Digital Games and English as Foreign Language (EFL) Learning in Tertiary Education in Saudi Arabia

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ABSTRACT

The relationship between digital games and second language (L2) learning is generally a controversial issue. Many adults and teenagers in Saudi Arabia (as well as around the world) play these digital games in English although it is not their first language. This study investigated the relationship between playing digital games as a leisure time activity and English language learning achievement among EFL students at an English language centre (ELC) in a tertiary institute in Riyadh, Saudi Arabia. The impact of EFL students gaming patterns, types of digital games played, and the amount of online social interaction on their language learning achievement were investigated in relation to students’ language achievement level and progression at the ELC. Students’ language achievement level was measured by their academic records which comprises students’ final exams marks in all English courses as well as their repetition rate (failing to pass one or more course). The study also aimed to investigate the students’ perception about the impact of gaming on their English language learning. This study employed a sequential explanatory mixed methods design conducted in two phases. First, a purposefully designed questionnaire was completed by 379 participants to investigate students’ gaming activities and perceptions. Then, focus groups were conducted with participating students to capture a more detailed account of their perceptions about the relationship between gaming and language learning. Following this, students’ academic records were obtained to measure students’ language achievement (SLA) levels. The results of this study showed a statistically significant difference in SLA between students who play rich and moderate in language games such as adventure and role-playing games and students who play low in language games such as car racing and sport games. The results also showed a statistically significant difference in SLA specially in English speaking and listening between students who engage highly in social interactions while playing online games and those who had low social interactions. Students’ perceptions provided a stronger indication that supported the results of the correlational analysis tests by considering rich in language games as a valuable source of language learning and that online gaming provided opportunities for improving communication in English by enriching speaking and listening skills. The findings from both of these research strategies aimed to provide support for a new approach where educators can blend leisure time with formal instructional time and which may improve the language learning process, improve student achievement and increase motivation for learning English among EFL students.
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My wife, Thikra, and my daughter, Fahdah, for their support and encouragement.

My brothers, sisters, friends and the participants in this study for their kind assistance.
CERTIFICATION

I, Abdullah Saleh Alamr, declare that this thesis, submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in School of Education, Faculty of Social Sciences, University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. The document has not been submitted for qualifications at any other academic institution.

........................................

Abdullah Saleh Alamr

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<thead>
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<th>Full Form</th>
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<tbody>
<tr>
<td>CALL</td>
<td>Computer Assisted Language Learning</td>
</tr>
<tr>
<td>EFL</td>
<td>English as a Foreign Language</td>
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<tr>
<td>EE</td>
<td>Extramural English</td>
</tr>
<tr>
<td>EGP</td>
<td>English for General Purposes</td>
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<tr>
<td>ELC</td>
<td>English Language Centre</td>
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<tr>
<td>E-mail</td>
<td>Electronic Mail</td>
</tr>
<tr>
<td>ESL</td>
<td>English as a Second Language</td>
</tr>
<tr>
<td>ESP</td>
<td>English for Specific Purposes</td>
</tr>
<tr>
<td>FL</td>
<td>Foreign Language</td>
</tr>
<tr>
<td>ICT</td>
<td>Information and Communication Technology</td>
</tr>
<tr>
<td>iPod</td>
<td>Portable media player</td>
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<tr>
<td>SLA</td>
<td>Students Language Achievement</td>
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<tr>
<td>SLA</td>
<td>Second Language Acquisition</td>
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<tr>
<td>TESOL</td>
<td>Teaching English to Speakers of Other Languages</td>
</tr>
<tr>
<td>TESL</td>
<td>Teaching English as a Second Language</td>
</tr>
<tr>
<td>TEFL</td>
<td>Teaching English as a Foreign Language</td>
</tr>
<tr>
<td>ZPD</td>
<td>Zone of Proximal Development</td>
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<tr>
<td>IPA</td>
<td>The Institute of Public Administration</td>
</tr>
<tr>
<td>SCT</td>
<td>Sociocultural Theory</td>
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<tr>
<td>DG</td>
<td>Digital Games</td>
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<tr>
<td>PS</td>
<td>PlayStation</td>
</tr>
<tr>
<td>DGBLL</td>
<td>Digital games-based language learning</td>
</tr>
<tr>
<td>DGBL</td>
<td>digital games-based learning</td>
</tr>
<tr>
<td>MMORPG</td>
<td>Massively multiplayer online role-playing games</td>
</tr>
<tr>
<td>MMOG</td>
<td>Massively multiplayer online games</td>
</tr>
<tr>
<td>COTS</td>
<td>Commercial Off-the-shelf digital games</td>
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<tr>
<td>ELL</td>
<td>English Language Learning</td>
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<tr>
<td>ELLs</td>
<td>English Language Learners</td>
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<td>SLL</td>
<td>Second Language Learning</td>
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<tr>
<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>TLCTS</td>
<td>Tactical Language and Culture Training System</td>
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<tr>
<td>RPG</td>
<td>Role playing games</td>
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<tr>
<td>FPS</td>
<td>First person shooter games</td>
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<tr>
<td>L2</td>
<td>Second Language</td>
</tr>
<tr>
<td>KSA</td>
<td>The Kingdom of Saudi Arabia</td>
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<tr>
<td>MBS</td>
<td>Crown Prince Mohammad bin Salman</td>
</tr>
<tr>
<td>CEFR</td>
<td>The Common European Framework of Reference for Languages</td>
</tr>
<tr>
<td>SCS</td>
<td>The Statistical Consulting Services</td>
</tr>
<tr>
<td>PC</td>
<td>Personal Computer</td>
</tr>
<tr>
<td>CAQDA</td>
<td>Computer-aided qualitative/quantitative data analysis</td>
</tr>
<tr>
<td>H/M/L</td>
<td>Heavy/Moderate/Light gamers</td>
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<tr>
<td>RL</td>
<td>Rich in language games</td>
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<tr>
<td>RML</td>
<td>Rich and moderate in language games</td>
</tr>
<tr>
<td>HIS</td>
<td>Players who interacted highly by speaking</td>
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<tr>
<td>IHL</td>
<td>Players who interacted highly by listening</td>
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<tr>
<td>FG</td>
<td>Focus group</td>
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CHAPTER 1: INTRODUCTION

1.1 Background to the study

My experience as an English as a Foreign Language (EFL) instructor at a tertiary institution in Saudi Arabia (as well as an EFL student in the past) contributed to my interest in this study. In my previous role as an undergraduate student, digital games have played an important role in my fascination with English and have encouraged me to achieve high grades in my studies. During my three years of teaching as an EFL instructor I observed that most of my students who play digital games on a regular basis were more fluent in English than others who do not play. I also realised that these students (gamers) have more desire and passion to learn English in order to use this knowledge in out-of-class as well as in-class situations.

One of the most important issues in the field of English language learning is the methods that facilitate such learning. Various factors have contributed to ease with which students acquire English as a second/foreign language. These factors include the immersion of students in new technologies such as computers, mobile phones and digital games.

In recent decades, adolescents and adults around the world have been playing digital games vigorously. PlayStation, Xbox, PC and mobile games have been and still are a big part of many peoples’ lives. According to a study by the Entertainment Software Association (ESA, 2015) more than 150 million Americans play digital games. In Saudi Arabia, according to a 2011 survey conducted by the Jordan-based consulting firm Arab Advisors Group, 65% of Internet users play games online (The New York Times, 2012).

