study examined the experiences of nine students aged 9 - 11 who played *Guitar Hero* and *Sing Star* (Gower & McDowall 2012). This study found that these games did not teach the participants formal knowledge; rather the students demonstrated their understanding of formal concepts of music like pitch, duration and structure by applying it to the game. The other study examined how *Guitar Hero* and *Rock Band* developed university students' musical skills (Richardson & Kim 2011). The researchers administered a series of aural and rhythmic tests before and after the 22-24 participants played *Guitar Hero* and *Rock Band* for a period of nine weeks. The study found that some of the participants were able to understand aspects of the games in terms of specific concepts of music. However the research was inconclusive whether the game developed the use of any formal knowledge (Richardson & Kim 2011). Additionally, the tests administered did not relate directly to the experiences from the game, did not determine whether participants with prior musical knowledge impacted the results, nor did it outline what instrument controllers the participants used. Formal knowledge is not only about understanding facts and concepts, but it is also the ability to apply these concepts in a musical context as knowing-in-action (Elliott 1995). Therefore, this suggests that although the game does not teach players formal knowledge, the game provides opportunities for players to apply their formal knowledge to a different musical context. Additionally, it suggests that further research needs to be conducted into whether these games develop formal concepts and skills.

### 5.3.2 Informal Knowledge

The game forces the players to develop their informal knowledge in order to progress through the game. This includes developing their knowledge of the rules of the game, playing techniques, reading the on-screen notation, and socialising with others. Informal knowledge is defined in this study as the application of musical common sense developed over time. It is based on reflecting critically and making musical judgements in action (Elliott 1995), which is developed through problem solving and developing strategies. The participants described that they became more comfortable with reading the on-screen notation while progressing through the levels of difficulty in the game. In time they were able to read more complex notation, and play more complex songs. Additionally, the participants described techniques that they
developed to play the game. For example, Chelsea described how she placed her hand in between the coloured buttons so she was able to reach the bottom and top-most buttons. Chelsea, Terry, and Chris discussed how they would use alternating strumming techniques to play fast repeated on-screen notation. The ability to draw on the previous experiences apply it to the instrument controller is part of procedural knowledge.

The participants' ability to play an unfamiliar song demonstrated their level of informal knowledge with the game. The researcher observed the participants using their prior knowledge and experiences with the game to reflect critically and make musical judgements while playing an unknown song. For example, Chris chose a song on the guitar controller on a medium level of difficulty. On the first attempt, Chris was unable to play the on-screen notation of the chorus section and failed the song. After the second attempt, Chris was able to read and follow the on-screen notation of the chorus section. This demonstrated that Chris was able to reflect critically in action by learning from his mistakes and refining his playing techniques for the specific song. The evidence suggests players can develop their informal knowledge by reflecting on their prior experiences and applying them to an appropriate context of the game. Additionally, it suggests that players could learn over time to think critically in action, to make technical or musical judgements while engaged in playing the game. Although applying informal knowledge plays the largest role with playing the game, a player's rate of development is dependent on their choice and ability to critically analyse the experiences.

The results of this study did not determine whether the informal knowledge developed and applied to these games could be used in other musical settings/environments, however current research suggests that it is possible (Gower & McDowall 2012; Richardson & Kim 2011). One study found that that Guitar Hero and Rock Band gave the nine participants a better understanding of melody, tempo and metre matching through their informal experiences with the games (Gower & McDowall 2012). Another study found that the research participants became more fluent with sight-reading the games' on-screen notation (Richardson & Kim 2011). However there is still not enough evidence to suggest that gaining and developing informal knowledge through playing the games can result in a deeper understanding of music. Further
research needs to be conducted on whether the informal knowledge developed from the game could be applied to other educational contexts.

5.3.3 Impressionistic Knowledge

The ability to make emotional choices while playing the game is very limited. Impressionistic knowledge is defined in this study as the ability to intuit musical choices while playing, singing, and composing (Elliott 1995), for example, sensing how to dynamically phrase a section of music. The participants were able to make some emotional choices while playing the game. For example, some of the participants described sensing when to use the Star Power/Overdrive feature, or using the whammy bar in specific sections of the music where appropriate. Chris described sensing where he could play fills on the drum controller in between sections of the song. However, this was learned through his private drum lessons, and not learned through the game. This evidence suggests that the emotional choices players can make while playing the game is extremely limited. They are able to choose songs and instruments, but they are unable to interact with any musical elements of the songs. As the game penalises players for going outside the rules and structure of the game, it can hinder a player's ability to develop their senses with playing music, such as learning how to phrase a musical line.

Music games do not provide a context for players to develop or demonstrate intuition with playing music. This contrasts with a previous study on the use of video games by adolescents (Missingham 2007). The study found that the game impacted a number of emotional musical choices. First, the study found that not only did the participants have a positive emotional experiences with the game, but also that these experiences helped to influence young people to play real instruments. Second, the study reported that the game inspired adolescents to be more involved with music. Finally, the study found that the controllers and songs in the game provided an entry point for young people into music education (Missingham 2007). The evidence from this study suggests that the limited number of choices in the game can develop emotional choices towards the styles/genres of the game, and develop positive feelings towards music. Furthermore, it suggests that these games could be used to engage students in music as players find these games exciting and meaningful (Gower & McDowall
However, further researcher needs to be conducted on how players can develop and/or demonstrate their musical intuition through playing music games.

5.3.4 Supervisory Knowledge

The use of supervisory knowledge plays a significant role in the long-term development with playing the game. This study defined supervisory knowledge as the ability to self regulate, manage and think while playing an instrument/singing (Elliott 1995). The participants described different ways that they would self regulate and monitor themselves when playing the game. For example, Eva and Tim discussed how they would make sure that their fingers would not move off of the coloured buttons. Chelsea described how she attempted to get the highest possible score on each of the songs. In order to do that, she described using the practice feature and discussing playing techniques with her brothers. All of the participants discussed listening to the music (rhythm) while playing the game. This enabled them to keep in time and to properly read the on-screen notation. This evidence suggests that the game pushes players to develop their supervisory knowledge while playing the game. There is the necessity to monitor what is happening on the screen, and then be able to apply it successfully on the instrument controller. The game also allows for long-term development through the use of the practice feature, and the steady progression of easy to difficult songs.

These games help to develop a player's ability for self-regulation. This is consistent with two studies that examined students, adolescents and professional musicians use of the game (Gower & McDowall 2012; Missingham 2007). One study found that students were able to self-regulate through memorising sections of the songs and/or continually managing the position of their left hand on the neck of the guitar controller (Gower & McDowall 2012). The other study discussed the games with five professional musicians who suggested that Guitar Hero and Rock Band could be used as a practice aid for playing real instruments through monitoring and developing skills that could be transferred to real instruments (Missingham 2007). However three of the professional musicians in this study stated that these games could also have a negative impact on practice and playing techniques. This suggests that these games can help to develop problem solving strategies, however there is still not enough evidence to suggest that the game can help with playing and practicing techniques. Further
research needs to be conducted to determine whether the practice feature of the game could develop practicing techniques in players, or whether the skills gained from the game could be applied to authentic instruments.

### 5.3.5 Procedural Knowledge

The game is limited in how it impacted the participants' procedural knowledge. In this study procedural knowledge is defined as the ability to apply the four other types of knowledge in a manner which demonstrates the quality of the person's actions with performing or composing (Elliott 1995). For example, this can include the ability to create quality sounds, the ability to play with appropriate dynamics, or the ability to play complex rhythms. The participants were not creating quality sounds through the use of the instrument controllers, however, the evidence suggests that the participants were able apply some of the forms of knowledge to playing the game. Therefore this last section will address how the game impacts a player's procedural knowledge by briefly discussing the main points from the other four forms of knowledge and how they relate to procedural knowledge.

All of this evidence suggests that the game is limited in the manner it impacts procedural knowledge. In order to significantly impact procedural knowledge, the other four knowledge types must also be impacted and applied while playing the game. Formal knowledge is not learned through the game, but the game can be conceptualised through different theories, concepts (like rhythm and pitch) and playing techniques. Informal knowledge is impacted through the various experiences of the player, but it is the player's ability to critically analyse these experiences, which is important. The evidence would suggest that not all people would tend to critically analyse their actions/experiences, as this is a game and it is for recreation. The game does not impact a player's impressionistic knowledge while playing the game on the guitar controller as the player cannot interact with the notes, duration, phrasing, etc. Therefore developing a sense while playing the game is limited. Supervisory knowledge like informal knowledge is dependent on whether the player wishes to improve at playing the game. The evidence suggests that self-regulating, problem solving, etc. is necessary to play the game. Players need to be aware what their hands/fingers/feet are doing while they are playing the game. They need to be able to recognise a mistake and learn from it. If procedural knowledge is about the ability to
apply the four forms of knowledge to playing music, it is evident that this game does not adequately impact a player's procedural knowledge, and therefore is limited in impacting musicianship.

Music games are very limited in impacting a player's procedural knowledge. This claim contrasts with two studies that examined the use of *Guitar Hero* by students and regular players of the game (Gower & McDowall 2012; Miller 2009). Both studies suggested that music games could develop the areas of coordination, music literacy and the application of these concepts to an instrument (Gower & McDowall 2012; Miller 2009). Additionally, one study suggested that music games help to develop the ability to scan music (Miller 2009). Players of *Guitar Hero* need to learn how to not only read the music scrolling down the screen, but to also look ahead in the music to see what is coming next. Reading music in this way is developed over time, through exposure to musical experiences (Elliott 1995). These two studies only offered suggestions, which were only supported by the researchers' conclusions. Additional research needs to be conducted into whether the skills learned from playing music games could be applied to other authentic musical instruments or musical experiences.

### 5.3.6 Conclusions

Empirical research confirms that music games can impact some areas of musicianship, however it is limited (Gower & McDowall 2012; Richardson & Kim 2011; Miller 2009; Missingham 2007). Evidence from this project suggests the same. The participants demonstrated some forms of musical knowledge through playing the game, but much of the knowledge that was demonstrated was either previously developed in their private instrumental lessons or music classes. These games do not develop musicianship, but they provide an opportunity to apply facets of previously developed musicianship.

### 5.4 Research Question 3

*What educational opportunities does engaging with these games provide?*
The results of this study indicate that music games can provide some educational opportunities. This study examined what the participants were experiencing through playing *Guitar Hero* and *Rock Band*. In order to answer this research question, the researcher used the BOS NSW Years 7-10 Music Syllabus (2003) as a framework. Therefore the researcher will answer this research question by focusing on the descriptions given by the participants and how they related to three areas of the syllabus: concepts of music, learning experiences, and context.

### 5.4.1 Concepts of Music

The games allowed the participants to demonstrate their knowledge and skills with some of the concepts of music. The NSW BOS Years 7-10 Music Syllabus (2003) divides music into six main concepts: duration, pitch, dynamics & expressive techniques, structure, tone colour and texture. The evidence showed that the games allowed the participants to demonstrate their knowledge and skills with duration, pitch and structure, as they were the only concepts described by the participants in relation to their experiences. The other three concepts of music were examined in the discussion section of the results.

#### Duration

Participants were able to demonstrate their understanding and skill with the concept of duration through playing *Guitar Hero* and *Rock Band*. This study understood duration as the length of sounds and silences in music and includes aspect of beat, rhythm, metre, tempo, pulse rates and absence of pulse (Board of Studies NSW 2003). All the participants described either listening to the beat, rhythm, and/or tempo; or conceptualising the on-screen notation in terms of Western rhythmic notation. For example, Chelsea and Tim were able to make comparisons between the on-screen notation and Western notation that they had learned in school and/or their private instrumental lessons. Chelsea compared the on-screen notation to crotchets and semi-quavers, in that the distance between each of the notes would indicate a specific rhythmic value. Tim was able to associate the bars that scroll down the screen to bars in music which group the number of beats. Alternatively, Eva and Chelsea indicated that the speed in which bars that scrolled down the screen indicated the tempo of the song. This evidence suggests that the game does not teach players how to
conceptualise duration. However it suggests that the game allows players to show their understanding of duration through specific aspects of the concept. For example, players could show that they understand beat, rhythm and metre through listening to the music and applying those aspects to playing the game.

Music games can provide the opportunity for students to apply their understanding and skill in duration through different learning experiences. This is consistent with one study that examined the use of Guitar Hero and SingStar in a music classroom (Gower & McDowall 2012). The nine students who participated in the study (aged 9 - 11) reported that they had developed their rhythmic skills through playing the game. This contrasts with another study that found that there was no correlation between playing the games and applying the rhythmic skills learned from these games to other musical experiences (Richardson & Kim 2011). This suggests that the games do not teach players about duration; however these games could be used to reinforce and demonstrate the concept of duration. Further research needs to be conducted to examine how students can relate the concept of duration taught in class to playing the games.

**Pitch**

The games Guitar Hero and Rock Band are limited in the way it can teach and reinforce the concept of pitch using the guitar controller. This study understood pitch as the relative highness and lowness of sounds, which includes higher and lower pitches, direction of pitch movement and indefinite and definite pitch (Board of Studies NSW 2003). The participant's had varied descriptions of the guitar controller's on-screen notation in terms of pitch. For example, Tim and Terry related the coloured notation (which represented different pitches) directly to the buttons on the guitar controller. Chris and Chelsea related the coloured buttons to low and high sounds, signifying that the green button was the lowest sound and the orange button was the highest sound. Eva was the only participant who described the coloured buttons in terms of actual pitch values (e.g. A, B, C, D, etc.). This variation suggests that the guitar on-screen notation can be conceptualised in terms of pitch, however this is restrictive due to the limited number of buttons on the guitar controller. Rather, the use of the microphone controller either in Guitar Hero and Rock Band or SingStar may be a better method to teach the concept of pitch. The microphone on-screen
notation is not limited to specific buttons and is not melodically fixed which would allow students to explore the concept in greater detail in comparison to the guitar controller. Further research into the use of the microphone controller could determine other educational opportunities that these games could provide.