International research conducted on language teaching and learning reflects a positive relationship between exposure to digital games and language learning. Some researchers discussed the idea of applying digital games to language learning and teaching as a way to encourage students to become more highly motivated participants in class (Eskelinen, 2012; Amoia, Gardent & Perez-Beltrachini, 2011). Other researchers suggested that educational digital games should be designed with the aim of raising motivation and awareness of EFL/ESL students toward learning a second language (Berns, Gonzalez-Pardo, & Camacho, 2011). Chik (2014) studied the role of playing digital games in acquiring English and Japanese as second languages in China. In her qualitative research study, she found that learning through digital games changed second language learners gradually from incidental to intentional and autonomous learners (Chik, 2014).
In Saudi Arabia, recent studies have addressed the notion of E-learning and using technology in EFL/ESL classrooms, as well as students’ attitudes toward the introduction of E-learning and educational technology (Ahmad, 2013; Farooq & Javid, 2012; Ali, 2013). Some research discussed the idea of using mobile phones in language learning, and the effect of mobile (chatting) applications such as WhatsApp and others on improving writing, vocabulary and word choice for EFL students (Morris, 2011; Alsaleem, 2013). Other studies have investigated the perceptions of EFL teachers about using technology in the EFL classroom (Saqlain & Mahmood, 2013). In regard to digital games and language learning, AlShaiji (2015) has investigated the impact of these games on children’s English vocabulary learning. His research indicated that digital games have a role in promoting vocabulary retention. Finally, other studies have discussed the effectiveness of using educational digital games as an EFL learning tool in different cultures, and the role of gaming and edutainment in language education (Bataineh, 2014; Fallata, 2012). These studies show that the idea of introducing digital games in language is starting to be considered in a range of Saudi educational settings.

Studies which have addressed out-of-class digital gaming as an “Extramural English (EE) activity” (Sundqvist, 2009, p i) for EFL learners, examined students’ perceptions on the effect of playing digital on language learning, other studies tested the impact of playing these games on students’ language achievement (Cornillie, Thorne & Desmet, 2012; Ranalli, 2008; Chen & Yang, 2013; Sundqvist, 2009). Although a number of studies have been found in the literature that considered the relationship between digital gaming practices as an Extramural English (EE) activity and students language learning, similar studies in Saudi Arabia were extremely limited. This gap provided a strong personal motivation to investigate and study the relationship between digital gaming practices (such as students’ gaming patterns and the types of games played) as an Extramural English (EE) activity that occurs during students’ leisure play time and their English language learning, as well as the perceptions of EFL learners in Saudi Arabia toward this relationship.

Therefore, this study aimed to add to the current body of knowledge on the role of digital games in English language teaching and learning, by investigating the effect of playing commercial off-the-shelf (COTS) digital games and the perceptions of EFL learners in regard to digital games and language learning at a tertiary institute in Riyadh, Saudi Arabia. The positive impact of digital games on learning a second/foreign language has been demonstrated by a number
of research studies, and teachers have implemented the use of educational digital games in various ESL/EFL contexts around the world. However, this is not the case in Saudi Arabia. As explained in the literature review chapter, a limited number of studies have been located in the Saudi Arabian literature that have investigated the relationship between Saudi EFL learners’ practices when playing COTS games and their EFL learning. Therefore, the perceptions of EFL learners in Saudi Arabia about digital games as a tool to learn English and the effect of playing these games on language learning achievement will potentially be a contribution to practice.

1.2 Research problem

The research problem which was investigated was the relationship between playing digital games and language learning achievement, and the perceptions and understandings of the role and impact of these games on English language learning among English as Foreign Language (EFL) learners in a tertiary setting in Saudi Arabia.

Integrating digital games in language teaching and learning is one of the recent methods that educators have introduced to facilitate teaching a second language. Different features of digital games have presented them as effective tools to facilitate the process of introducing a new language to speakers of other languages (Godwin-Jones, 2005) such as being motivating, providing integration in the target language, and affording opportunities to practice the language. Therefore, investigating the effect of engaging in playing the different types of these games on EFL learners and exploring their perceptions will contribute an in depth understanding of the relationship between digital gaming as an EE activity during learners’ leisure play time and their EFL learning to the existing literature. The study specifically examined these issues among Saudi EFL learners, which is a new contribution to Saudi Arabian context shown in the last section of the literature review (section 3.5).

1.3 Aim of the study

The aim of this research study was to explore the relationship between playing digital games and English language learning and achievement. Specifically, the study is investigating the extent of relationship between digital gaming practices among English as a Foreign Language (EFL) learners, and their achievement in an English Language Centre (ELC) at a tertiary institution in Riyadh, Saudi Arabia. The gaming practices of these EFL learners were measured according to
their frequency of play, type of digital games, and level of social online interaction. The learners’ EFL achievement level was determined by their success in the English courses in the ELC.

1.4 Research questions

The three central research questions and associated sub-questions that were addressed in this study were as follows:

1. To what extent does playing digital games relate to students’ language achievement (SLA) in English for tertiary students?
   Sub-questions:
   a) How do students’ patterns of playing digital games relate to students’ language achievement?
   b) How does the type of digital games played relate to students’ language achievement?
   c) How does engaging in online social interaction in English whilst playing digital games relate to students’ language achievement?

The second part of the study aimed to answer the second and third research questions:
2. What are the students’ perceptions of the potential of the digital games to enhance their EFL learning?
3. What are students’ perceptions of the effect of digital games on their EFL learning?

1.5 Paradigmatic perspective and methodological assumptions

Discussing the pragmatic stance of the author of any scholarly work is essential to allow the readers to identify the conceptual viewpoint of the researcher and understand from which perspective the data will be analysed. The researcher of this study adopts a dialectical stance which was initially suggested by Greene and Caracelli (1993) and Greene (2007) then further developed and employed by researchers in education (Hall & Greene, 2019; Cronenberg & Headley, 2019). The dialectic stance influences researchers to obtain a more detailed comprehension of their studied phenomena by considering perceptions from multiple viewpoints. According to Greene, it is essential when conducting mixed methods in social sciences “to invite multiple mental models into the same inquiry space for purposes of respectful conversation, dialogue, and learning from the other,”
which leads to “a collective generation of better understanding of the phenomena being studied” (2007, p. 13). The integration of various paradigmatic positions is discussed by Greene (2007) as the dialectic perspective in mixed methods research.

When conducting a mixed methods study, adopting a dialectic stance involves considering different reasoning processes and valuing distinct outcomes that question or build on current understanding about an investigated phenomenon. Therefore, a researcher who is taking a dialectical stance discusses a research problem from multiple paradigmatic perspectives, instead of selecting one (Cronenberg & Headley, 2019). The dialectical stance encourages investigating a phenomenon from multiple perspectives, employing a sequential explanatory mixed methods design believed to be the most appropriate to this study. The correlational analysis of the quantitative data expected to initially look for any noticeable patterns or relationships between the study variables. Then, the qualitative data in the form of focus groups is to investigate the studied phenomenon deeply from the perspectives of participants by engaging them into guided exchange of dialogues.

1.6 Overview of methodology and theoretical framework

To address the research questions, this study employed sequential explanatory mixed methods design (Creswell, 2013). The study took place in the English Language Centre (ELC) at a tertiary institution in Riyadh, Saudi Arabia. The ELC offers an intensive English as a foreign language program for postsecondary students to prepare them for their diploma majors. The study was conducted in two phases: phase one was a purposefully designed questionnaire of the overall targeted sample of students. A total of 379 questionnaires were initially completed. Phase two consisted of focus groups with participating students. Three focus group sessions were conducted with 6–8 EFL students in each session. Following this, students’ academic records were obtained to measure students’ language achievement (SLA) levels. Students’ academic records provided detailed information of students’ academic status. SLA consisted of each student’s overall final grades, sub-grades of each English course, and repetition records (if a student failed to pass any of the courses which resulted in repeating the course).

The sequential explanatory mixed methods design collected quantitative data from students’ questionnaires, then qualitative data was obtained afterwards in the form of focus groups to enrich and support findings from the quantitative stage. The quantitative stage employed
correlational analyses (T-test, ANOVA, and Chi Square) of the study variables, to determine any significant relationships. Next, students’ perceptions of the effect of digital games on language learning from questionnaires and focus groups were captured and analysed.