The guitar controller is limited in the way it can allow players to explore the concept of pitch. This result is consistent with a quantitative study that examined how playing *Rock Band* impacts university students' musical skills (Richardson & Kim 2011). The results of the study found that there were limited improvements in the participants' ability to sing, hear or respond to concepts of pitch. Another study that examined students who played *SingStar* (a game which requires the player to sing into a microphone) suggested that the microphone controller would be better suited to explore the concept of pitch (Gower & McDowall 2012). The study found that the students described a marked improvement in recognising and singing the distance between pitches. However, there was no evidence to suggest that the student's who used *SingStar* actually developed their ability to read and understand pitch. Rather they were able to describe their experiences with the game using formal music vocabulary. This suggests that music games could be a way to involve students with the concept of pitch through relating their formal experiences to the game. Additionally, the evidence suggests that more research needs to be conducted on the use of the microphone controller in the game to determine how or if it could be used effectively in a music classroom to allow students to explore the concept of pitch.

**Structure**

The game could be used to teach the concept of structure. However, a music teacher would need to provide guidance to those students who do not have prior knowledge or an understanding of structure. Structure is defined as the design or form in music. It relates to the ways in which music sounds similar and/or different (Board of Studies NSW 2003). The participants were able to recognise and describe repeated sections in the songs that they played, which indicated that they could demonstrate their understanding of structure through playing the game. For example, Eva used words like "chorus" and "verse" to describe similar sections of the songs she played. However, not all of the participants described the songs in terms of specific structural
elements. This suggests that a music teacher could use the game as a context to discuss the concept of structure, by focusing on the repeated sections of a song.

The practice feature in the game is the only place where structural terms are used within the songs. The practice feature allows the player to pick specific sections in a given song, and practice the on-screen notation at different speeds. Chelsea was the only participant who had used the practice feature in the game and had made reference to how she was able to break the songs down into sections. The other participants were aware of the practice feature but were not interested in using it. This suggests that the practice feature may not be as engaging as the other features of the game, but could be used in the classroom to explore and demonstrate concrete examples of structure.

The practice feature is limited in how it can engage students with the concept of structure. This is consistent with one study that examined music teacher's perceptions and students' use of Guitar Hero (Gower & McDowall 2012). One of the teachers suggested that the practice feature was the only feature of Guitar Hero that incorporated specific elements of structure within the game. However it was not reported that any of the nine students participating in the study had used this feature. This evidence supports the claim that although the practice feature does incorporate elements of structure, it may not be engaging enough for people to use. Further researcher needs to be conducted to determine why the practice feature does not engage students.

5.4.2 Learning Experiences

There are a limited number of learning experiences that engaging with these games can provide. The BOS NSW Years 7-10 Music Syllabus (2003) states that students should learn about the concepts of music through three main learning experiences: Listening, Composing, and Performing. The third research question focuses on the educational opportunities provided by playing these games. It will be answered in part by discussing how the learning experiences related to the descriptions given by the participants.
Listening

_Guitar Hero_ and _Rock Band_ provide a limited number of listening experiences. This study defined listening as the ability to hear, understand and respond to a wide range of musical styles, periods and genres (Board of Studies NSW 2003). The participants discussed that they were always listening when playing the game. This allowed them to know how to play the on-screen notation at the correct time (duration), understand differences in pitch levels in relation to the coloured buttons on the guitar controller (pitch), as well as responding to structural changes in a song (structure). For example, Terry had discussed that when he played familiar songs he could focus more on listening to the song and using the guitar controller, rather than the on-screen notation. This evidence suggests that the game could be used to teach students how to listen-in-action through the genre of Rock music. Listening-in-action is an important facet to playing a musical instrument, as it allows the player to aurally monitor their actions and the environment in which they are playing (Elliott 1995). Additionally, using the game could teach students how to discriminate between the sounds heard in the song, recognise which instrument they are playing and broaden their knowledge of repertoire.

The games play an important role in developing listening skills in players. This contrasts with a research study that examined the impact of _Guitar Hero_ and _Rock Band_ on musical skills. This study found that the games had no positive impact on the participants' listening skills (Richardson & Kim 2011). However, this study examined whether the participants' listening skills gained from playing the games could be used to take a series of aural music tests. Additionally, the researchers stated that the results from the study were inconclusive given the limited number of participants. This suggests that further research needs to be conducted on how players develop listening skills while playing these games. However, these games could be used in conjunction with an appropriate pedagogical approach to teach students about listening by giving students a different learning experience within the context of the classroom to practice and apply their listening skills to playing the game.
Composing

The composing program of Guitar Hero (GH Mix) can provide a unique opportunity for students to compose. This study defined composing as the ability to organise sound (Board of Studies NSW 2003). Tim was the only participant who used this program for the interviews. He described a number of features of the program that focused on the concepts of pitch, duration and tone colour. For example, Tim described that he was able to choose a number of different sound sources for the various instruments in his composition. Additionally, Tim described features of the program that allowed him to input and manipulate elements of duration and pitch. Such as the ability to change the length of the coloured notes to specific rhythmic values and the ability to choose what pitches each of the coloured notes represented within a scale. This suggests that GH Mix provides a unique learning experience that could allow students to demonstrate their knowledge and understandings in some of the concepts of music. Additionally, this could be a way for students to move away from using computers and use a more interactive composition software.

The composition feature of Guitar Hero can improve engagement with composition activities. This is consistent with one study that focused on using graphic notation software (Pitts & Kwami 2002). The study found that students were more effective and engaged in the act of composing using the technology in comparison to composing using traditional hand written compositions. A South Australian study found that music teachers would consider using the games more in their classroom if a composition feature was included (Gower & McDowall 2012). However, the two teachers in this study as well as the two researchers were not aware of the GH Mix feature that was included with the version of Guitar Hero that they examined. This suggests that the composition feature of Guitar Hero deserves further study into how it enables students to compose. As this composition software allows players to interact with and manipulate some of the concepts of music, teachers could use this as a way to engage students in a form of interactive composition through the use of the instrument controllers.
**Performance**

The games would provide students with a very limited experience with performing using the guitar controller, as it does not meet the practical definition of performance. This study defines performance as participating in any form of practical music making in solo and/or ensemble situations (Board of Studies NSW 2003). All of the participants in the study felt that they were not performing when playing the game due to the fact that they were not responsible for the sounds of the instruments heard through the speakers. However, three of the participants (Chelsea, Eva and Tim) described that the game allowed them to pretend to perform. The drum and microphone controllers may be more suited for players to perform, as the actions of the player on the two instrument controllers are heard directly through the speakers. For example, Chris was observed adding fills in between the on-screen notation of the drum controller. All of his actions were heard directly through the television speakers. This could suggest that the drum and microphone controllers may be better suited in the classroom as a stronger performance experience, allowing students to demonstrate their abilities to read a form of graphic notation.

These games are very limited in how they engage players in the experience of performing. This contrasts with a previous study examining young peoples' and professional musicians' attitudes towards playing music games (Missingham 2007). This study suggested that these games can help develop confidence in young people towards engaging in performance activities. Additionally, the study suggested that music games are centred on performance, which they support by referencing *Guitar Hero* competitions and at least three YouTube videos that show young players demonstrating their skills with the game. This suggests that there is contention over what is considered to be music performance. The developers of *Guitar Hero* created the game as a performance simulator (Miller 2009). However a person playing the game on the guitar controller is not directly responsible for the professional sounds heard through the television speakers. Therefore since performance is about making music, this game is generally aimed towards demonstrating abilities rather than performing and creating sounds through instrument controllers.
5.4.3 Context

The games *Guitar Hero* and *Rock Band* provide players with a context to engage with the style of Rock music. This study defines the term context as the teaching music of different styles, genres and periods (Board of Studies NSW 2003). The participants in the study described how the game introduced them to different types of music within the 20th and 21st century. Additionally, the participants described how they would actively download the songs they enjoyed to listen to them in their free time. This suggests that this game could be used in the music classroom to further introduce students to new styles and genres of music.

These games can introduce players to new styles and genres of music. This is consistent with one study that examined the use of music games by players (Miller 2009) and another study that examined the use of music games in an education context (Gower & McDowall 2012). One study conducted an online web survey that asked the 509 respondents who played the game whether they had heard any of the songs prior to playing *Guitar Hero* and *Rock Band*. 59% of the respondents knew less than half of the songs in the game, 79% indicated that the games increased their appreciation for new songs/genres, and 75% had added new music to their listening collection as a result of the game (Miller 2009). A music teacher in another study reported that *Guitar Hero* had the ability to introduce students to old rock classics and can encourage students to appreciate them (Gower & McDowall 2012). This suggests that games like *Guitar Hero* and *Rock Band* could be used in the music classroom to expose and engage students with different genres and styles of music.

5.4.4 Conclusions

Music games can provide some educational opportunities. The evidence suggests that students can demonstrate their knowledge and skills with the concepts of duration, pitch and structure. While the participants in the study were able to relate and demonstrate the concepts of duration, pitch and structure on the guitar controller, current research would suggest that the microphone and drum controller would be more effective in demonstrating, and reinforcing these concepts (Gower & McDowall
2012; Richardson & Kim 2011). Additionally, it suggests that the level in which the participants related their prior musical knowledge and experiences to the game was a direct result of their current developed music capital. However there are a limited number of learning experiences that these games can provide. Further research needs to be conducted on how these games could be used effectively within a music classroom.

5.5 Summary of Findings

Evidence from this study suggests that Guitar Hero and Rock Band involved the participants in social, musical role-playing experiences. The participant’s experiences were shaped by how they perceived playing the game, and the prior music and gaming experiences they brought to playing the games.

Music games are limited in the way that they impact a player's musicianship. The limited procedural knowledge was associated with the other four forms of musical knowledge demonstrated and described by the participants. The games were limited in impacting the participants formal and impressionistic knowledge as the game did not teach any formal concepts, or allow the participants make emotional/intuitive choices while playing the games. However, the game developed the participants' informal knowledge through the development of playing techniques and supervisory knowledge through demonstrating and describing problem solving techniques. The games were able to impact some areas of musicianship, however the evidence suggests that these games could not be used as a comprehensive tool to develop all areas of musicianship.

The games provided some educational opportunities. The participants were able to associate the concepts of pitch, duration and structure to playing the game. This suggests that these games could provide students with the opportunity to demonstrate their understanding and skills with these concepts. The games provide a limited number of learning experiences. The participants discussed a number of ways they listened while playing the games, which suggests that the games could be used in a number of listening activities. Through the descriptions provided by Tim, the evidence suggests that the composing program GH Mix could be used to engage
students in the act of composing. Performing is the most limiting learning experience while using the guitar controller. This study suggests that the microphone and/or drum controller would be better suited to use in performance activities as the actions of the player are directly hear through the speakers of the television.

5.6 Implications for Practice

The aim of this study was to understand the experiences adolescents had when playing music games. Additionally, the aim of the study was to consider whether these games could be used in the context of a music classroom. This draws upon the findings in the previous sections to discuss how these games could be used in the context of a music classroom.

_Guitar Hero_ and _Rock Band_ have limited potential for application in the classroom. This is due to the fact that teachers would be restricted in the extent to which they could use the technology to teach the concepts of music. As the guitar controller's on-screen notation has only five notes, teaching pitch direction or even the highness and lowness of sound would be extremely limiting. The microphone controller notation would be more useful in the context of the classroom. Being very similar to graphic notation, it is able to demonstrate the highness and lowness of sound, the direction of pitch and melody. Additionally, students would need strict guidance by teachers to connect the formal concepts of music to the game. By reducing the game elements to specific concepts of music could make the game less interesting for the students and possibly resulting in the students resenting the teacher for turning an enjoyable game into a complex learning experience. As the games _Rock Band_ and _Guitar Hero_ have ceased production as of 2013, including these games within a school curriculum may be difficult. However, new games are currently being developed which incorporate authentic instruments (see 5.8 Suggestions for Future Research). Duration (rhythm, beat, pulse metre) as defined by the NSW BOS: Music Syllabus (2003) is the most accurately displayed concept of music in the games. The notation for all three instrument controllers displays forms of metre through the use of bar lines and a rudimentary form of beat grouping. Tempo is also represented through the speed of the music with the on-screen notation scrolling either down or across the screen.
Rhythm in the game is rather inaccurate when comparing it to Western notation. Players are required to see the distance between each of the coloured dots for the drum and guitar controller, notice the length of notes with the trailing line behind the note, or the length of a given line for the microphone controller. This could suggest that the game is better suited to reinforce the concept of duration rather than teach it.

Teachers could use the technology to help reinforce music concepts learned in the classroom. A discussion of the on-screen notation and the structural elements to each of the songs could help the students understand these concepts within the context of the game. Additionally, since the participants were able to explain the game through the concept of duration, it could be a way for students to apply their understanding of duration to the game.

There is an important pedagogical issue with the way the drum and guitar notation is presented and read. In Western countries, it is part of curriculum for students from a young age to read text from left to right. Instead of the entire notation being read from left to right, the game presents the drum and guitar notation scrolling from top to bottom. It would be confusing for students to suddenly learn how to read a new type of notation in a different direction than they are used to. Research studying the effect of teaching different forms of graphic notation in the classroom to improve students' understanding of the concepts of music have all included forms of music notation that is read from left to right (Barrett 2001; Reybrouck, Verschaffel & Lauwerier 2009; Walker 1981). Additionally, these forms of graphic notations worked in conjunction with students' literacy skills. If the game were to be used in the classroom, the microphone controller notation would be the most effective as it is read in the same direction as reading text.

The learning experiences associated with these games are limited. Students are required to learn about music through opportunities in listening, composing and performing (Board of Studies NSW 2003). Using the game to introduce students to performance activities could be problematic if only the guitar controller were used. Alternatively, the drum and microphone controller could be used as a performance opportunity. The drum controller is similar in nature to an electronic drum pad as the action of the player on the drum pad can be instantly heard through the speakers. Chris provided an example of this when he added fills to the song he played. The
microphone controller is an excellent way for students to sing in class with the sound of a professional backing band.