In regard to the study’s theoretical framework, two theories constituted the theoretical framework of this study. Vygotsky’s Sociocultural Theory (SCT) and Marsick and Watkins’s (1990; 2008) Informal and Incidental Learning Theory. In his sociocultural perspective, Vygotsky (1978) reveals that the advancement of human awareness is for the most part social, not cognitive (Nardi, 1998) and that social collaborations essentially add to the psychological improvement of an individual (Lightbown & Spada, 2006). This theory informed the study by pinpointing the importance of social interactions that occur when online gaming in facilitating EFL learning. On the other hand, Marsick and Watkins’s (1990) informal and incidental learning was defined by contrast with formal learning as it is “not typically classroom-based or highly structured, and control of learning rests primarily in the hands of the learner” and that it is seen “as a byproduct of some other activity” (p. 12). In this study, the informal and incidental learning theory was related to playing digital games in English and indirect learning of language skills when engaging in different types of digital games.

1.7 Significance of the study

The proposed study has both practical and theoretical significance. In relation to practice, the findings of this study were expected to show the level of understanding and acceptance by EFL learners of the assistance of digital games as a new technological method to learn English as a foreign language. In addition, the findings will set the stage for further research on the integration of digital games into EFL teaching. In particular, the outcomes of the study may provide the evidence for teachers and administrators at the English language centre in the Institute of Public Administration (IPA) – my institution and other EFL institutions – to consider new and different methods to facilitate English teaching. Theoretically, the proposed study will contribute a Saudi Arabian cultural perspective to the body of knowledge on digital gaming and EFL learning. It will also relate to the importance of social interactions in acquiring and learning another language, as part of the sociocultural theory, by providing evidence of a relationship between online interaction in digital games and EFL learning. The study will also shed light on how exposure to English via
digital games can lead to incidental language learning, which is an indirect, yet effective way of learning another language.

1.8 Brief definitions of the study’s major terms

**Digital games**: Digital games are games that involve the use of virtual technology to play, in contrast to using physical objects and activities (Connolly, Boyle, MacArthur, Hainey, & Boyle, 2012). ‘Digital games’ is a more generic term which includes both computer games (played on personal computers or laptops), video games (played on a specific games’ consoles such as PlayStation and Xbox), and mobile games (played on mobile phones).

**English as a foreign language (EFL)**: This term refers to the study of English in countries that don’t consider English as their first or second language. According to Broughton, Brumfit, Pincas and Wilde (2002), in countries where English is considered as a foreign language, “it is taught in schools, often widely, but it does not play an essential role in national or social life. In Spain, Brazil and Japan, for example, Spanish, Portuguese and Japanese are the normal medium of communication and instruction: the average citizen does not need English or any other foreign language to live his daily life or even for social or professional advancement” (p. 6).

**English as a second language (ESL)**: As opposed to EFL, English as a second language is where English is not the mother tongue of the country or people; however, “English is the language of commercial, administrative and educational institutions, as in Ghana or Singapore” (Broughton et al., 2002, p. 4).

**Extramural English activity**: The term extramural English indicates any activity that English learners engage in outside of the formal English teaching in the classroom. Extramural English (EE) was initially introduced in Sundqvist’s PhD dissertation (2009) as a comprehensive expression for terminologies used by other academics (Uuskoski, 2011) such as out-of-class learning (Bensons, 2001), out-of-school learning (Lamb, 2004; Yi, 2005), and spare time English (Lundahl, 2009).

**Computer assisted language learning (CALL)**: Computer-assisted language learning (CALL) is defined as “the search for and study of applications of the computer in language teaching and learning” (Levy, 1997: p. 1). CALL is one of the most common expressions in TESOL (teaching
English to speakers of other languages) which indicates the use of computer applications in EFL/ESL learning and teaching (Shaabi, 2010).

**Digital games-based language learning (DGBLL):** DGBLL originated from the term DGBL (Digital games-based learning), which is “putting games and learning together” (Prensky, 2005, p. 97) to create new learning opportunities, using games as a medium (Hung, Chang, & Yeh, 2016). As part of DGBL, Digital games-based language learning (DGBLL) is defined as “the design and use of a diverse array of digital games for the purpose of learning or teaching a second or foreign language” (Cornillie, Thorne & Desmet, 2012, p. 243).

**Massively multiplayer online role-playing games (MMORPG):** MMORPG originated from MMOG (massively multiplayer online games): “Online gaming is an application that evolved from applications called multiplayer games” where two or more players play the same game, and “players anticipated by playing on separate computers connected via a network” (Ries, Svoboda & Rupp, 2008, p. 181). MMORPG is defined as “a video game that takes place in a persistent state world (PSW) with thousands, or even millions, of players developing their characters in a role-playing environment” (What is a MMORPG? Definition from Techopedia).

**Commercial off-the-shelf digital games (COTS):** COTS refers to digital games that are designed entirely for entertainment purposes, without the intention of being integrated into learning or education. However, these games “are not absent of intellectual challenges or content” (Charsky & Mims, 2008, p. 38).

**Educational games:** Games that allow learners to practise gaming with meaningful educational outcomes. However, these games are not usually considered to be as engaging and motivating as mainstream or COTS digital games.

**Edutainment:** The term ‘edutainment’ is a combination of the two words ‘education’ and ‘entertainment.’ Zhang and Li (2012) define edutainment as “a hybrid genre that relies heavily on visual material, on narrative or game-like formats, and on more informal, less didactic styles of address” (p. 29). The purpose behind edutainment is to draw and hold the focus of students by drawing in their feelings through a PC screen rich with distinctively coloured animations (Zhang & Li, 2012).
**Gaming pattern:** The term gaming pattern in this study refers to how frequently students engage in playing digital games. Gaming pattern is divided into three main aspects: (1) how many hours students spend in playing digital games daily, (2) how many days students play digital games in a normal week, (3) and for how many years students have been playing digital games.

**Students language achievement (SLA):** Not to be confused with second language acquisition, SLA in this study refers to students’ language achievement. SLA is a measure of whether a student was a high or low language achiever. This measure was comprised of two main components: (1) a student’s cumulative final grade of all five English courses combined, (2) a student’s repetition record.

**Repetition record:** Used to signal if a student had failed to pass one or more English courses during his study. Scoring less than 65 out 100 in any English course resulted in failure of the course. Students who failed a course had to repeat the entire language level. Therefore, this was used to indicate low language achievement.

1.9 **Thesis structure**

**Chapter 1**
Chapter one commences with a brief introduction of the background to the study. Then, the research problem and research questions, in addition to the aim of the study, are presented. This chapter also includes a brief overview of the research methods and theoretical framework, as well as definitions of the key terms used in the study.

**Chapter 2**
Chapter two covers three interrelated dimensions of the literature related to the study. The literature review starts with an exploration of different digital games, then it investigates digital games in English language learning. Finally, the review is narrowed down to only include literature relating to the context of Saudi Arabia. The chapter concludes with an identification of the literature gap.

**Chapter 3**
Chapter three presents a comprehensive explanation of the study methodology and theoretical framework. The chapter starts with a description of the study’s theoretical and conceptual framework by discussing Vygotsky’s sociocultural theory (1978), and Marsick and Watkins’s
informal and incidental learning theory. Then, the context of the study and research design are described and justified. As the study employed a mixed methods design, a specific presentation of the quantitative and qualitative parts is offered. Each part provides a detailed explanation of the aims, questions, participants, methods of data collection and analysis. The chapter concludes with a description of the ethical considerations of the study.

Chapter 4
Chapter four mainly discusses the correlational analysis section of the study. The chapter begins with descriptive data analysis of the study variables, then proceeds to show the results of the correlational analysis tests between the dependent variable and the three independent variables. Finally, this chapter concludes with a comprehensive discussion of the correlational analysis results.

Chapter 5
Chapter five identifies and discusses students’ perceptions captured via two main methods. First, the chapter presents perceptions of the overall sample of students captured from the questionnaire, as well as the perceptions of students with rich in language game experiences. Second, findings of students’ perceptions captured via focus group interviews are presented. Finally, the chapter concludes with a comprehensive discussion that brings the findings of students’ perceptions from questionnaires and focus groups together.

Chapter 6
Chapter six presents the conclusion to the research study. The major findings of the study are brought together and summarised. In addition, the chapter underlines the importance of the theoretical framework to the study. The chapter also discusses recommendations for EFL teachers and learners with potential of benefitting from digital games in English learning and teaching. Finally, suggestions for future research studies are presented.

1.10 Chapter conclusion
This chapter introduced the research by presenting the background of the study and the experience of the researcher, which created the motivation for conducting this research. The previous personal experience of the researcher as an EFL learner with the affordances of digital games in EFL
learning, as well as the experiences of his students – while working as an EFL instructor – reinforced the motivation to investigate possible relationships between playing digital games and EFL learning in SA. After introducing the research topic, the research problem was explicitly discussed. Next, the aims and research questions of the study were presented followed by an overview of the research paradigm and the methods that were employed to address the aim of the study and answer the research questions. Vygotsky’s Sociocultural Theory (SCT) and Marsick and Watkins’s Informal and Incidental Learning Theory which constituted the theoretical framework of the research were introduced.

The chapter presented and discussed brief definitions of the major terms that were used frequently throughout the study and concluded with the overall structure of the thesis. Chapters 2-6 seek to advance the argument of this research. After introducing the main inquiry of the study in the first chapter, the second chapter aims to provide an extensive investigation of the literature related to digital games and EFL learning, specifically in the context of Saudi Arabia. The chapter aims to provide a clear identification of the literature gap for the study. Chapter three moves to explain the theoretical framework of the study and thoroughly describes the methodological techniques performed to conduct the research, collect and analyse the data. Next, chapters four and five aim to present, analyse, then discuss the data of the study. Both chapters follow the same structure as they are divided into two main sections; first is the data presentation and analysis and second is a comprehensive discussion of the findings. The thesis argument is wrapped up in the Conclusion chapter by presenting the study key findings and bringing both qualitative and quantitative findings together in order to answer the study’s research questions. The Conclusion chapter also provides suggestions for future research and recommendations for using digital games in EFL learning.
CHAPTER 2: LITERATURE REVIEW

Overview

The aim of this study was to investigate the relationship between playing digital games and English as a Foreign Language (EFL) learning of tertiary students in Saudi Arabia. This literature review chapter covers three interrelated dimensions of the study as depicted in Diagram 2.1 below. The first two dimensions include digital games and their impact on EFL learning. The third dimension provides the cultural context for the study, including the utilisation of technology and digital games in EFL education in Saudi Arabia to fulfil the current demands for educational reform (Fakieh Alrabai, 2016; Al-Zahrani & Rajab, 2017).

Diagram 2.1 Research areas of the literature review.

The first section of the literature review starts with a brief account of the area of digital games in their existing or potential connection to learning. This section defines digital games and identifies their various genres that can be used for learning, including EFL learning. To define “digital games” and to justify the selection of this term for this study, the definitions of video, computer, mobile and digital games are compared and contrasted. Then various types of digital games are examined. While this study focuses on digital gaming practices that involve commercial off-the-shelf (COTS) digital games, the literature predominantly associates
educational benefits with educational digital games. Therefore, COTS digital games are discussed in comparison with educational digital games to explain their differences and similarities to highlight the potential of COTS digital games for EFL education. Next, the genres of digital games (e.g. adventure games, sport games etc.) and the online features of digital games are reviewed.

The second section of the literature review deals with the studies that investigate the use of digital games for English as a foreign/second language learning (EFL/ESL). It explores the factors that are significant for such learning including frequency of play, type of games in relation to EFL learning, and the impact of online social interaction. A variety of contexts such as classroom learning, extracurricular activity, or entertainment are also considered. The impact of digital games on EFL learning is discussed in relation to all the fundamental skills of EFL/ESL learning such as reading, writing, speaking, listening and vocabulary. Next, a review of studies that examined the effect of different types of digital games and various patterns of game playing on EFL/ESL is conducted. Particular attention is given to the studies that examined the benefits of social, online interaction in digital games for EFL/ESL learning, which related to the major theoretical assumptions of this study.

The last part of the literature review discusses the context for this study: English language education in the Kingdom of Saudi Arabia (KSA). It starts with exploring gaming preferences and habits of gamers in Saudi Arabia. Then, a brief presentation of English education and the common teaching methods and pedagogies in Saudi Arabia is reviewed to observe the need for change and improve current teaching methodologies. Next, this part introduces Vision 2030 of Saudi Arabia and its developmental schemes in the education sector to situate this study in line with the demands of the vision. After that, a detailed investigation of studies considering the need for educational reform and change in English teaching in line with Vision 2030 is provided. Lastly, to position the current study in the context of Saudi Arabia literature, a general review of studies in Saudi literature examining the integration of technology in EFL learning is presented. Then, the literature review concludes with a comprehensive discussion of studies reflecting on digital games and EFL learning in Saudi Arabia that shows the importance of conducting this study.

2.1 Digital games

This section provides a general discussion of the area of digital games in relation to this study. It starts with a brief overview of the differences between video, computer, mobile and digital games,
and an explanation of why the term ‘digital games’ was selected. Then, the differences between commercial off-the-shelf (COTS) and educational digital games is discussed to determine possible educational aspects when using COTS digital games. Next, the different types (genres) of COTS digital games and the feature of online gaming are examined to demonstrate what qualities of the games can contribute to learning.

2.1.1 Video, computer, mobile and digital games

The literature distinguishes between the terms computer games, video games and mobile games. According to Mitchell and Savill-Smith (2004), “video games required dedicated games consoles solely for their use” such as PlayStation and Xbox, “whereas computer games could be played on a variety of desktop computer platforms” (p. 3). In regard to mobile games, this term includes any type of games played using mobile/cell phone or tablet technologies (Hsiao & Chen, 2016; Zhou, 2013).

This study does not differentiate between devices that provide the games but focuses on the impact of such games on EFL learning. Therefore, a generic term “digital games” which includes computer, video and mobile games was selected for this study. Digital games are defined as games that involve the use of virtual and digital technology to play, in contrast to using physical objects and activities (Connolly, Boyle, MacArthur, Hainey, & Boyle, 2012). In addition, digital games are generally characterised as “user-centred; they can promote challenges, co-operation, engagement, and the development of problem-solving strategies” (Gros, 2007, p. 23; So & Seo, 2018; Reinders & Wattana, 2015). Therefore, to meet the objectives of this study and make sure not to exclude any relevant games or gaming platforms, the term ‘digital games’ was used as it was considered as the most appropriate for this study.

2.1.2 Educational and COTS games

This study is investigating the relationship between gaming practices outside of educational institutions and EFL learning. While the study of digital games in education mostly refers to educational games, the literature also describes the cases of incidental EFL learning during the playing of COTS games. In this section educational and COTS digital games are compared and contrasted to discuss the potential of COTS digital games for EFL learning as relevant to the aim of this study.
COTS games are defined as “games that can be bought from a computer or game shop and designed purely for fun and entertainment rather than for learning” (Whitton, 2010, p. 199). Therefore, discussing educational and COTS games is presented here to show some different and mutual characteristics that can allow us to consider COTS games in the educational context.