The use of GH Mix as an alternative to other composition programs being used in classrooms may be ineffective. The composing program GH Mix give the player the opportunity to demonstrate their understanding and skills with of the concepts of music such as pitch (chord structure, chord harmony, scale structure, etc.) and duration. However, many of these concepts are presented in the form of Western notation. For example, with scale structure players are able to see a picture of the notes within a given scale on a treble clef staff with sharp and flats next to the appropriate note. Teachers could use the composition program just as a way to demonstrate how some of the concepts of music relate to playing the game.

The songs within Guitar Hero and Rock Band could be used as a listening exercise within a unit of study. Teachers could use the game to teach students about listening-in-action, meaning teaching listening while they are playing the game. According to the NSW BOS Year 7-10 Music Syllabus (2003), students are required to study music through a broad range of contexts. This could include studying the styles of rock music heard within the game. Teachers could get students to play and listen to specific songs in the game. During this activity they could ask several questions regarding the instrumentation being played in the song (tone colour), structural elements of the song (structure), whether the song was in a major or minor tonality (pitch), or whether the song was in a duple or triple metre (duration).

These games would be largely ineffective for developing musicianship in students. According to the theory of musicianship, players need to use all the forms of knowledge in action in order to develop musicianship (Elliott 1995). As the evidence suggests from this study that not all forms of knowledge are being used effectively while playing the game, developing musicianship through using the games is limited. The microphone controller could be a more effective way of developing musicianship as the player is able to hear his/her own voice through the speakers and is required to read and respond to a form of graphic notation. However, further research needs to be conducted into whether the microphone controller be used in the classroom to develop musicianship.
There would be significant challenges in using music games into schools. Schools would have to purchase televisions, gaming consoles, and the Guitar Hero and Rock Band games for students to use and/or share in a classroom. Additionally, the school would require a space large enough to store this technology. Teachers would have to learn how to use the technology and learn how to teach music with it. Already, teachers are required to teach students how to use a composing program like Garage Band or Noteflight (Pitts & Kwami 2002).

5.7 Limitations of the Study

The results of this study should be viewed in light of the following limitations. The study only investigated the experiences of five Year 7 and 8 participants. Therefore, the results are limited and not generalisable to other situations. This project also recruited four participants with private instrumental training and one without these formal experiences. It would not be possible to accurately examine the effect of prior musical training on experiencing the game without comparing the results to an equal number of participants who did not have prior instrumental training.

This study investigated the participants' experiences with music games in the context of their home and not in the context of a school. Having the participants describe their experiences outside of where they play the game could have affected how they viewed their experiences. Therefore it is unknown how the descriptions of the experiences would differ in the context of a school.

The method of data collection was a limitation in this study. The lack of longitudinal observations did not allow for the researcher to examine the ongoing development of the participants musicianship through playing the games. Additionally, the lack of video recording did not allow for later analysis of the participants playing techniques but rather relied on the observational notes. Some of the parents involved with supervising the interview process often expressed their own opinions to some of the interview questions, or even answered some of the interview questions for the participants. This took away from the descriptions by some of the participants by not allowing their voices to be heard.
5.8 Suggestions for Future Research

The findings suggest that additional research needs to be conducted in the areas of music games. As many adolescents own and use these games in their home, the wider implications of this technology on their musical understanding, skills and knowledge still needs to be understood. The participants were able to describe their experiences with the game using knowledge and skills they had learned in their music classrooms and private instrumental lessons. Therefore it is possible that these games could beneficial towards reinforcing and developing the concepts of music and musical skills in the classroom. A study involving a larger number of participants could determine whether these games could be implemented effectively in the classroom.

There is evidence to suggest that the drum and microphone controller would be more effective with engaging players in elements of music. This study primarily focused on the use of the guitar controller by participants playing Rock Band/Guitar Hero, as these were the controllers owned by all of the participants. A more in-depth study examining how players engage with the drum and microphone controllers should be undertaken to understand what they are experiencing and learning. A similar phenomenological study focusing mainly on the drum and microphone controller could determine whether these instrument controllers would be more effective for use in the classroom.

The composition program GH Mix deserves further investigation. The limited evidence from this study suggests that the GH Mix composition software is able to engage players in a more interactive style of composition. A preliminary analysis of GH Mix found that players could interact with and demonstrate their understanding and skills with some of the concepts of music. Rather than the normal point and click method of composing using traditional forms of composition software like Garage Band and Sibelius, players are able to compose and record using the drum and guitar controller. A more in-depth analysis of this program needs to be conducted to determine how this game could be used to teach composition. Additionally, future research needs to be conducted on how this composition program compares educationally to other common school composition programs used to teach composition.
The design of the games and the description of the participants suggest that these games involved the participants in some of the concepts of music. However the level to which the participants could demonstrate their understanding and skills with these concepts was very limited. For example, the game did not allow the participants to manipulate any aspects of dynamics or demonstrate their understanding of structure. As technology is becoming more important in music classrooms (Pascoe et al. 2005), future research should examine developing a new technology that incorporates the engaging features of Guitar Hero and Rock Band, while allowing the students to interact and demonstrate their skills with all the concepts of music.

A new music game, Rocksmith was released in 2012 within Australia that incorporates the use of an authentic electric guitar. The player connects their guitar to their computer or game console with a USB adapter. The objectives of the game are very similar to those of Rock Band and Guitar Hero. The player follows the on-screen notation in the form of coloured dots that scroll down the screen and play the notes on their authentic guitar. A new version of Rocksmith set to be released in 2014, incorporates these same elements, but also attempts to teach players how to perform various chord progressions through the use of a guitar TAB feature. Not much is yet known about the game Rocksmith 2014 edition, but the implications of a game that incorporates an authentic instrument deserves further research into whether these games can teach players to play a guitar or even develop their musicianship. Additionally, further research may answer some of the unanswered questions within this current study, or further develop the current body of knowledge in the area of music gaming.

5.9 Conclusions

This study was conducted to investigate and understand the experiences of adolescents who engage with music games like Guitar Hero and Rock Band. After interviewing the five participants associated with the study, there were several key findings. They are summarised as follows:

- The games provided the participants with an opportunity to interact socially with others while playing the game.
• The games engaged the participants in aspects of role-playing, through the creation of rock star identities, or through pretending to perform.
• The games were limited in the way they impacted the participant's musicianship through their procedural knowledge. The games were only able to impact the participants informal and supervisory knowledge through the development of playing techniques, and their ability to problem solve difficult portions of the game.
• The games do not teach players formal concepts of music, rather provide the opportunity for players to demonstrate their understanding and skills with the concepts.
• The participants able to associate their knowledge of the concepts of duration, pitch and structure to playing the game. This was as a result of the participant's prior knowledge and skill developed in the private instrumental lessons and/or school music classes.
• The composition program GH Mix can engage players in a unique opportunity to compose music through the use of instrument controllers.

These findings are a significant addition to the limited research literature about music games. These findings carry implications for the use of music games in schools and the development of additional music gaming. The lack of research in this area and the growing popularity of music games should promote further research in music gaming.
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## Appendix A

**Musicianship, Music Gaming & Education Comparative Table**

<table>
<thead>
<tr>
<th>Learning Experiences</th>
<th>Concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>P = Performance</td>
<td>D = Duration</td>
</tr>
<tr>
<td>L = Listening</td>
<td>Pi = Pitch</td>
</tr>
<tr>
<td>C = Composing</td>
<td>ET = Expressive Techniques</td>
</tr>
<tr>
<td></td>
<td>T = Texture</td>
</tr>
<tr>
<td></td>
<td>S = Structure</td>
</tr>
</tbody>
</table>

### Type of Knowledge

<table>
<thead>
<tr>
<th>Examples of Knowledge</th>
<th>Links to Music Gaming</th>
<th>Links to NSW 7-10 Music Syllabus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Learning Experiences</td>
<td>Concepts</td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Procedural</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procedural</td>
<td>• Producing Quality Sound</td>
<td>• P &amp; L</td>
</tr>
<tr>
<td></td>
<td>• Reading Notation</td>
<td>• D &amp; Pi</td>
</tr>
<tr>
<td></td>
<td>• Active Listening</td>
<td>• D, Pi, ET</td>
</tr>
<tr>
<td></td>
<td>• Composing Music</td>
<td>• D, Pi, ET, TC</td>
</tr>
<tr>
<td></td>
<td><strong>Links to Music Gaming</strong></td>
<td>• L</td>
</tr>
<tr>
<td></td>
<td><strong>Links to NSW 7-10 Music Syllabus</strong></td>
<td>• P, C &amp; L</td>
</tr>
<tr>
<td></td>
<td><strong>Concepts</strong></td>
<td>• D, Pi, ET, TC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• D, Pi, TC, T, S</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• D, Pi, TC, S</td>
</tr>
<tr>
<td><strong>Formal</strong></td>
<td>• Read and write notation</td>
<td>• C &amp; L</td>
</tr>
<tr>
<td></td>
<td>• Understand symbols</td>
<td>• C &amp; L</td>
</tr>
<tr>
<td></td>
<td>• Understand structure</td>
<td>• C &amp; L</td>
</tr>
<tr>
<td></td>
<td><strong>Links to Music Gaming</strong></td>
<td>• P, L &amp; C</td>
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<tr>
<td></td>
<td><strong>Links to NSW 7-10 Music Syllabus</strong></td>
<td>• P, L &amp; C</td>
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<td><strong>Concepts</strong></td>
<td>• D, Pi, ET</td>
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<td>• D, Pi, ET, TC, T, S</td>
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<tr>
<td></td>
<td></td>
<td>• D, Pi, TC, T, S</td>
</tr>
<tr>
<td><strong>Informal</strong></td>
<td>• Sight reading music</td>
<td>• P &amp; L</td>
</tr>
<tr>
<td></td>
<td>• Understanding the style of music</td>
<td>• P, L</td>
</tr>
<tr>
<td></td>
<td>• Playing in a group</td>
<td>• P, L &amp; C</td>
</tr>
<tr>
<td></td>
<td><strong>Links to Music Gaming</strong></td>
<td>• P, L &amp; C</td>
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<td></td>
<td><strong>Links to NSW 7-10 Music Syllabus</strong></td>
<td>• P, L &amp; C</td>
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<td><strong>Concepts</strong></td>
<td>• D, Pi, ET</td>
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<td>• D, ET</td>
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<td>• D, Pi, ET, TC, T, S</td>
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<td></td>
<td></td>
<td>• D, Pi, TC, T, S</td>
</tr>
<tr>
<td><strong>Impressionistic</strong></td>
<td>• Emotion towards styles, genres of music.</td>
<td>• L</td>
</tr>
<tr>
<td></td>
<td>• Choice of instruments</td>
<td>• L</td>
</tr>
<tr>
<td></td>
<td>• Choice of difficulty of music.</td>
<td>• L</td>
</tr>
<tr>
<td></td>
<td><strong>Links to Music Gaming</strong></td>
<td>• L</td>
</tr>
<tr>
<td></td>
<td><strong>Links to NSW 7-10 Music Syllabus</strong></td>
<td>• L</td>
</tr>
<tr>
<td></td>
<td><strong>Concepts</strong></td>
<td>• L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• L, S</td>
</tr>
<tr>
<td><strong>Supervisory</strong></td>
<td>• Problem solving a difficult passage</td>
<td>• P, C &amp; L</td>
</tr>
<tr>
<td></td>
<td>• Playing through an entire piece of music</td>
<td>• P, C &amp; L</td>
</tr>
<tr>
<td></td>
<td>• Creating goals to complete piece in time frame.</td>
<td>• P, C &amp; L</td>
</tr>
<tr>
<td></td>
<td><strong>Links to Music Gaming</strong></td>
<td>• P, C &amp; L</td>
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<tr>
<td></td>
<td><strong>Links to NSW 7-10 Music Syllabus</strong></td>
<td>• P, C &amp; L</td>
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<td></td>
<td><strong>Concepts</strong></td>
<td>• P, C &amp; L</td>
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<tr>
<td></td>
<td></td>
<td>• D, Pi, T, S</td>
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<td>• N/A</td>
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<td></td>
<td></td>
<td>• N/A</td>
</tr>
</tbody>
</table>
Appendix B

University of Wollongong

APPROVAL after review
In reply please quote: HE12/018
Further Enquiries Phone: 4221 3386
MR:SH

22 February 2012

Mr Kyle Little
PO Box U34
WOLLONGONG NSW 2500

Dear Mr Little

Thank you for your letter responding to the HREC review letter. I am pleased to advise that the Human Research Ethics application referred to below has been approved.

Ethics Number: HE12/018
Project Title: Investigating 12-14 year old’s experiences with music gaming technology
Researchers: Mr Kyle Little, Dr Steven Capaldo
Approval Date: 22 February 2012
Expiry Date: 21 February 2013

The University of Wollongong/Illawarra Shoalhaven Local Health District Social Sciences HREC is constituted and functions in accordance with the NHMRC National Statement on Ethical Conduct in Human Research. The HREC has reviewed the research proposal for compliance with the National Statement and approval of this project is conditional upon your continuing compliance with this document.

A condition of approval by the HREC is the submission of a progress report annually and a final report on completion of your project. The progress report template is available at http://www.uow.edu.au/research/rso/ethics/UOW09385.html. This report must be completed, signed by the appropriate Head of School, and returned to the Research Services Office prior to the expiry date.

As evidence of continuing compliance, the Human Research Ethics Committee also requires that researchers immediately report:

• proposed changes to the protocol including changes to investigators involved
• serious or unexpected adverse effects on participants
• unforeseen events that might affect continued ethical acceptability of the project.

Please note that approvals are granted for a twelve month period. Further extension will be considered on receipt of a progress report prior to expiry date.

If you have any queries regarding the HREC review process, please contact the Ethics Unit on phone 4221 3386 or email rso-ethics@uow.edu.au.
Appendix C

Faculty of Education
University of Wollongong

Participant Consent Form

Research Project: Musicianship and Gaming: investigating adolescents’ experiences

Researcher: Kyle Little

Parent/Primary Caregiver Consent:
I have been advised that my child has been invited to participate in a research project. I have had the opportunity to ask any questions about the project and my child’s involvement in the project with the researcher, Kyle Little and/or Dr Steven Capaldo. I also understand that my child has had the opportunity to discuss the project with the researcher Kyle Little, Dr Steven Capaldo and myself. I have also been provided with information about this research project in a parent information sheet.

I understand that:

- Signing this consent form does not guarantee my child a place in the study.
- My child has filled out and provided a personal information sheet.
- A series of interviews and observations will take place in your home.
- My child will be asked a series of questions relating to their experiences with Guitar Hero and/or Rock Band.
- All interviews will be audio taped.
- My child will be observed playing Guitar Hero and/or Rock Band.
- I will be present for all observations and interviews.
- My child or myself will not be able to be identified in any way.
- My child’s participation in this research is voluntary and that he/she is free to withdraw from the research at any time up until indentifying features are removed and data analysis starts.
• Material will be used in a thesis, with the possibility of use in educational journals and as part of presentations at educational conferences.

• My child will receive a $50 Coles Group & Myers gift card for their time and participation in the study.

I also understand that if I have any inquiries about the research I can contact Kyle Little (42215249) or Dr Steven Capaldo (42214616). If I have any complaints regarding the manner in which the research is or has been conducted, I can contact the Complaints Officer, Human Ethics Department, University of Wollongong on (02) 4221 4457, rso-ethics@uow.edu.au.

-------------------------------------------------------------------------------------------------------

By signing below I am indicating my consent for my child ____________________________(name) to participate in the research project as described to me.

Date:_________________ Name (Please print):________________________________

Signature - Parent/Guardian: ______________________________

Signature - Participant: ______________________________

Home/Mobile Telephone No: _____________________________

Email Address (optional): _____________________________

Kyle Little          Dr. Steven Capaldo
Master of Research Candidate Faculty of Education
Faculty of Education scapaldo@uow.edu.au
rkml778@uowmail.edu.au 0242 214 616
M: 0402 092 804
Appendix D

Faculty of Education
University of Wollongong

Participation Information Sheet For Children

Dear Student,

You are being invited to take part in a project with the University of Wollongong. The project is called Musicianship and Gaming: Investigating Adolescents’ Experiences. The purpose of this research is to investigate your experiences with Rock Band and/or Guitar Hero and examine how these games may impact your musicianship. In order to be considered for this research project, you must first meet the following criteria:

1. Own a legal copy of Guitar Hero and/or Rock Band.
2. Have had at least six months experience with Guitar Hero and/or Rock Band.

What will you be asked to do?
If you choose to participate, two 30 - 45 minute interviews will take place in your home under the supervision of your parents and/or guardians. During the interviews you will be asked questions about your experiences with the Guitar Hero and/or Rock Band games. The interviews will be recorded using a digital recording device. Typical questions include: How would you describe your time with the game? Do you find any aspects of the game challenging? What have you learned from playing this game? Additionally you will be observed playing the Guitar Hero and/or Rock Band game(s) for about 15 minutes in order to better understand how you are using the game in your home.

Apart from the 45 minutes of your time for the interview and 15 minutes for the observation, we can foresee no risks for you. Your involvement in the study is voluntary and you may withdraw your participation from the study at any time. Refusal to participate in the study will not affect your relationship with the University of Wollongong.

What will the findings of the research be used for?
The findings from this research will be published in a thesis, perhaps educational journals and used to present at conferences. We will not use your name, you parents and/or guardians name so you will not be identified in any way. This means you will be anonymous and your identity confidential.

Only six people will be selected to participate in the study. If you are selected for the study, your parents will be contacted by phone. Each participant will receive a $50
Coles Group & Myer gift card for his or her time and participation in the study. If you are interested in being a participant please fill out the personal detail sheet and have your parents fill out the participant consent form.

Ethics Review and Complaints
This study has been reviewed by the Human Research Ethics (Social Science, Humanities and Behavioural Science) of the University of Wollongong. If you have any concerns or complaints about the research you can tell your teacher and/or parents or contact the University Ethics Officer on (02) 4221 4457, rso-ethics@uow.edu.au.

Thank you for your interest in this study. If you have any further questions about the research project and/or interview process, please feel free to contact us by phone or email.

Yours sincerely,

Kyle Little
Master of Research Candidate
Faculty of Education
rkml778@uowmail.edu.au
M: 0402 092 804

Dr. Steven Capaldo
Faculty of Education
scapaldo@uow.edu.au
0242 214 616
Dear Parent/Guardian,

Your child has been invited to take part in a project with the University of Wollongong. The project is called *Musicianship and Gaming: Investigating Adolescents’ Experiences*. The purpose of this research is to investigate adolescents’ experiences with *Rock Band* and/or *Guitar Hero* and examine how these games may impact their musicianship. In order to be considered for this research project, your child must first meet the following criteria:

1. Own a legal copy of *Guitar Hero* and/or *Rock Band*.
2. Have had at least six months experience with *Guitar Hero* and/or *Rock Band*.

What will you and your child be asked to do?
If your child chooses to participate, two 30 - 45 minute interviews will take place in your home under your supervision. During the interviews your child will be asked questions about their experiences with the *Guitar Hero* and/or *Rock Band* games. The interviews will be recorded using a digital recording device. Typical questions include: How would you describe your time with the game? Do you find any aspects of the game challenging? What have you learned from playing this game?

Additionally your child will be observed playing the *Guitar Hero* and/or *Rock Band* game(s) for about 15 minutes in order to better understand how he or she is using the game in your home.

Apart from the 45 minutes of your child’s time for the interview and 15 minutes for the observation, we can foresee no risks to your child. Your child’s involvement in the study is voluntary and your child may withdraw their participation from the study at any time. Refusal to participate in the study will not affect your child’s relationship with the University of Wollongong.

What will the findings of the research be used for?
The findings from this research will be published in a thesis, perhaps educational journals and used to present at conferences. We will not use your name or your child’s name so you will not be identified in any way. This means you and your child will be anonymous and identity confidential.
Only six people will be selected to participate in the study. If your child is selected for the study, you will be contacted by phone. Each participant will receive a $50 Coles Group & Myer gift card for his or her time and participation in the study. If your child is interested in participating, please fill out the participant consent form and have your child fill out the personal detail sheet.

*Ethics Review and Complaints*
This study has been reviewed by the Human Research Ethics (Social Science, Humanities and Behavioural Science) of the University of Wollongong. If you have any concerns or complaints about the research you can contact the University Ethics Officer on (02) 4221 4457, rso-ethics@uow.edu.au.

Thank you for your interest in this study. If you have any further questions about the research project and/or interview process, please feel free to contact us by phone or email. Please note that your contact information was supplied by the administrative staff at The Illawarra Grammar School.

Yours sincerely,

Kyle Little                                           Dr. Steven Capaldo
Master of Research Candidate                        Faculty of Education
Faculty of Education                                 scapaldo@uow.edu.au
rkml778@uowmail.edu.au                               0242 214 616
M: 0402 092 804
Appendix F

Faculty of Education
University of Wollongong

Personal Detail Sheet

Name: ____________________________    Age: ____________     Gender:________

What instrument(s) do you play?_____________________________________

Are you currently taking private instrumental/vocal lessons? __________

How many years have you played?_____________________________________

How long have you played *Rock Band* and/or *Guitar Hero*?_____________

All information on this sheet will remain confidential and will be stored in a locked
and secured area. In the event you are not selected to participate in this study, this
information will be destroyed.

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Appendix G

Interview Questions

Background Information
1. What do you like doing in your spare time?
2. What kinds of music do you like listening to?
3. What kinds of video games do you like playing?
4. What are your favorite subjects in school?
5. Do you participate in music at school?
6. Do you play any instruments?
7. Do you participate in any afterschool activities?

Gameplay
1. When you play this game, how long do you usually play for?
2. How did you find out about this game?
3. When did you get the game?
4. Do a lot of your friends play the game as well? Do you ever play against each other?
5. Have you ever played with your parents or other family members?
6. What instruments do you play on? (If applicable)

During Gameplay
1. What do the coloured dots mean?
2. How do you know when to press the buttons?
3. What do all these lines mean that are scrolling down the screen?
4. How do you know when to use the whammy bar?
5. What’s your favourite song in this game?
6. What parts of the game do you find hard?

Perceptions of Music
1. What do you usually do in music class?
2. What is your favourite/least favourite thing about music class?
3. What do you think music is about in school?
4. Have you ever heard your teacher talk about the elements of music?
5. What instruments have you played in school?

Music Game Elements
1. If a teacher were to bring this game into the music classroom, what would you think about that?
2. Why do you think a teacher would bring this game into the classroom?
3. How do you think your teacher would use this game to teach you music?

Closing
1. Is there anything else you would like to talk with me about before we are done?
Appendix H

Participant Follow-up Interview Questions

Chris Follow-up Interview Questions

Background
1. I wanted to ask you a little bit about your family. Are they musical? Do they involve themselves in music a lot?

2. You said that you liked to play computer games. What other computer games do you like to play? What do you like about GTA?

3. I was talking to you about whether you use the playstation and wii a lot, and you said 'sort of'. How often would you say that you use it during the week?

4. You were talking about the differences between the Playstation and Wii. You mentioned the controllers and how wii is more like if you were playing tennis or something. Is there a make pretend element you like about it?

Music Class Background
1. I asked you if you found music class boring. What do you find boring about music class?

2. You said that you enjoy writing music in music class. Do you ever write your own music at home?

3. Can you tell me a little more about what you are learning in your drum lessons? Are there any things that your teacher focuses on? Do you know how to read music (What style?)

4. You said that music is about expressing yourself. You said that you can express yourself by writing music and playing instruments. How does playing an instrument allow you to express yourself?

5. What do you think music is about in school? What do you think music should be about in school? Why is it important to express yourself?

6. Why do you think imagination is important part of music?

Guitar Hero Background
1. You mentioned that you usually play guitar hero when you're bored. Why do you think that is?

2. Your mom mentioned that when you first got the game, it was hard to get you off of it. What was it about that game that made you want to play it?

3. When you and your family (uncle Bill) play the game, what do you usually do? Who plays on what instruments? Do you talk with each other when playing?
4. You mentioned how light the instrument controller is. Do you like that aspect of the instrument controller?

5. You said that the instrument controller is a bit different from a real instrument, how do you think it's different?

6. What do you think is the most realistic instrument controller?

7. You mentioned that the notes that you see on the screen are like music notes. How do you think they are like music notes?

8. I was talking to you last time about these lines or bars that are scrolling down the screen along with the notes. I am wondering if you have had a chance to notice them before? (use the game if he has not)

9. I was talking to you about your pedal technique when playing the drums. You said that you had to know the beat to know how to use it. Do you think that is the same when you play Guitar Hero?

10. You said that Guitar Hero could teach you team work, how would it do that?

**Guitar Hero**
1. How are you able to express yourself in Guitar Hero? Are you able to be imaginative?

2. How do you play Guitar Hero?
   a. Are you creating the sound of the instruments?

3. Why do you like Guitar Hero?
   a. You said that games are like another world, does guitar hero put you in another world?

4. How do you think your prior musical training has impacted how you play the game?

5. Do you think you can learn to be better at this game? How do you think you could do that?

6. Do you think you are good at the game?

7. When you are playing the game, what kinds of songs do you play?
   a. Why do you play those songs?
   b. What is it about these songs that you like?
   c. Do you ever listen to these songs during your free time (ipod, etc.)?
      Then why do you choose these songs?

8. How does playing a song that you know make it easier to play?

9. Do you ever play songs that you don’t know?
a. Do you ever try to teach yourself songs?
   b. Do you ever get any help from your siblings?

10. When you are playing the game what are you listening to?

11. How did playing real guitar and drums prepare you for playing the Guitar Hero game?

12. When you are playing the game do you feel like you are performing? What about the game makes you feel that way?

13. Have you had a chance to compose a piece of music on guitar hero?

**Playing an unknown song**
1. What was it like to play a song you don’t really know?
2. When you were playing, what were you focusing on?
3. What was hard/easy about playing a song you don’t know?
Tim Follow-up Interview Questions

Background Information

1. You said before that you like playing Grand Turismo. What do you like about that game?
2. You said before that you think the Wii is no longer cool, why do you think that?
3. When you are doing your homework, what other technology do you have on or use?
4. What kinds of songs do you like listening to right now? What are some of your favorite songs?
5. What can you tell me about Dubstep? What makes this music cool? Who are some of your favorite artists that you listen to?
6. How long have you been making games for? What got you interested in making or knowing how to make games?

Music

1. What do you think music is about? What do you think makes up music?
2. Have you ever heard your teacher talk about the elements of music?
3. What do you think are the cool parts of music? What do you think makes good music? What are the things that interest you about music?
4. You said before that you like composing music on the music programs. How long have you composed music for? How often do you do it? What kinds of things do you compose? What sorts of things do you need to know in order to play music?
5. Why do you like the format of FLN studios?
6. You mentioned before that you can play some songs on the piano. How did you learn how to play those songs? Did someone teach you, or did you figure them out yourself?
7. You said before that when you don’t really understand something in music class, you don’t really care. Why do you think that is?

Previous Gameplay Questions:

1. When you are playing the game, and miss a note how do you get back on track?
2. You said that usually you can play the game better when you get used to it. What do you get used to?
3. Why do you like long streaks?
4. How often would you say that you play Guitar Hero now?
5. You mentioned that the singing line annoys you, what is annoying about it?
6. When you are playing a song, what part are you focusing on to know when to play the notes correctly?
7. What don’t you like about the singing track?