Educational games are purposefully designed programs which allow learners to engage in gaming with specific educational outcomes. Studies suggest that educational games can provide a beneficial link between the entertainment provided by video games and potential learning. These studies argue that educational games have some common features with COTS digital games such as interactivity and increased motivation (Dondlinger, 2007; Denis & Jouvelot, 2005; Lee, Luchini, Michael, Norris, & Soloway, 2004). However, educational digital games vary significantly in their ability to deliver both entertaining and educational aspects for students. Researchers discussed several limitations related to educational games. These limitations revolve around the idea that educational games are not as engaging and motivating as COTS digital games (Conati, 2002). Some researchers point out that students are not familiar with educational games as much as they are familiar with COTS digital games, and they will need further assistance from their teachers to play them (Linehan, Kirman, Lawson & Chan, 2011). As Ibrahim et al. (2012) pointed out in relation to educational games, “a poorly designed game or a bad choice of game elements (story, challenges, puzzles, etc.) means that the player spends more time ascertaining how to play than in achieving the objectives of the content provided” (p. 197). Finally, educational games are designed to be played in school or classrooms, which prevents natural learning that might occur at home and outside of the schools’ time (Williamson, Squire, Halverson, & Gee, 2005).

Unlike educational games, COTS digital games are popular and frequently played in natural settings at home and during students/gamers’ leisure time. Additionally, these digital games “involve very little technological know-how or preparation on the part of the teacher” (Hoy, 2011, p. 29).

A number of studies attempted to integrate COTS digital games as part of the curriculum and incorporate them to replace educational games in the classroom. For example, literature on digital game-based language learning (DGBLL) considered the various second language learning prospects that can be offered by different types of COTS digital games. According to Cornillie, Thorne and Desmet (2012), “COTS games may function more as environments that may
incidentally support language-specific learning, but typically COTS games are not explicitly tutorial in nature” (p. 247). Some researches explored the use of massive multiplayer online role-playing games (MMORPGs) (Cornillie, Thorne & Desmet, 2012; Reinders, 2012), and others explored adventure and simulation digital games (Lu, Lou, Papa, & Chung, 2011; Sylvén & Sundqvist, 2012; Rankin, Gold, & Gooch, 2006), in addition to investigating COTS games with social online interaction features (Sourmelis, Ioannou, & Zaphiris, 2017; Wu, Richards, & Saw, 2014). All of these researchers, identified increased motivation, collaboration and enhancing decision-making and problem-solving among learners as the most important aspects in encouraging them to engage in learning while playing COTS games in the classroom. Although COTS digital games have the potential to deliver these benefits to classroom learning, it was argued that learning objectives might take an extremely long period of time to be achieved due to the complex nature of tasks in most types of COTS digital games (Van Eck, 2009).

Little attention has been given to the effect of learners’ practices when playing digital games (out of school) as part of their leisure time. Incidental learning that occurs as part of students/gamers’ habits and practices when playing COTS digital games naturally and away from the educational environment is considered to be an underexplored idea. Reinhardt and Sykes (2012) differentiated between ‘game-based’ and ‘game-enhanced’ learning. The difference is that ‘game-based’ learning is when learners play digital games mainly to learn as in using them for educational purposes; ‘game-enhanced’ learning, on the other hand, is when students learn incidentally while playing digital games in natural settings, such as in playing COTS games during their leisure time. According to Reinhardt and Sykes (2012), the field of ‘game-enhanced’ second language learning is believed to have less attention from researchers and there is a demand for more studies on second language learning through digital games that takes place “incidentally in the wild” (p. 38). A limited number of studies discussed digital gaming outside of the classroom or as an extramural activity and its relationship to (language) learning. Most of these studies (Olsson & Sylvén, 2015; Sundqvist & Wikström, 2015) observed the amount of time spent on playing digital games (hours of play) and its effect on English learners’ proficiency which is reviewed in part 2.4 in the literature review.
2.1.3 Digital games genres and online gaming

Literature identifies a range of different types (genres) of COTS digital games that can provide various opportunities for incidental learning. The below review of types of digital games aims to explain their differences and provide a general understanding of each type. These types of games are discussed later in this chapter (section 2.3) in relation to language learning.

There is no one single approach to the classification of digital games due to the complex nature of the field. As So and Seo (2018) recently indicated, “the classification of the game genre is perhaps the most difficult category to code because of the overlapping nature of these genres” (p. 402). Digital games were categorised based on different aspects in the games such as game platform (the hardware used to play the game); game genre (the purpose and content embedded in the game); or game mode (single or multi player game and online or offline game) (Apperley, 2006). The classification of digital games by researchers in game-based learning (which has been utilised in the digital gaming industry) is commonly based on the content of the games, such as: if the game is an adventure story, fast-based action game or a role-playing game etc. (Connolly, Boyle, MacArthur, Hainey & Boyle, 2012). The seminal classification by Prensky (2001) which is accepted by other researchers in the field of digital games-based learning (DGBL) (Aburahmah, AlRawi, Izz & Syed, 2016; Rogers & Johnson, 2016) classified digital games into eight main categories/genres: Action, Adventure, Fighting, Puzzle, Role-Playing Games (RPG), Simulation, Sport, and Strategy games. This classification is described in detail below

- Action games are mostly fast-based games including maze games, hunting and gun-battling games, as well as car racing games (such as: Super Mario and Doom).

- Adventure games are story-based games that involve solving mysteries and puzzles to find your way, and explore a mysterious world (such as Zelda, Resident Evil, and Metal Gear Solid).

- Fighting games are typically games where two (or more) characters are involved in a physical battle where the aim is to ‘knock the rival down’ (such as Mortal Kombat and Tekken).

- Puzzle games are the very simple ‘graphical problems to be solved.’ These games are also known as mind games, and they are not based on any storyline or actions (such as Tetris and Candy Crush).
• Role Playing Games are widely known as RPG. The player is required to play as a character which can be improved and developed physically and skilfully over time. RPG games are slow games where players are the decision makers of the game’s storyline (such as EverQuest and Final Fantasy).

• Simulation games can differ from entertaining games to serious applied games used in science, military or aviation industries. These games engage players by simulating a real-life experience such as building worlds or managing a business (such as The Sims and Sim City).

• Sport games are obviously any game based on playing any type of sport (such as FIFA, NBA, and NFL).

• Strategy games are where the player is responsible for managing the development of an entire empire, army, or even farm. These games can be played individually with no contact with others, or commonly against competitors or enemies (such as Travian and Clash of Clans).

The above classification of COTS digital games which is derived from the game taxonomy of Prensky (2001) was used in this study. It is a well-known and accepted classification of COTS digital games among most gamers, including the participants in this study, which reduced confusion during data collection.

Finally, online gaming emerged recently as a separate and standalone genre of digital games that provides learners with a real-time instant interaction with other gamers. The feature of online gaming in digital games is typically where a group of distanced gamers are involved simultaneously in playing a game while connected to the Internet. Online gaming or playing against (or with) opponents from all around the world used to be restricted to limited types of games. Recently, almost all COTS games across different genres have been equipped with the feature of online gaming (Thorne, 2008). However, not all of these games which have online gaming provide or involve verbal/written social interactions with the other gamers. For example, playing FIFA (sport game) or Tekken (fighting game) online does not require engagement in any verbal/written social interactions with the other gamers. Online gaming in such games (FIFA, Tekken, etc.) mainly allows gamers to compete against each other instead of playing against the computer. On the other hand, online social interaction (written or mostly oral) is essential for cooperation and teamwork collaboration in most of the other games such as adventure, RPG (and
MMORPG), simulation, as well as some first-person shooter games (FPS). The latter type of online interaction in digital games provides English language learning opportunities among gamers/peers (Peña & Hancock, 2006; Hoy, 2011; Smith, 2014).

2.2 Digital games in language learning

This section discusses digital games in English as a second/foreign language (ESL/EFL) learning. It starts with a brief overview of utilising digital games in learning and teaching ESL/EFL to indicate what qualities and features of these games can be beneficial in language learning. Then, the impact of digital games on different English skills is presented. Next, literature that relates directly to the three main factors of this study is discussed: 1) The relationship between ESL/EFL learning and different types, and 2) different patterns of playing digital games. After that, a discussion of the particular effect of 3) online social interaction while gaming on EFL/ESL learning is presented. Finally, this section concludes with discussing studies that investigated the effect of playing digital games as an extramural English activity (or as part of leisure play time) on EFL students’ English proficiency. Discussing digital games as an extramural English activity is essential to this study which examined EFL students’ practices in playing digital games during their leisure time and tested it against their EFL achievement level.

2.2.1 Digital games-based language learning (DGBLL)

This review of the field of Digital Games-Based Language Learning (DGBLL) presents the educational values in these digital games specifically in relation to language learning. Therefore, it is important to review how these games have been used, and what features can be employed to address language learning.

The relationship between digital games and language learning was observed by researchers a few decades ago (Cornillie, Thorne & Desmet, 2012). According to Malliet and de Meyer (2005) most of the old digital games ranging from rich in language games to more fast-paced action games, as well as new PC games, have extended the potential for gamers to interact in and with foreign languages. Digital games are distinguished from other language teaching tools by some features that were considered as their unique elements, in that they provide gamers with a variety of skills accompanied by entertainment. Researchers argued that skills such as problem solving, and individual and collaborative learning opportunities can be delivered in multiplayer online
games. In addition, a significant amount of reading and writing is required throughout most digital games, which provides a text-rich environment for language learning (Steinkuehler, 2004; Black, 2005; Coleman, 2002). Moreover, digital games provide learners with an engaging environment that attracts the attention of language learners and secures their participation in activities (Aldrich, 2003; Prensky, 2003). Therefore, digital games were seen as a potential learning tool that needs to be employed in order to target the current generation of language learners. In addition, digital games as part of mobile technologies received plenty of attention among researchers of informal language learning. Kukulska-Hulme and Viberg (2018) conducted a comprehensive literature review on the use of mobile technologies in collaborative language learning. The authors demonstrated the benefits of using mobile technologies in informal language learning, highlighting the importance of social interactions and collaboration as crucial elements in developing language learning.

The area of DGBLL which originated initially from the field of Computer Assisted Language Learning (CALL) concentrated on digital games as a learning medium more than other types of computer technologies (Cornillie, et al., 2012). Digital games in the DGBLL field are divided into two main categories: 1) CALL games designed specifically to support ESL learning, and 2) commercial-off-the-shelf (COTS) games that are not designed to support ESL learning. Most of the studies in DGBLL focus more on CALL games or educational games. However, researchers recently started to shift their attention to COTS games in DGBLL as well. For example, the Thorne and Fischer (2012) study on EFL learners in Russia and the United States concluded that 86% of their participants who play COTS games reported that, although these were not English-learning oriented games, their language improved as a result of interaction through online platforms. Similarly, Zheng, Newgarden and Young (2012) researched communication skills among EFL students from Turkey, China and Saudi Arabia through playing a COTS digital game called World of Warcraft. One of the main findings was that students indicated that they have developed their everyday communication skills in English through social interaction activities in these games. Another study by Chen and Huang (2010) obtained similar results that add to the potential of COTS digital games in language learning. According to their findings, the COTS games they used (Sid Meier’s Pirates and Sam & Max) “help to immerse language learners in the sociocultural contexts of the target language and encourage shy learners to actively engage in
communicative activities” (Chen & Huang, 2010, p. 135). All of these studies were investigating English language learning as most COTS games are designed in English.

A number of studies discussed the possibility of integrating COTS games into a larger context of educational activities to enhance the benefits of such games for language learning (Cole, 1996; Alsayegh, 2016; Alqahtani, 2016). These studies found that individual literacy skills can be enriched through integrating COTS games into different language learning activities. Such integration found to be beneficial in improving children reading and writing through playful communications (Cole, 1996), enhancing vocabulary acquisition (Alsayegh, 2016) as well as language pronunciation and the willing to interact in the target language among EFL college students (Alqahtani, 2016).

Finally, studies in DGBLL have considered the use of COTS games (as well as educational games) for English language learning, which is the general aim of this research. Researchers presented different features in these games that can add to students’ learning of the target language. Therefore, and for the purpose of this study, a more specific review of English skills that can be improved through digital games, and what different types of games can benefit EFL learning are presented next. Then, the effect of gaming patterns (gaming frequency) and social interaction in digital games on EFL are discussed. These four areas in digital games and language learning comprise the main discussion of this research study.

### 2.2.2 Digital games and various English skills

Several studies have discussed the potential impact of digital games on language learning in general, and specifically on the four fundamental English skills (reading, writing, speaking, and listening). These studies employed different approaches to obtain their findings and mainly focused on one or two of the English skills only. In addition, some studies explored digital games alongside different means to facilitate language learning. This study aimed to investigate the relationship between playing different digital games and the students’ language achievements in the four fundamental English skills. Therefore, it is significantly important to review related studies that have explored these relationships.

In regard to the possible impact of digital games on improving English writing skills among EFL learners, studies have found contrasting results. Olsson’s (2012) study found a positive correlation between Extramural English (EE) and Swedish EFL writing grades. In this study (EE)
included activities such as: watching TV and listening to music as well as playing digital games in English. Olsson (2012) claimed that “a combination of factors is probable, and that Extramural English is one factor that may indeed enhance writing proficiency” (pp. 131–132). Similarly, Chik (2014) stated that “Good games engage players not only in playing the game, but also in reading and writing about them on interest-driven websites” (p. 87). However, Olsson’s (2012) study involved different activities beside digital games, in contrast the Chen, Chen, Chen & Yang (2012) study captured the views of teachers specifically on using digital games on English language learning and different results were found. The participating teachers claimed that digital games were more effective for receptive skills (such as listening and reading) and vocabulary learning, rather than productive skills such as speaking and writing.

English listening and speaking skills and digital games are mostly discussed in relation to the social online interaction in these games. Online interaction through digital games allows EFL learners to connect with other gamers around the world and requires communication using English speaking and listening. Studies in online gaming and EFL learning stressed that, while improving gaming practice, social interaction through digital games enhances communication and motivation to interact using English. Sourmelis, Ioannou and Zaphiris (2017) argued that online interactions through digital games “promote communication, making language learning an authentic experience that involves interaction with native speaking co-gamers” (p. 44). In addition, Wu, Richards and Saw (2014) indicated that online interaction through digital games “values and promotes the power of multi-directional communications and, through communication, gaming experience is enriched and the opportunity for using English for communicative purposes thrives” (p. 81). In regard to the impact of online gaming on EFL students, Reinders and Wattana’s (2015) participants indicated positive effects of playing these games on interacting in the target language as well as on learner self-confidence and willingness to communicate. Improvement in listening and speaking skills were also noted in relation to playing digital games without the feature of social interaction and online gaming. EFL teachers in Chen et al’s (2012) study argued that digital game-based language learning can help EFL learners learn new vocabulary while listening to dialogues between games characters. In addition, they argued that these games can improve the listening skills of EFL learners, and that they may imitate the pronunciation of games’ characters which may improve their speaking skills as well.
Finally, EFL reading skills were also discussed in relation to playing digital games in English. Most of the rich in language digital games (which will be discussed next in 2.3) provide EFL learners with significant exposure to the target language through different means. The texts provided by games, subtitles of the characters’ conversations as well as reading about ‘how to succeed’ in these games on the web can improve different reading skills (Chen et al., 2012; Chik, 2014; Lu, Lou, Papa & Chung, 2011). Chen et al’s (2012) study claimed that reading as a receptive skill can be enhanced by reading subtitles of dialogues between games characters. In addition, Chik (2014) added that digital games can improve EFL learners’ reading skills through “the reading of in-game texts” (p. 86) as well as reading about digital games on interest-driven websites such as walkthroughs, tutorials, and gameplay instructions. Digital games, and specifically adventure games, were also considered as being beneficial in stimulating the learning motivation of English reading among EFL learners. These digital games were also deemed to increase the confidence of low-achieving learners in English reading as well as enhancing English reading self-efficacy (Lu, Lou, Papa, & Chung, 2011).