New Questions:

• Fix the audio so Tim can hear the guitar more closely.
• After finishing the game ask him these questions:

1. How do you play guitar hero?
2. How is the controller like a real guitar? (drums, etc.)
3. What were your initial impressions of Guitar Hero?
4. What do you like about Guitar Hero? Why do you still play the game?

**GH Mix**

Get Tim to play the song he wrote using GH Mix. Then ask him:

1. How did you compose you piece of music?
2. Explain how you use the composing program.
3. What influenced your composition?
Terry Follow-up Interview Questions

Background

1. You mentioned to me that you like the Jumbalaya Trio. What do you like about that band? What do you like about the Foo Fighters?

2. You mentioned to me that you wanted to learn the drums. Why is that?

3. In music class in your old school, you said that your favorite thing about music class was ‘doing what you liked’. Was there a lot of time in music class to play your instrument by yourself? What was the teacher doing that allowed you to do that?

4. We were talking about why you like music, and you told me that you like how music has different moods. When you play guitar hero, does it put you in different moods?

5. Have you ever heard your music teachers talk about the elements of music?
   a. What do you think are the elements of music?
   b. Do you think there are any elements of music in the game?

Guitar Hero

2. How do you play Guitar Hero?
   a. Are you creating the sound of the instruments?

3. You said before that you have learned to read guitar TAB. Do you think there are any similarities between Guitar TAB and the on-screen notation in the game?

4. Why do you like Guitar Hero?
   a. You mentioned before that you feel free when you are playing the game. What aspects of the game make you feel ‘free’?
   b. You said that you like the competition aspect of the game, do you ever compete against yourself?

5. How do you think your prior musical training has impacted how you play the game?

6. Do you think you can learn to be better at this game? How do you think you could do that?

7. Why do you think you are good at this game?

8. When you are playing the game, what kinds of songs do you play?
   a. Why do you play those songs?
   b. What is it about these songs that you like?
c. Do you ever listen to these songs during your free time (ipod, etc.)? Then why do you choose these songs?

9. How does playing a song that you know make it easier to play?

10. Do you ever play songs that you don’t know?
    a. Do you ever try to teach yourself songs?
    b. Do you ever get any help from your siblings?

11. What is it like to only have one guitar controller? Do your family members and siblings take turns?
    a. What do you usually do when others are playing the game?
    b. Do you ever fight over who gets to play next?
    c. How is playing with your friends different from playing with your brother and sister?

12. You mentioned that you have tried to play the game with the x-box controller. What do you have harder about playing it on the controller? How is it different from playing on the Guitar Controller?

13. When you are playing the game what are you listening to?
    a. You mentioned before that you mainly listen to the rhythm and that sometimes you don’t really know what you are pressing. Can you tell me more about this?

14. What is the main difference between Guitar Hero 2 and Guitar Hero 3?

15. How did playing real guitar prepare you for playing the Guitar Hero game?

**Playing an unknown song**

4. What was it like to play a song you don’t really know?
5. When you were playing, what were you focusing on?
6. What was hard/easy about playing a song you don’t know?
Eva Follow-up Interview Questions

Background

1. You mentioned that it was weird that you are taking music next term, why do you think that is weird?

2. You have played a number of different instruments. Why do you think you have started and stopped so many times? Did your parents ever convince you to continue?

3. You mentioned before that a lot of girls don’t play video games? Why do you think that is? Do you think a lot of girls play video games?

4. How do you think your prior musical training has impacted how you play the game?

5. You mentioned that you like playing the game when your brothers play. What happens when you are all taking turns playing the game? Do you like watching your bothers play? What are you doing when someone else is playing the game? Why do you like hanging around with your bothers while they play the game?
   a. Do you guys ever fight over who gets to play next?

Playing Rock Band

1. You mentioned that you play Rock Band whenever you go over to your friend’s house. What is it about Rock Band that always makes you want to play it when you go over?

2. What instruments do you play when you are playing Rock Band?
   • Why are drums your favorite?
   • What is it about the drum controller that interests you?
   • How is playing the drum different from playing the guitar?

3. What is it like to play in a group?

4. How is it different from playing by yourself at home?

General Questions

1. How do you play Guitar Hero and/or Rock Band?

2. Have you ever played the game not using the instrument controller?
   a. What is different about it? Do you find it hard?

3. Why do you like playing Guitar Hero or Rock Band?
4. When you are playing the game, what kinds of songs do you play?
   a. Why do you play those songs?
   b. What is it about these songs that you like?
   c. Do you ever listen to these songs during your free time (ipod, etc.)?
      Then why do you choose these songs?

5. How does playing a song that you know make it easier to play?

6. When you are playing the game are you listening?
   • What are you listening to?

7. If the notes in the game are going really fast, do you ever try to figure them out?
   What do you do when you are playing a section that you don’t know?

8. How do you play the coloured notes?

9. You mentioned that it is more fun to play songs like you were in a concert or show? What do you mean by that?
   • When you play, do you imagine as if you were playing in a rock band?

10. What do you think about the screen format? What is going on the screen when you are playing? Are you watching anything else on the screen when you play? Do you like watching the screen when you are not playing?

11. Do you ever play songs that you don’t know?
    a. Do you ever try to teach yourself songs?
    b. Do you ever get any help from your siblings?

12. What is the main difference between Guitar Hero 2 and Guitar Hero 3?

**Playing an unknown song**

1. What was it like to play a song you don’t really know?
2. When you were playing, what were you focusing on?
3. What was hard/easy about playing a song you don’t know?
Chelsea Follow-Up Interview Questions

Background
1. What kind of music do you like listening to?
2. What kind of technology do you have around the house?
3. What instruments have you played in school?
4. In your AMEB music theory exam, what was the subject matter? Can you tell me about what you learned for your exam?

Guitar Hero Background
1. You mentioned that Guitar Hero made you want to play the drums. How did Guitar Hero make you want to play the drums?
2. Why is Barracuda your favourite song?
3. What is it like to play Guitar Hero with your brothers?
4. How do your brother's help you when you get stuck in Guitar Hero?
5. When you and your brothers fight over the game, what are you usually fighting about? Why does your brother try to steal the guitar off of you?
6. Can you explain again why you find it easier to play the guitar controller on the Wii console?
7. Why do you play through all of the songs in Guitar Hero?
8. Why do you think singing while playing the game helps you to concentrate?
9. Why do you like playing competitively against the computer? Do you play against your brothers?
10. I talked to you about how they show rhythm in Western music and Guitar Hero. How would you indicate rhythm in Western music? How do you write rhythmic notes? Now how do they show that in Guitar Hero?

Guitar Hero
14. How long have you had Guitar Hero?
15. Why do you like Guitar Hero?
16. How do you play Guitar Hero?
   a. Are you creating the sound of the instruments?
17. How are you able to express yourself in Guitar Hero? Are you able to be imaginative?
18. How do you think your prior musical training has impacted how you play the game?
19. Do you think you can learn to be better at this game? How do you think you could do that?
20. Do you think you are good at the game? Why is that?
21. When you are playing the game, what kinds of songs do you play?
   a. Why do you play those songs?
   b. What is it about these songs that you like?
   c. Do you ever listen to these songs during your free time (ipod, etc.)? Then why do you choose these songs?
22. How does playing a song that you know make it easier to play?

23. Do you ever play songs that you don’t know?
   a. Do you ever try to teach yourself songs?
   b. Do you ever get any help from your siblings?

24. When you are playing the game, what are you watching on the screen?

25. When you are playing the game what are you listening to?

26. When you are playing the game do you feel like you are performing? What about the game makes you feel that way?

27. Have you had a chance to compose a piece of music on guitar hero?

Playing an unknown song
4. What was it like to play a song you don’t really know?
5. When you were playing, what were you focusing on?
6. What was hard/easy about playing a song you don’t know?
Appendix I

Summary of Interviews

Chris

First Interview

During the first interview, Chris and the researcher sat on chairs facing one another next to the gaming area of the room. Chris' mother was also in the room observing the interview process, and at times elaborated on some of Chris' responses. The first interview with Chris focused on his background with music, school and other activities.

The first interview began with asking Chris some general questions about what he enjoys doing in his spare time. Chris responded that he liked spending time playing with his friends either outside or on video games, and playing the musical instruments in his home. Chris participated in an after-school extended art class in which he uses software to create movies and animations. He also expressed an interest in musical theatre, indicating that he had performed in local professional and amateur productions. At the time of the study Chris was taking private drum lessons, but not involved in any other music afterschool activities at his school. He indicated that he was interested in participating in the school musical, but would have to wait until the following year because of a school rule prohibiting Year 7 students participating in productions.

The interview then focused specifically on Chris' musical experiences at home and at school. Chris was first asked questions about what he is learning in his drum lessons. In general, Chris explained that he is learning about drumbeats and how to play fills. Chris demonstrated his understanding of fills and drumbeats on his drum kit, and using the Guitar Hero drum controller. Chris described his experiences with his music class at school. Chris was not interested in what he was learning in class. Chris was learning how to play songs like Ode to Joy on the keyboard. This was not interesting for him, as he found it very restrictive, limited by specific rules set out by the teacher. Instead, Chris enjoyed music class when he was able to compose and perform, which
he said did not happen frequently. He felt that his music class was missing the most important aspect of music, which was being creative through musical expression. In order to do this, Chris suggested that the teacher should allow students to compose and perform more on instruments that they play in their spare time.

When asked about why he thought music was taught at school, Chris explained that school music helped students to learn how to read music, learn about the history of music and learn how to express themselves through music. It seems that in Chris' eyes, his music class has fallen short in teaching him how to express himself through music. Chris was also asked to describe the concepts of music he is supposed to be learning about in his music class. The reason for these questions was to establish Chris' level of formal musical knowledge so that it may be drawn upon when asking specific questions about Guitar Hero. Chris explained that music is made up of sounds put together with a beat and a tempo. In the second interview, the participant provided a few more details, but overall he seemed to find it difficult to describe what he was thinking.

Half way through the first interview, Chris was asked to play Guitar Hero while the researcher observed. Chris played on the guitar and drum controller and chose a medium difficulty setting for both controllers. The participant demonstrated a proficient sense of rhythm, which he attributes to his musical upbringing as well as his drum lessons. Additionally, he stated that he is able to transfer the skills he has learned from playing guitar and drums to the Guitar Hero game. Chris was able to relate some concepts of the game to musical concepts he has either learned at home or in his private drum lessons. These concepts include the use of notation and rhythm in the game.

After playing the game, the participant was asked a series of question that related to how he plays and views the game, while additionally focusing on some of the musical concepts that he described previously. Chris was able to explain how to play the game using the instrument controllers, focusing specifically on rhythm and the on-screen notation system of the game. He described how each coloured note in the game represented each of the coloured buttons or pads on the guitar and drum controller. Chris was then asked about the bars that scroll down the screen with the on-screen notation, however he was unable to remember seeing them. Chris also mentioned
during the interview that he believes there is a free and expressive element to playing *Guitar Hero*. He explained that while using the drum controller, he is able to incorporate fills and other concepts he has learned in his drum lessons in the game that allows him to be expressive. Furthermore, he explained that just playing a song is a way for him to express himself.

Later in the first interview Chris compared the instrument controllers to authentic instruments that he has played. According to the participant, he found using the guitar controller was easy for him, because it was very similar to an authentic guitar. When asked to elaborate, Chris stated that it was similar in the way that he is able to strum using the strumming controller, the position of his fingers along the fingerboard and the use of the whammy bar to manipulate the sound of the instrument controller. However Chris did not find that the drum controller was similar to an authentic drum kit. This had to do with the size of the drum controller and the position of the drum pads in relation to where they would be on an authentic drum kit. For example, Chris pointed to the upper left most drum pad, indicating that this was supposed to represent the high hat. Therefore, it should be moved more to the left and positioned closer to the side of the player.

At the end of the interview Chris was asked what his impressions would be if a teacher were to bring *Guitar Hero* into the classroom. Chris was very enthusiastic about the idea, stating "games are fun, and music's fun. Put them together" (Chris, Interview 1). He was then asked to explain how he thought the game could be used in a music class. Chris explained that the game could be used to teach students about the timing or rhythm of music, and to give students an initial sense of playing a musical instrument. Additionally, Chris discussed how the game could teach students about team work as the game can involve multiple people playing the game at the same time. Chris was then asked to elaborate his opinion about why a music teacher may bring the game in the classroom:

Researcher (R): So why else do you think the teacher would bring this into the classroom?

Chris (C): 'Cause it's music.

R: What is it about this game do you think that makes it music?
C: 'Cause you're playing music but not really.

R: Okay, are you creating the sound that's coming out of the television?

C: Yeah.

R: Okay, so you're playing the instruments that you're hearing?

C: Yeah. (Chris, Interview 1)

In this instance Chris was unable to clearly compare the difference between creating sound on an authentic instrument to creating sound in the game using the instrument controllers. Additionally, Chris believes that he is actually responsible for playing the professional sounds heard through the television speakers, however this may be due to lack of experience on his part or not clearly understanding the question.

**Second Interview**

The researcher transcribed the first interview and began coding the data looking for major themes that arose. From the first interview the researcher uncovered four themes and subthemes: 1) Game Usage, 2) Playing an authentic instrument versus an Instrument Controller, 3) Educational opportunities with *Guitar Hero*, and 4) *Guitar Hero* versus Playing authentic music. The researcher then took these themes and formulated a new set of questions, as well as questions that elaborated on some of the ideas that the participant brought forth in the first interview. The interview took place in the same play area under the supervision of the participant's mother.

The researcher first wanted to know more about why Chris did not play video games as often anymore in order to establish a potential pattern of use. The participant described that when he first got the game, he would play it often. However as Chris has gotten older his interests have change, and therefore the game no longer holds Chris' interest. As Chris stated, he would much rather go outside to play with his friends than sit inside playing video games.