Therefore, according to the abovementioned studies, certain features and elements available in some types of digital games might have an essential positive effect on one or more of the four fundamental English skills. However, while most of the studies considered the potential effect of digital gaming on these skills by capturing the perceptions of EFL learners or teachers, it is noted that only a few studies have investigated these effects using experimental designs.

2.2.3 Language learning related to the genres of digital games

Digital games include a variety of genres and can be played on different devices such as consoles and computers. An overview of the genres of digital games has been provided earlier in this chapter (section 1.3). This section examines the impact of various genres of games on students’ language learning. The effect of different types of COTS games on EFL learning has been selected as one of the main variables for this study. Rapeepisarn, Rapeepisarn, Wong, Fung and Khine (2008) argue that “different game genres have different impact on the content of learning activities. Some contents are best learned through role-playing and adventure games, others are best through games that show competition, action and even sport games” (p. 500).

Digital games that fall under the categories of adventure, simulation and role-playing games (RPG) are considered to offer a significant contact with the target language of the game. A
number of studies claimed that these types of games provide gamers with the language and facilitate their practice. As Gee (2012) commented, these games provide rich, multimodal environments for meaningful language learning by associating written and oral texts with images, actions, goals and dialogues. The dialogues between games’ characters as well as the need to understand the games’ story to be able to play and proceed in the game are the two main features that provide language exposure (Bronstring, 2012; Cornillie, Clarebout & Desmet, 2012). These types of games often require gamers to obtain and interactively practise a considerable amount of the target language to be able to play and progress to advanced levels of the games (Whittaker, 2013; Chik, 2014).

Numerous studies discussed the possibility of using adventure games in EFL learning and teaching. Chen, et al’s (2012) study explored the potential of adventure games in relation to EFL learning by interviewing EFL teachers. The study claimed that adventure games usually have a strong intriguing storyline as well as highly authentic English language. In addition, the study claimed that adventure games offer “very rich language input” and that “language learning occurs with gaming” (p. 127). Adventure games were also described as “relatively language-intensive and contemplative games” (Cornillie, Thorne & Desmet, 2012, p. 244).

Role-playing games and simulation games are also considered as language-rich games. Rankin, Gold and Gooch (2006) argued that role-playing games can improve conversational skills among gamers/EFL learners. Sylvén and Sundqvist (2012), who explored digital gaming as extramural English learning, claimed that role-playing games and simulation games “provide fertile ground for L2 acquisition and great possibilities for target language input, output, and interaction” (p. 308). Consequently, adventure, role-playing and simulation games were considered in this study as ‘rich in language’ games where gamers are required to have sufficient language skills to successfully play and complete games’ tasks.

Other types of games such as fighting, first-person shooter (FPS) and design/art games also were shown to provide lesser, but still considerable exposure to target language for gamers. These games either require gamers to have only basic language proficiency, or that the language contribution of these games is restricted to a particular skill or field. Gerber and Price (2011) argued that the genre of first-person shooter was perceived as games that can allow students to analyse an issue from a critical perspective and convince others to consider their viewpoints. Therefore, the authors suggest that FPS games “might be used as a platform for persuasive writing”
(Gerber & Price, 2011, p. 71). Fighting or battling games were also considered as providing some English language experiences. However, Harper (2013) explained that fighting games are seen as “slang-filled” (p. 112) and do not provide adequate exposure to conventional, standard language. Therefore, fighting or battling games might only provide a fragmented language exposure restricted to a particular slang or dialect which represents the theme of the game. These games were considered in this study as ‘moderate in language’ games.

Lastly, car racing, sports, and puzzle games involve either minimum or no language skills. Chik’s (2014) study, which discussed digital gaming and language learning in general, explained that sport or car racing games can provide EFL learners with some L2 vocabulary and knowledge. However, this is limited to the context of the game’s type (either sport context or car racing context) (Chik, 2014). In addition, playing the game is not difficult even if learners are not familiar with the language of the game. These types of games are fast and reaction-oriented games that can stimulate skills such as “tactics, rules and the ability to think and make decisions quickly” (Whitton, 2009, p. 61) but not necessarily language skills. These games were considered as ‘low in language’ games in this study.

2.2.4 Gaming patterns and language learning

In the context of EFL and language learning a number of studies focused on the amount of time EFL learners spend playing digital games and whether it had any effect on their EFL learning. In other words, researchers examined if the frequency of playing digital games (such as hours of play per day, days of play per week, and years of play) among EFL learners has an effect on their EFL achievement. Exploring this relationship is essential to inform the variable of EFL students’ patterns of playing digital games which is investigated in this study.

Gamers were labelled as “expert” and “novice” or “experienced” and “inexperienced” according to their experience in playing digital games (Rau, Peng & Yang, 2006; Rogers & Johnson, 2016; Chik, 2011). However, the studies did not agree on the number of years which would define a gamer as an “expert” or “novice”. For example, in the study of Rau, Peng and Yang (2006) gamers were categorised as expert if they had played digital games for over 3 years, and novice gamers those who had played digital games for less than 3 years. The study of Rogers and Johnson (2016), on the other hand, considered gamers as experts if they had 6–10 or more years
of gaming experience, while Chik’s (2011) study relied on the participants self-reporting to consider themselves as experienced or inexperienced gamers.

Despite the particular number of years to consider gamers as expert or not, years of experience in digital games was considered as an indicative factor in relation to English language learning. The study of Rogers and Johnson (2016) investigated the perceptions of EFL students who were considered as expert gamers with more than 6 years of gaming experience of the effect of digital games on language learning. The participants reported that digital gaming and especially the long period of exposure to digital games could positively related to their language learning. Chik (2011) discussed the perceptions of practising English teachers about digital gaming and language learning in her research about digital gaming and social networking in Hong Kong. The teachers who considered themselves as experts in digital gaming associated gaming with improving English language and encouraging EFL learners to practise the language. Conversely the teachers who were novice gamers in part of Chik’s (2011) study considered learning to play games as not an actual learning process; and that winning the game is the only objective that they need to achieve. They also thought that reading about the game and reading the game’s instructions were a waste of time and not that beneficial.

Several studies have also categorised gamers as experienced or non-experienced based on frequency of their play during a week (duration of play per week). However, studies differed in how they approached their identification of gamers as experienced and non-experienced. Some studies considered weekly play hours, others considered weekly play days, and some studies left it to the gamers’ estimation to quantify their experiences by asking them to rate their play routine (ranging from never to always). Sylvén and Sundqvist’s (2012) study categorised gamers’ experience into three groups regarding the number of hours they play per week. Non-gamers were those who don’t play, moderate gamers were those who play less than 5 hours a week, and frequent gamers were those who play more than 5 hours a week. The study found that there was a significant correlation between frequency of playing digital games and EFL learning. Specifically, the authors found that there was a significant difference between frequent, moderate and non-gamers in regard to reading and listening comprehension scores on the Swedish national test (Sylvén & Sundqvist, 2012). Frequent gamers who play more than 5 hours a week scored significantly higher than the other two groups (moderate and non-gamers). Similarly, Rankin et al. (2006) in their intervention
study found that EFL learners significantly increased their English vocabulary after playing *EverQuest 2* (an online role-playing game) for at least 16 hours in a 4-weeks period.

Studies also categorised gamers according to number of hours they play in a day. Researchers in the field of addictive gaming or violence in digital games were the most interested in patterns of gaming (hours of play) (Männikkö, Billieux & Kääriäinen, 2015; Kuss, Louws, & Wiers, 2012). However, researchers in the field of digital games and language learning also considered hours of play per day as a factor that might impact EFL. Gamers were labelled as heavy or frequent if they spent extended hours in playing digital games; otherwise, gamers who spend less hours playing digital games were considered as low or moderate gamers. The studies of Jansz and Martens (2005), and Frasson, Liu and Dufresne (2018) divided gamers into three types in relation to frequency of play per day: “heavy”, “moderate” and “light” gamers. “Heavy gamers” were those who spent more than 2.5 hours a day in front of their screens playing digital games; “moderate gamers” were those who spend between 1 to 2.5 hours a day playing digital games. The third type of gamers was “light gamers” who spent less than one hour a day playing digital games.