The conversation then moved to his education at school, specifically asking questions to get Chris to elaborate what he does in his two Creative Arts classes (Music and Art). Chris reiterated that he found music class boring due to its restrictive nature, in
that he can only play specific instruments or specific music, and that everything he
does in class is surrounded by specific rules which he finds limits his creativity and
expressive nature. However, Chris stated that this restrictiveness was not apparent in
his Art class. He explained that this was due to the way in which the teacher taught
the class, by first teaching the concepts then allowing the students to apply the
concepts to creating their own piece of art.

The researcher wanted to know more about what Chris meant by being expressive
while playing music. Therefore the researcher asked the participant how playing a
musical instrument allows him to express himself. He stated that it allows him to
"freestyle", meaning that he is able to go outside the realms of the written music and
improvise on the drum controller. The researcher then moved on and asked the
participant whether it was possible for him to be expressive through playing *Guitar
Hero*. He indicated that he is able to be expressive through his song choices, as well
as his ability to add fills while he played on the drum controller. This was however
not the same when Chris used the guitar controller.

Social gaming was a point that Chris brought forth in the first interview. The
researcher wanted to know a little bit more how he plays the game with his family.
The participant discussed how each of his family members had their own instruments
that they enjoyed playing, and how they are positioned around the play area while
playing the game. Additionally, Chris described that playing the game as a family was
almost like being part of a family band. When Chris first got the game, he and his
family would often play the game together, but as time has progressed both Chris and
his family have lost interest in playing the game as a family.

The interview moved on to discussing specific musical concepts that were outlined in
the first interview. Chris described that the on-screen notation were like notes in
music (or Western notation). The researcher wanted to know how the on-screen
notation related specifically to musical notes in music. The participant described that
each of the colours represented a specific pitch level explaining that the green note in
the game represented a lower sound. He further added that listening to the beat
patterns in the songs and watching the on-screen notation hit the play line represented
a form of rhythm.
The researcher brought up the idea of performing with the participant in order to see whether the participant could relate parts of the game to the Learning Experiences in the NSW BOS Year 7-10 Music Syllabus (2003). The researcher wanted to know whether the participant felt like he was performing while playing the game. Chris stated that he believed that he was performing when he first played the game, however this opinion changed when he experienced performing first hand in front of a large audience. He described the emotional differences between playing the game and playing on stage, focusing on the nervousness and apprehension that accompanied performing in front of a large audience. Chris then described that when he played the game with his family members, he felt more as if he were part of a band playing on stage due to the fact that each person was playing a different instrument and reading different on-screen notation.

Composing and Listening are the other two Learning experiences in the music syllabus. When asking Chris about what he listens to when he plays the game, he stated that he listens to the various rhythms and sounds in the game and is able to anticipate what comes next in the song just as long as he is familiar with it. Chris believed that listening is a very big part of playing the game. For composing, Chris did not "have time" to look at the composing program, and therefore did not get to explore it. However, he is very interested in composing music, and was very interested to find out that there was a composing program for Guitar Hero.

Chris believed knowing a song before playing it in the game makes the game much easier to play, due to the fact that he would know the melody and rhythm. He also made mention of knowing the song structure (referred to as "how the song goes" - Chris, Interview 2).

The interview concluded with asking Chris to play a song he was unfamiliar with. This was to establish whether Chris was able to use some of his skills with playing music on authentic instruments to playing the game. The participant chose a song by Sum 41 on a medium level of difficulty using the guitar controller. When playing through the song the first time, Chris was able to complete the first verse, however when the song moved on to the chorus, he was unable to keep up with the rapid chord changes and eventually failed the song. The participant tried the song a second time to try and complete the song. He was able to get past the first two verses and the chorus,
however when the bridge of the song came in, Chris was unable to keep up with the complex number of notes.

Chris has a very unique perspective due to his families experience with music. However, during a much of the interviews he found it difficult to express himself, worrying that he was giving a wrong answer rather than having a conversation. When asking open-ended questions like "why do you learn music at school", many of the answers would give were "I'm not sure". Near the end of the second interview, Chris was getting impatient and could not think of the answers to the interview questions. Therefore, the researcher frequently moved on to the following question in order to keep the participant's attention and enthusiasm about participating in the interview.

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**Tim**

*First Interview*

During the first interview the researcher and participant sat on the two couches facing each other. Tim's mother sat downstairs, but came up periodically to see how the interview was progressing. Similar to the other interviews, the first interview focused on Tim's background with school, afterschool activities and video game experience.

The interview began with asking Tim some general questions about his interests and background. Tim enjoys listening to music, and will often listen to the Top 100 on the local radio station. In his spare time, he likes to design race cars using a simplistic 3D modelling computer program, as well as compose music on his computer. Through the graphic design courses he has taken at UOW, he hopes to one day be a graphic designer for a video game company.

Tim continually expressed his dissatisfaction with his music class at school. During the time of the first interview, Tim was learning how to sing nursery rhymes in class. He had spoken with the teacher regarding learning more recent forms of music, however according to Tim, this was something the teacher was not interested in doing. Nonetheless, he was very knowledgeable with what he had completed in class, explaining that he had learned about time signatures, rhythms, completed rhythmic
dictations and learned how to compose music. He was excited for music next term, as he would be learning how to play the piano.

The researcher moved on and asked the participant about why he thought he learns music in school. Tim stated:

> Just to give us a different perspective, and learn a subject. So like if you didn't know anything about music, and you like listening to music and you'd say it was like heaps cool but you didn't know why it was heaps cool. So yeah I know like the beat. I love the beat or I like the rhythm. So I know that because of music otherwise I wouldn't have cared, and then I would try to figure it out but I wouldn't. (Tim, Interview 1)

The researcher wanted to know more about how learning music was able to give Tim a different perspective in order to set the stage to ask whether Tim could make the connection between music and video games. Therefore, the researcher asked whether he could make connections with what he learns in music to his other classes. He explained: "sometimes in maths, like when you're adding up the beats in the bar, and then you kinda need maths for that and vice versa." (Tim, Interview 1)

The interview moved on, asking the participant to play a couple of songs on *Guitar Hero* while the researcher observed. Tim played one song on the guitar controller on easy level of difficulty. He was able to play most of the notes in the song but at times made some mistakes. Throughout playing the song, Tim would speak with the researcher, specifically when he would make mistakes.

After the song was completed the researcher asked the participant about how he views playing the game. When Tim plays *Guitar Hero*, he mainly plays on the guitar controller or sings on the microphone. He does own the drum controller, however he doesn't seem to like using it, as he finds it too difficult. When asked about the visual interface of the game, the participant stated that he did not like the microphone controller notation as it moved too sporadically for him to get a sense of where the pitch was. However when asked about the guitar controller notation, Tim linked the coloured dots to specific fingers he uses on the guitar controller and to specific pitches.
Tim feels that he has a unique way of understanding the game. He explained that he is always listening to the beat or rhythm of the song. This helps him to know when to press the buttons at the correct time, rather than focusing more on what is happening on the screen. When asked about the bar that scrolls down the screen along with the on-screen notation, Tim described it as each beat in a bar of music. He felt that this was not something that other people did when they played the game.

Using Guitar Hero in a music classroom setting is something that Tim finds interesting, but does not see it as feasible. When asked what his initial impressions would be if a teacher brought the game into the classroom, Tim responded with "Teacher's gone mental" (Tim, Interview 1). Tim went on to explain that the teachers would need a number of televisions and games in order to allow the students to play, or else the students would be unruly. Tim was then asked what a teacher could teach their students if they were to use it. To which he responded: "Well it's taught me, 'cause I do the beat thing. I know what these are (referring to how he is able to link what he has learned in school to the game)" (Tim, Interview 1). For the concept of pitch, Tim referred to the singing feature of the game: "Yeah, 'cause you got your bar (referring to the moving pitch bar), and then you've got your line maybe here and it's going like that (arm moving) and you can see that you have really high pitch or really low" (Tim, Interview 1). However, Tim did not believe that the guitar controller and guitar notation was able to teach anything about pitch: "'Cause you hear the song, but you don't hear actual guitar, like when you get one wrong it makes a 'doing' noise that you got something wrong but you can't actually hear your guitar" (Tim, interview 1).

Tim was not aware about the volume function in the game that allows him to increase the volume for each instrument. In that quote he was also referring to his ability hear exactly what he plays or sings when he uses the drum or microphone controller.

The first interview concluded with Tim showing the researcher about the composing feature in his version of Guitar Hero called GH Mix. He demonstrated all the features of the program, while using some music terminology. For example, the researcher asked what the numbers located near the middle of the screen where the on-screen notation was inputted using one of the instrument controllers. Tim stated that these were "your bars" similar to that in music. Tim finally recorded a brief melody using the guitar controller to show the researcher how to input and play a composition. The
researcher then gave a task to the participant to compose a piece of music using *GH Mix* so that he can demonstrate and discuss the composition process in the second interview.

**Second Interview**

After transcribing the first interview, the researcher performed a thematic analysis through coding. The following themes around: 1) game usage, 2) social gaming, 3) musical elements and *Guitar Hero*, and 4) song familiarity were found. The researcher then took these themes and formulated a new set of questions surrounding the themes, as well as created questions that further examined the participant's background with music and video games. Additionally, some of the interview questions focused on the Learning Experiences in the NSW: BOS Music Syllabus. The interview took place in the same play area while the participant's mother and stepfather stayed downstairs.

The interview started with asking questions about Tim's experiences with playing some of the video games he mentioned in the first interview. The researcher wanted to know why he enjoyed playing these games, in order to make the link to why he enjoys playing *Guitar Hero*. Tim explained that enjoys the games as they have a pretend element to them. When discussing why he likes his race car games he stated: "Because they're fun and it gives you new experiences and stuff. 'Cause [you] probably won't get to race a car like that" (Tim, Interview 2). The participant is describing that games give him the ability to do things that might not otherwise be possible in real life.

Tim then discussed his love of music, specifically his love of the musical style of *Dubstep*. The researcher, not having much experience with this kind of music, asked the participant to describe it in his own words. He described it as "Crazy and mad" (Tim, Interview 2), further explaining that there are major dynamic differences in the music which included loud bass lines. His favourite artists included in that style are Skrillex and David Guetta. This information was important to know, as those artists and his love for *Dubstep* influenced is *Guitar Hero* composition.

The researcher wanted to know more about Tim's musical knowledge to see if he could make some links to the *Guitar Hero* game. Therefore, the researcher asked Tim
whether he knew what the concepts of music were. The participant was first unsure about the question, so the researcher asked the participant to describe what he thought made up music. Tim described music as: "Purposely meant sounds and that sounds good together" (Tim, Interview 2). The researcher then asked Tim what he thought sounded good together, to which he stated: "A beat with a bit of vocals that make sense" (Tim, Interview 2). Tim went on to explain that when he listens to music, he enjoys the choruses the most. Subsequently, the researcher moved on to discussing Guitar Hero in terms of how he plays the game and how the game could link with some of the Learning Experiences.

In the first interview, Tim explained that he plays a song better when he gets used to it. The researcher wanted to know what Time meant by that. He then explained that he gets used to the durational elements as well as the overall structure of the song. In general, Tim was able to link many musical concepts with the Guitar Hero game that he had learned in school or through informal musical experiences. He spoke mainly about the rhythmic elements of the game, as these are Tim's favourite concepts of music. This could be explained with the fact that his music class has mainly focused on rhythm during the time of the interview. He was able to connect concepts of the bar lines in the game to bars in music and beats in a song, linked the elements of pitch with the coloured buttons (on-screen notation) in the game and talked about simplistic elements of structure as they related to popular songs (e.g. verse/chorus).

Tim was able to connect some of the Learning Experiences in the NSW BOS Year 7-10 Music Syllabus (2003) to the game. He explained that when he plays Guitar Hero, he is mainly listening to the beat and the rhythm of the instruments in order to make sense of the on-screen notation. When asked about performing, Tim stated that the game makes him feel like a rock performer, and gives him the opportunity to perform on a pretend stage, which he might not get to do in real life. Composing was discussed at the end of the interview, when Tim demonstrated his composition using GH Mix.

The researcher wanted to know a little bit more about the songs that Tim chooses to play. Tim likes to either choose songs with a slow or medium tempo, as it gives him time to look at the screen. More specifically, Tim also likes to choose songs that he is familiar with, because he is prepared for the note patterns in the song (he is able to be
more relaxed when playing the game). His song choices are tied in with the possible pretend element of Guitar Hero. He states that he likes to play songs he is able to "rock out" (Tim, Interview 2) on. This possibly means that he is able to feel more like a rock performer. Furthermore, he describes liking longer notes, as he is then able to perform choreographed rock-type of moves that other rock performers do on stage.

Finally, the interview ended with the participant showing the researcher his composition on GH Mix. The researcher wanted to focus on the participant's composition rather than playing an unfamiliar song (as was done during the other participant's interviews) due to time constraints. From the researcher's perspective, the composition had a clear structure with a beginning, middle and end. After listening and reviewing the second interview recording it was clear that there was a definite Dubstep influence. Tim had incorporated a guitar, bass guitar and drum part throughout his composition. Additionally, he had used a different style of percussion part, while also including some extended techniques for the guitar part.

Tim then explained his process for composing his piece of music. He started first with the drum part in each section and then would add the guitar and bass part to it. He matched the styles of the guitar and bass parts, so that they their tone colour would match that of the drum part: "I put some bass guitar in because it is a low guitar and it fits the drums" (Tim, Interview 2). Tim also ran into some problems with his composition. He stated that the hardest thing about the program was "Mixing things together", and getting to know how to use the program. He went on to explain: "So like the drums, it sounds really rubbish with the keyboard and some of the things are louder than others" (Tim, Interview 2). Tim was really focusing on making sure that all of the dynamic levels matched the types of instruments used.

Tim thoroughly enjoyed using the program to compose his piece of music. According to Tim, he spent a total of two consecutive days composing. He stated:

Like to be honest I don't think there's been anything like this. Even Garage Band on like the computer is nothing like this. You actually have physical...instruments. They're electronically all wired up to [the game console] and you're just playing it over, and over. (Tim, Interview 2)
Tim was the only participant that used the *Guitar Hero* composing program. He was able to describe the versatile nature of *GH Mix* in terms of composing, inputting notes, and changing the types of instruments in the game. He was able to link some musical elements to the program, like duration, pitch and some elements of structure.

Tim is a very unique person. He has created his own little world in his own personal play area. It is interesting to note that even though Tim has a limited musical exposure in comparison to the other participants, he was able to clearly make the connections between the game and the concepts of music he has learned and experienced.

**Terry**

*First interview*

During the first interview the researcher and the participant sat across from each other. Terry's mother sat just outside of the play area in the kitchen while the interview took place. This interview followed the same protocol as the other interviews with participants. It focused mainly on the participant's background with school, music, afterschool activities and initial experiences with the game.

The researcher asked Terry a series of questions regarding his background with music, video games and school. Terry enjoys alternative music, but does not like listening to recent popular music on the radio as he feels that it sounds too repetitive. When playing video games, Terry enjoys first person shooting games like *Battlefield 3* and *Call of Duty (COD)*. Many of the games that were in the living room he had borrowed from his friends. Terry had not yet involved himself in any afterschool activities as he had just started at School #1 and was still settling in.

The participant had suggested that he had not learned a great deal in music class at his former high school. This was due to the fact that his teacher spent most of his time with the other students who did not know how to play instruments. As a result Terry did not have much to say about his music class. Therefore, the researcher focused more on asking the participant about why he enjoys playing music. To which he explained: "[Music] has different moods. It can make you like happy. Music does stuff that other [subjects] can't. You might be able to speak in words but if you say it
in a song it gives a different message" (Terry, Interview 1). Terry has a very personal relationship with music, which was made apparent when speaking with him. The researcher wanted to see if Terry had the same reaction when playing Guitar Hero.

The researcher then asked Terry to play a song on Guitar Hero in order to observe him playing the game. Additionally, the researcher wanted to get the participant in the frame of mind for answering questions about the game. Terry played through two songs on the guitar controller, both on a medium level of difficulty. He often used the whammy board on the controller to manipulate the sound. One of the songs he chose had multiple metre changes, all of which Terry was able to adapt to quickly as he had played the song before. Additionally, Terry was very strategic when using the star power feature of the game in order to maximise the number of points he received for playing the song. After playing the game, the researcher moved on to ask questions about Terry's views of the game.

Throughout the interview Terry had explained his reasons for liking Guitar Hero. He explained that he enjoys playing the game as he finds it similar to playing the guitar as well as finding it challenging. He went on to say: "It's a pretty amazing game when you think about it how when you press a button it does the sound" (Terry, Interview 1). According to Terry, his brother is extremely good at the game. For that reason Terry and his sister love to sit down on the couch and watch his brother play. Often Terry and his brother and sister would play the game together. Because the family only owned one guitar controller, the three siblings would have to take turns playing the game, while the other family members sat on the couch and watched.

Due to his previous experience with guitar and guitar lessons, Terry was able to make some comparisons between the guitar controller and an authentic guitar. He explained that the guitar was similar in shape, a similar method of left hand finger placement on the buttons and similar strumming patterns on the strumming control. However he noted in the second interview that the two instruments were very dissimilar in terms of the number of possible notes on the instrument controller: "Because it's just not the same, it's a game with five notes [compared] to a guitar that has like 50 notes on it" (Terry, Interview 2). Terry described that he enjoys using the whammy bar on the controller as it made him feel "more professional in a way" when he used it. Terry was also able to transfer some of the skills he learned in his guitar lessons to the
instrument controller such as being able to shift or spread his fingers to the other buttons, and the skill of strumming or picking on the controller.

Terry was able to link some of the concepts of music to the game. First and foremost, he would constantly refer to "the beat and rhythm" when he was asked questions about music and the game. When he listened to the game, he stated that he was mainly listening to the drum part. When asked about the bars that scrolled down the screen, he linked them to pictorial representations of the neck of a guitar. Terry normally chose fast songs, as he found them more challenging. He also liked to play songs he was familiar with. There were times where Terry had been introduced to a song in the game that he enjoyed but he explained that it was rare.

Terry was finally asked for his thoughts on using the game in his music class. He stated: "It's got music in it. And like with the rhythm it's everything I think. That's where it starts, yeah. But I think Guitar Hero would totally destroy everything that you've learned in music, I think." He further added: "Cause it's not real playing music, it's an idea of music. It's not real in a way" (Terry, Interview 1).

**Second Interview**

Through transcribing and then performing a thematic analysis on the data, the researcher wanted to collect more data on Terry's background, specifically more about what he knew about the concepts of music and whether he learned them in school or in his private instrumental lessons. Additionally, the researcher wanted to know more about how Terry compared the game to what he has learned in his private instrumental lessons.

After the first interview Terry had started taking private drum kit lessons. He had mentioned in the first interview that playing the drums was something he was interested in. This mainly had to do with Terry's love for "the beat and rhythm". However, Terry had only taken one lesson during the time of the second interview.

The researcher and the participant continued the conversation regarding music class at his previous school and as well as his interest in music. Terry could only remember learning about duration and rhythmic values at his previous school, however he explained that learned more of the concepts of music in his guitar lessons with his
new teacher. Terry stated in the first interview that he loved the different moods of
music. He went on to add in the second interview that he likes how music allows him
to be able to express himself. The researcher then wanted to know whether he thought
that Guitar Hero allowed him to express himself. He stated: "Yes when it gets to
expert and hard [levels of difficulty]. Because there's more, it's more detailed and it
sounds more to the music. And you feel like you're playing it more" (Terry, Interview
2). In this instance, Terry was referring to how playing on harder levels of difficulty
made him feel as if he were playing an actual guitar due to the complexity of the on-
screen notation.

During second interview, the researcher asked the participant whether he thought
there were any similarities between the game's on-screen notation and guitar TAB.
Terry stated: "Well when you're reading guitar TAB you can see the guitar strings and
you can see when you place each note and they have that on the screen (in the game),
they have the shape of the guitar on the screen" (Terry, Interview 2). Terry was
comparing the visual interface of the game to the layout of guitar TAB in the sense
that it is a pictorial representation of the instrument. Terry further mentioned a
difference in the way that the on-screen notation was read from top to bottom to guitar TAB which is read from left to right.

The researcher then wanted to discuss more about what Terry enjoyed about playing
the game. He first said that he liked how game involves a lot of music that he finds
appealing. Terry added that he enjoyed the songs in the game so much that he would
often download them onto his iPod and listen to them in his spare time. He then
stated: "I think the good thing is that if you're really crap at guitar you can be
awesome at Guitar Hero. I think it's just an easier way to play guitar" (Terry,
Interview 2). Later in the interview, he added that found on-screen notation easy to
read even though he did not have a lot of experience with reading Western notation.
Terry also mentioned that he liked how he was able to challenge himself when he
played the game. He explained that he would often play a song on an easier level of
difficulty and then try to play the same song on a harder level of difficulty to try to
surpass his previous score. Additionally, he was challenged by his older brother who,
according to Terry, was extremely good at the game.
Terry explained in the first interview that he would often play the game with his siblings. Therefore the researcher asked some additional questions in order to understand the experience. He said that he would often get help from his brother when he would be unable to complete a song. However, things were not always amicable between Terry and his siblings when playing the game. Terry explained that they would frequently fight over whose turn was next, or whether the person playing was able to try another song. He then added: "I think it's more challenging with my family. Because I think [I'm] more comfortable with my family so I feel like I can be myself more and myself more is challenging" (Terry, Interview 2). It seemed that Terry enjoyed playing the game with his family rather than his friends, as he was not self-conscious about making mistakes.

The researcher finally asked Terry to play a song he was unfamiliar with. During that time, Terry's older brother came in the room and helped him pick out a song to play. Terry picked the song *Metal Heavy Lady*, and played it on a hard level of difficulty. This was different from the first interview as Terry played a familiar song on a medium level of difficulty. This could have had something to do with either being more comfortable with the researcher or the fact that his brother was in the room. When Terry played through the song, he was able to get through all of the song with accuracy. This time when playing through the song, rather than focusing on "the beat and rhythm", Terry reported that he was more listening to the guitar part and other melodic elements. Terry found it very surprising that he was able to complete the song, and stated that he enjoyed the anticipation of not knowing what was going to happen in the song.

The interview concluded and the researcher waited to start the interview with Terry's sister Eva. Terry seemed to have a very big love for music, but was at a stage in his music education that he was not able to really link many of the things he had learned in the game to other ideas or concepts. This could be due to his limited training, or whether he never had been asked to think about the game in those terms. The way he thought about the game could also be influenced by his older brother, which he seemed to have respect for.
Eva

First Interview

The interview began with asking Eva some background questions about her school life and music experiences. In her spare time Eva enjoys making jewellery, and hopes to one day open her own jewellery business. Additionally, she takes dance lessons at a dance academy, and enjoys swimming casually. Eva started playing the cello when she was younger, but later quit as she lost interest. A few years ago she took up playing the saxophone, but also ceased taking lessons, as she did not have time to practice when she started high school. Eva still engages with music at home through singing in her spare time. She also mentioned looking forward to participate in the school choir later in the year.

Besides playing Guitar Hero at home with her brothers, she also frequently played Rock Band at one of her friend's houses. Eva explained that her friend owned all the instrument controllers, so it made it possible for many of her friends to play at the same time. When at her friend's house she described using the microphone controller, but really enjoyed using the drum controller. When Eva's friends would come over to her house they would only think of playing the game if they were bored. This may have to do with the fact that Eva's family owned only one instrument controller.

Eva was then asked to play a song for the researcher. She was a little reluctant at first as she was worried that she would be judged on how well she played. The researcher quickly reassured her, telling her that the project was about how she experiences playing the game, not her skills at playing the game. Eva played two songs for the researcher, titled When You Were Young by The Killers, and Rock Me Like a Hurricane, by Scorpion. She played both songs on a medium level of difficulty. After playing the first song, she mentioned that she always forgot to use the Star Power feature in the game, as she was very focused on playing the notes. With both songs, Eva was able to play the majority of the on-screen notation with ease.

After Eva finished playing, the researcher asked her some questions about how she played the game using the instrument controller. One observation the researcher made was that Eva kept switching between using an upward stroke with her index finger on the strum control to using her thumb on a downward stroke. She explained: "My
fingers get like tired and I feel like when it is a long thing of notes, my fingers kind of
stop working and when I change they like start working again" (Eva, Interview 1).
Eva was explaining that her hands would often cramp up when she played, so she had
to use an alternate technique to compensate. On the fingerboard, Eva would use all
four fingers, with a finger on the first four coloured buttons. Eva added, that she
enjoyed using the whammy bar on the controller as "the sound is cool and it's just fun
to use" (Eva, Interview 1).

The interview moved on to asking questions specifically related to how Eva
experienced the game. First, the researcher asked Eva what the coloured notes on the
screen and guitar controller represented. Eva responded with: "This is really weird but
I think of it as ABCD" (Eva, Interview 1). The participant was comparing the on-
screen notation to actual pitches. Furthermore, she was able to link some ideas of
duration in the game, specifically making mention of the bars in the game stating that
they represent the tempo of the chosen song. In the second interview, Eva linked the
ideas of structure to the game when asked questions about familiar songs stating:
"you've got a sense of kind of when the chorus will come, and how you're gonna play
it and what it sounds like and it's just easier 'cause you know" (Eva, Interview 2).
Eva went on to discuss what she found difficult and easy about the game. Mainly she
found that faster songs with very close on-screen notation was the most difficult part
of the game, as she had problems following it. The easiest part of the game for Eva,
was the layout of the visual interface to the guitar controller as long as the song was
slow enough for her to follow.

The researcher wanted to know more about Eva's music class in order to lead into
asking about using Guitar Hero in her music class. She explained that she learned a
lot about the concepts of duration, pitch, tone colour and was able to provide some
examples of each. However she found some aspects of her class "boring" as the
teacher would repetitiously teach the concepts of music that Eva had already learned
in her private instrumental lessons. When asking about why she thought she learned
music in school, she could was unable to clearly answer the question. After a number
of probing questions, Eva stated: "it's really weird to say but a feeling of music and
like knowing what music is." (Eva, Interview 1)
Eva was very intrigued when the researcher asked her about using the game in her music class. She stated: "the teachers would see how each student could like interpret the [concepts] of music in the game. [The teacher] could see who is best, and who picks it up the quickest" (Interview 1). Eva may have been suggesting that the game could be used as a source of competition in the classroom, or a method for the teacher to assess the students' musical abilities.

Finally, the researcher and the participant discussed the commonalities between playing the games to authentic instruments. Eva first suggested that the game could be used to teach about playing instruments in a group:

I reckon you can work towards ending [a song] at the same time and you could apply that to real [life]. 'Cause you would have like the same feeling like when it's going to end all together and you just know how. I reckon it is kind of the same as real life. (Eva, Interview 1)

Eva then compared the guitar controller to an authentic guitar. She stated: "it's kind of the same, it's the same shape obviously, it's the same because you've got your strumming [control]... And there's different notes so it's just the same" (Eva, Interview 1). Eva then mentioned some differences explaining that the game could not prepare a person for playing an authentic instrument due to the different sounds created by an authentic instrument and the number of different notes.

Second Interview

After thematically coding the first interview, the researcher wanted to know more about Eva's experiences with playing the game socially with her family and friends. The researcher also wanted to discuss how the game related to some of the Learning Experiences in the New South Wales Board of Studies Year 7-10 Music syllabus (2003) as well as how Eva's prior musical experiences impacted how she played or viewed the game. The interview took place in the same living room with the participant's mother outside the door listening while preparing dinner.

Eva begun with discussing how her previous musical training helped her to play the game. She explained that learning to play an authentic instrument gave her a sense of musicality, in that she had a better ability to listen to the music and "get a sense of
where the next note would be." (Eva, Interview 2) She went on to discuss how she would be able to recognise elements of structure in a song through listening, which prepared her for repetitions in the on-screen notation.

The researcher then began discussing with Eva what it was like to play Guitar Hero with her brothers. She discussed how there were set rules in place so that each person would get a turn at playing the game. Often she would sit and watch her older brother play the game because "he's really good and it's really fast" (Eva, Interview 2). If she or her older brother were not playing, she would go on her computer or get a snack in the kitchen. According to Eva, it was when she went out of the room that her brothers would often skip her turn without notifying her. She added that she most often got into fights with her brother Terry, because he would usually retry a song that he failed. The fact that the family had only one controller made things difficult, however this was not the same when Eva went to her friend's house.

When Eva went over to one of her friend's house, she would often play Rock Band. She explained that it was most likely because her friend had just recently received the game. Eva enjoyed playing on the drums more than the guitar as the drums included sticks, which added to the physical nature of the controller and gave her the chance to pretend to be a "really good drummer" (Eva, Interview 2). Eva often eluded in the second interview to a pretend element of the game. She explained that when she played Rock Band with her friends they would pretend to be rock performers on stage by giving each person a rock persona and giving their group a band name. She then added that playing with her friends and the sound of the in-game crowd made her feel as if she was a rock performer on stage. Eva has had some experience with performing in public, but she preferred pretending to perform in the game it simulated an audience. This would provide Eva with a safe area and free of judgement while still feeling like she is performing. Additionally, Eva talked about how the game made her feel famous. When asked why it is good to be famous, she stated that everyone would know who she is and that they know her for playing that instrument in the band.

When choosing songs, Eva will generally pick songs she already knew and was familiar, as well as choosing some songs after listening to a preview of a song in the song selection menu. She would also generally pick songs that. Additionally, she
mentioned that she would frequently download the songs that she heard in the game onto her iPod to listen in her spare time. Eva discussed how the style of a certain song would make her feel like she was playing in front of an audience:

Well we play *Rock Me Like a Hurricane* 'cause it's loud...It's a big song, so like when you play it, it's kind of like a concert. And also 'cause I play the songs that I know I like I know them better so I can pretend that I'm like playing in a concert.

(Eva, Interview 2)

Eva was explaining that playing songs she is familiar with added to the pretend element of the game.

The researcher then asked the participant to play a song that she was unfamiliar with. She chose the song *Miss Murder* by AFI and played on a medium level of difficulty. She was able to play through the entire song with a 90% accuracy rating (according to the game statistics). Eva reported after finishing the song that she found some of the song easy with other parts more difficult. The researcher asked the participant what she was focusing on when playing the song, and she stated: "I wasn't really focusing on anything else, I was just listening, not really listening just kind of trying to play the notes as they came" (Eva, Interview 2). This differed from when she played songs she was familiar with as her attention was mainly placed on listening to the music and watching the on-screen notation instead of pretending to be a rock musician.

Eva had a lot of positive things to say about *Guitar Hero* and *Rock Band*. She was very positive about the overall screen layout of the game and the game controllers. Eva had some insight into the use of the practice feature in the game, stating that she does not use it personally, however she understands the benefit this feature could provide to other players. Generally, Eva would choose songs with a medium difficulty level as she couldn't play the faster notes, and would not try to learn them. Eva has a love for music and this is evident when speaking to her about music and the games. Her answers were very different than her fraternal twin brother, most likely due to her musical upbringing and possibly the school she attends.
Chelsea

First Interview

The interview began with discussing the participant's background with music. Chelsea has played the piano for about seven years and has completed her second grade Australian Music Examination Board (AMEB) piano exam and second grade AMEB theory exam. During the course of the interview the participant stated that she was currently working towards her third and fourth grade piano exam. She added that she found taking exams were beneficial for her progress on piano. Chelsea has had a number of performance opportunities playing piano through her teacher's piano studio and some dance performances.

The interview moved on to discussing Chelsea's experiences with playing Rock Band in her home with her family. When they first got the game Chelsea described a lot of fighting that ensued with her brothers over the songs they chose to play or the instrument controllers they were going to use. Each sibling had their own choice of instrument controllers that they liked to play. Chelsea liked using all of the instrument controllers, where her older brother would only play the guitar controller, and her youngest brother would sing and use the guitar controller. Chelsea's brothers would sometimes help with her playing technique and at times would help her through the difficult sections in songs she chose.

Chelsea discussed the types of songs that she enjoyed playing in the game. She would frequently choose songs that she knew or songs that she could sing along with while she played on the guitar controller. However, the researcher noticed when observing the participant play the game that she had completed most of the songs (this was indicated by a score next to each song title on the song menu). The researcher later asked Chelsea about this in the second interview and she explained that she enjoyed gaining the achievements that went along with completing all the songs. She later added that by completing all of the songs, she was able to unlock certain sections of the game and certain avatars that she could use within the game. Often, Chelsea would download many of the songs she enjoyed and listened to them on her iPod.
The researcher wanted to discuss with the participant whether she had used the practice feature in the game. This is a feature that none of the other four participants had described using when they played the game. Due to the difficult nature of some of the songs in the game, Chelsea would use the practice feature in order to learn the skills and technique to complete each song. The researcher asked the participant why she found it helpful to use this feature and she stated that she liked how it broke down the songs in sections, and allowed her to control the tempo in which she played the song. This feature was helpful for Chelsea as she would often play the songs on a hard or expert level of difficulty.

Chelsea was then asked by the researcher to play a song on either Rock Band or Guitar Hero. She decided to play the song *When We Were Young* by the Killers on a hard level of difficulty using the guitar controller, as the drum controller was too difficult to setup at the time. While playing the game, Chelsea positioned her left hand in the middle of all five buttons in order to comfortably reach each button. Chelsea later explained that this would allow her to stretch her fingers in order to reach the left and right-most buttons rather than moving her entire hand up and down the fingerboard. The researcher observed Chelsea moving her body as if dancing, and could hear her signing throughout most of the song. Furthermore, she continually used the whammy bar during specific parts of the song. When using the Star Power feature, it appeared that Chelsea knew exactly where to use it in the song in order to achieve the highest possible score.

The interview moved on to discuss Chelsea's playing techniques views on Guitar Hero and Rock Band. She first discussed why she liked using the Star Power feature. She explained: "some points in the game the little stars come up to show how you can get star power. 'Cause they (the game developers) usually put it at tricky parts. So it's like 'oh I actually completed that part, I actually got it!'" (Chelsea, Interview 1) The participant was referring to a type of challenge that is offered in the game by completing the on-screen notation that was in the shape of stars. She enjoys this part of the game because is able to complete certain benchmarks set forth by the game developers.

Through observing the participant play the game, the researcher noticed that she sang the lyrics of the song while playing the game. She stated that she would frequently do
this when she was enjoying the song she was playing. Furthermore, this also helped to add to her concentration while playing the game as she was completely involved in the song.

The interview moved on to ask the participant about the visual interface of the game and the on-screen notation. She was able to explain in detail how the game's notation was directly related to the guitar controller's coloured buttons. Additionally, Chelsea described memorizing the button patterns of certain songs in the game, and unsuccessfully attempting to replicate the notes on an acoustic guitar in order to see if the skills and knowledge she learned from the game were transferable to an authentic instrument. The researcher then asked Chelsea about the bars that scroll down the screen. Chelsea described them as a type of tempo marker.

Chelsea seemed to know a lot about music and the game, so the researcher asked questions relating directly to the concepts of music. The participant quickly responded with a description of some of the parts of music. She used the following words: beat, melody, rhythm, pitch, harmony, speed, volume, staccato, detached. When putting the words together in groups, the participant was giving examples of the following concepts of music: pitch, duration and dynamics & expressive techniques. The researcher wrote down all of these words that she described and then asked how each of them related directly to Guitar Hero and Rock Band. Chelsea was able to clearly describe that the different coloured buttons represented high or low pitches and liked the bars to the tempo of the music. Chelsea had a difficult time describing how rhythm or harmony was involved in the game. The researcher later asked the participant about these concepts in the second interview. However, Chelsea was able to clearly explain that any aspects of dynamics & expressive techniques were in no way involved in the game.

The researcher wanted to prepare Chelsea for the last question relating to bringing the game into the classroom. So, as with the other participants, the researcher asked the participant why she learns music. Chelsea responded with: "I think it's to show a different way of like knowing how to play actual music" (Interview 1). She later added that music class is about understanding music through playing instruments.
The researcher then moved on to asking Chelsea about her reactions if a teacher were to bring the game into a classroom. She said that she would be "really, really happy" because she enjoys the game and she would be able to help out other people in her class play the game. Chelsea believed that the teacher could use the game to teach students how to play an instrument. She went on to explain further: "So with the drums it's colour coded, [so] you could also probably print out sheets of paper saying like 'that drum kit's green and the cymbals are whatever colour', and just play it. So you can actually learn from it" (Chelsea, Interview 1). This could be a different method to teach students using a form of graphic notation.

The interview concluded with discussing with Chelsea about the composing program and whether she could compose a piece of music using Guitar Hero: World Tour. Unfortunately the game was for X-box and Chelsea did not have access to a X-box in between the first and second interview.

**Second Interview**

The researcher took the interview transcripts and formulated a new set of interview questions specifically for the participant. The researcher wanted to know more about Chelsea's experiences with playing the game with her friends and family, her desire to play the drums (which was eluded to in the first interview), as well as how she views playing the game. Other questions emerged in addition to the prepared questions as the interview progressed.

Chelsea had mentioned in the first interview that Guitar Hero and Rock Band influenced the desire to learn to play the drums. In the second interview she explained that she thought that the drum line was an important part of any song and further added: "it just sounds really cool in the background" (Chelsea, Interview 2). Additionally, she stated that she enjoyed the way the drummer is represented in the game.

The interview moved on to discussing what it was like to play the game with her family and friends. Chelsea started with explaining that she generally enjoys playing the game with her brothers as they are all working towards the same goal of completing the song. This differed, however, when she played with her friends, as they were not very experienced at playing the game. Chelsea then explained again
how each of her brothers and her had specific instruments that they would play, as if they were a professional rock band. They also had a set number of songs that they would normally play together. Frequently, Chelsea and her brothers would fight over song or instrument choices.

Chelsea talked about playing the game with her little brother. She explained that when she would play the game by herself, her little brother would often try to steal the guitar from her, because "he gets a bit lonely and he wants to play with somebody" (Chelsea, Interview 2). This would then lead to Chelsea and her younger brother playing the game together. Chelsea did not always enjoy this, because her brother would often want to play more than one song. However, Chelsea enjoyed the fact that her brother would help her out with some technical aspects of the game.

The interview moved on to discussing Chelsea's choice of songs while she played the game and why she liked to sing with the game. Chelsea enjoyed playing songs with a vocal line that she finds appealing, which were generally songs by Bon Jovi. She would never use the microphone controller while she used the drum or guitar controller because she risked getting a lower score if she did not follow the vocal line exactly as shown on the screen. She enjoyed singing some of the songs as it helps her to "get in the zone" (Chelsea, Interview 2) when she sings and plays. Additionally, singing also made her feel like "a singer song writer" (Chelsea, Interview 2).

During the first interview the researcher asked Chelsea to compare how the concept of rhythm (as she referred to it) was in the Guitar Hero and Rock Band games. Chelsea had a difficult time answering the question in the first interview, so the researcher asked the question again but with some follow-up questions. He first discussed with Chelsea how her piano music represents duration (or rhythm). She described the use of time signatures and the rhythmic names like crotchets and minims. The researcher then asked whether the game was able to show those elements in the on-screen notation. Chelsea described how the game would show either a note with a line to indicate a longer note or with shorter notes the game "might bunch them closely together" (Chelsea, Interview 2).

Chelsea had discussed throughout all of the interviews the notion of imagination with the game. She had often talked about imagining she was on stage. The researcher
wanted to know more about this in relation to wanting to play the drums and singing. She explained:

You feel like a little kid or something and dream of being a rock star and pretend that you're actually on stage performing. And if you've actually memorised a few notes of a song you can go in practice mode and you can say to your parents, 'oh look at me I can play it without looking'. And when you play with others you can like turn into an actual band and play it together. (Chelsea, Interview 2)

Chelsea was very interested in playing in a band because of the mutual interest in music and the concept of trust amongst the band members. The researcher was then interested in whether Chelsea thought that pretending to perform in the game was similar to performing in real life. The participant thought that it was not the same, however she then explained that if she were to play the game in front of an audience, it would be like a type of performing.

The interview concluded with asking the participant to play an unfamiliar song. Earlier in the interview Chelsea discussed being familiar with a song was more enjoyable for her because she was able to sing while she played. The researcher wanted to see if she had the same level of enjoyment playing an unfamiliar song. As Chelsea had played through every song on the game's list, she had to choose from a list of bonus songs. She chose the song Closer by Lucinda Coil and played it on a hard level of difficulty. She was able to play through the entire song with only some minor mistakes and received a high game rating of five stars. Chelsea described enjoying playing the song, but did not find it as different to playing any other song. She said this was due to the fact that she was able to get used to the different sections in the song, as the on-screen notation was very repetitive and the fact that some of the rhythmic patterns in the on-screen notation were similar to other songs that she had played. Finally, Chelsea reported mainly watching the on-screen notation rather than listening intently to the song.

Chelsea is a very intelligent and articulate young adult. She has a very unique way of playing the Guitar Hero/Rock Band games, and a distinctive way of viewing the game through the lens of music. Out of all of the participants interviewed and observed in the study, Chelsea was the most skilled at playing the game. It could be possible that
Chelsea's knowledge of music has had a positive impact in the way she plays the game.