Using the same categorisation as the Jansz and Martens (2005) study, Yılmaz, Yel and Griffiths (2018) investigated the effect of heavy digital gaming (more than 2.5 hours per day) on students’ social and educational status by interviewing teachers and peers of three heavy gaming students. The interviews showed that the teachers pointed out a positive side of heavy gaming in regard to English language learning. The teacher stated, “that playing video games appears to help students learn English words, and this contributes positively to their foreign language learning by increasing their motivation toward the English course” (p. 157).

To sum up, numerous studies have classified different patterns of playing digital games in regard to frequency of play (daily, weekly), or overall experience (length of play in years). The studies categorised gamers as heavy, moderate, low, or expert, experienced, novice and non-experienced. The effect of these different patterns of digital gaming habits have been also studied in regard to EFL learning and teaching. Most of the studies explored the perceptions of EFL learners and teachers about the effect of digital gaming on EFL learning. A limited number of studies that tested the relationship between patterns of playing digital games and EFL learning found a positive correlation between frequency of digital gaming and some specific aspects of EFL learning.
2.2.5 Online gaming and language exposure

Online gaming or multiplayer online games have been the centre of discussion in many studies recently either in the EFL field or in other fields (Hoy, 2011; Berns, Gonzalez-Pardo & Camacho, 2011; Rama, Black, Van Es, & Warschauer, 2012). The feature of online social interaction (written or oral) with other gamers around the world is the key element that differentiates online gaming from any other type of digital games. One of the main variables investigated in this study was the social interaction that occurs in online gaming. This is consistent with the sociocultural theoretical framework of this study. Therefore, the literature that investigated the relationship between online social interaction in online gaming and EFL learning is reviewed below.

Students of EFL who are also gamers often participate in extended sessions of online interaction when playing digital games, and such social interactions may establish firm learning techniques and habits (Hoy, 2011). It is evident that online interaction offers genuine opportunities for gamers/EFL students to learn from each other and receive a real-time feedback (Berns, Gonzalez-Pardo & Camacho, 2011). A major value of online digital games for EFL learning is in their immersive collaborative environment which provides plentiful opportunities for players to engage in authentic communication by listening, speaking, reading and writing in the target language with other speakers (Rama et al., 2012).

Since the vast majority of digital games are designed in English and games are played all over the world, online social interactions mostly occurred in English language. Several studies have researched the effect on, or discussed the potential of, online gaming for benefitting EFL in general, or specific English skills. Dixon and Christison (2018) in their explorative study investigated the usefulness of Massive Multiplayer Online Role-Playing Games (MMORPG) as a second language acquisition tool. The findings of their study showed that playing online digital games (such as MMORPG) promoted second language acquisition by providing opportunities for social interaction in L2 learning through collaborative problem-solving tasks. In addition, the demand for input and output to cooperate in playing and succeeding in the game requires gamers to interact in the target language. Chen and Huang (2010) argued that online gaming “offers an ideal communicative context for English language learners to stay motivated while immersed in gameplay and thereby potentially develop language proficiency through voluntary online interactions” (p. 70). Other researchers also justified the impact of social online interactions in digital games on EFL learning through the notion of scaffolding related to Vygotsky’s (1978)
sociocultural theory and his notion of the zone of proximal development. For example, Sylvén and Sundqvist (2012) argued in their study that online gaming offers circumstances “that are in Second Language Acquisition Theory considered important for L2 learning: first, comprehensible input and scaffolding through interaction and second, motivation” (p. 305).

The online interaction (verbally or in writing) is considered as an important facilitator to practise and potentially improve related English skills such as speaking, listening, writing, and reading. Some studies demonstrated that online social interaction via digital games has a positive impact on EFL students’ listening and speaking skills (Wu et al., 2014; Reinders & Wattana, 2015).

Wu, Richards and Saw (2014) introduced EFL students to a MMORPG called Everquest 2. Students participated in a one-hour in-class gameplay and completed a survey about language learning through digital games followed by interviews. When discussing the findings of their study, the researchers argued that playing online games values communication activities which enhanced the gaming experience and enriched language learning opportunities. In response to the part of the survey which was based on Yee’s (2006) 10 motivation subcomponents, participants in Wu et al., (2014) study rated the three components of coordination, socialisation and team-work as the most important when interacting while playing online. In addition, Reinders and Wattana (2015) discussed the effect of digital games on the willingness to communicate among six EFL learners in Thailand who participated in a 15-week digital-game-based program. After several interviews with each of the participants, the researchers found that online interaction in these games provides EFL learners with conversational skills and improves speaking and listening abilities by developing communicative competence, especially when interacting with English native speakers.

In addition to considering the effect of online gaming on learning these specific English skills, studies discussed that online interaction with other gamers can enrich EFL learners’ vocabulary (Bytheway, 2014; Shahriarpour & Kafi, 2014; Yudintseva, 2015; Zheng et al., 2015). Several experimental studies found that if online interaction through digital games is based on instruction as part of the curriculum, it can also develop EFL sentence composition (Yang & Hsu, 2013), communicative competency (Peterson, 2010; Wu & Richards, 2012; Berns et al., 2013), and reading abilities (Dourda et al., 2014). In addition, studies also found a correlational positive impact of online gaming on improving students’ achievement in the fundamental language skills of listening, reading, writing (Suh et al., 2010) and speaking skills (Lai and Wen, 2012).
In summary, the previous studies outlined the merits and learning potential that online gaming can offer to EFL/ESL learners through online social interaction. Most of these studies indicated that there might be a relationship of cause and effect through investigating EFL teachers and learners’ perceptions or by studying qualities of some online games. However, a limited number of studies provided correlational analysis of large volumes of data on the impact of online social interaction on EFL learners’ achievement. In addition, most of these studies explored online gaming as an in-class activity, but not as a part of students’ leisure play time which is the focus of this study.

2.2.6 Digital games as an extramural activity and EFL learning

Extramural activity in EFL studies refers to any activity that takes place outside of the EFL classroom and curricula, as an additional endeavour, which can benefit the general aim of learning English, such as: listening to music, watching movies or playing digital games in English (Hlebnikovs, 2017). While the term extramural activity or extramural is not commonly used in educational literature, it is relevant to the aims of this research study which is investigating the relationship between students’ EFL achievement and playing digital games during their leisure time.

The playing of digital games as an extramural English activity of EFL learners was noted in number of studies (deHaan, Reed & Kuwada, 2010; Olsson & Sylvén, 2015; Sundqvist & Wikström, 2015; Uuskoski, 2011; Sundqvist, 2009; Sylvén & Sundqvist, 2012). The studies that investigated EFL learners’ digital gaming as an extramural English activity investigated the effects of the impact of the frequency of their play on their EFL learning. However, the types of digital games that they played still remains under-researched.

A number of studies in Sweden investigated whether playing digital games in English as part of EFL students’ extramural activities contributed to enrichment of their EFL learning (Sundqvist & Wikström, 2015; Sundqvist, 2009; Sylvén & Sundqvist, 2012; Olsson & Sylvén, 2015). The findings of these studies indicated that spending time on extracurricular activities including digital games correlated positively with the EFL learners’ English proficiency. When comparing EFL vocabulary tests and final grades of non-gamers, moderate gamers and frequent gamers, Sundqvist and Wikström (2015) found that students who play digital games for more than 5 hours a week (frequent gamers) achieved higher scores in their English vocabulary tests as well
as their final grades. These results confirmed the claims of deHaan et al. (2010) that English vocabulary can be enriched through playing digital games. Similarly, the study of Uuskoski (2011) on Finnish EFL students compared English final grades of four different types of EFL gamers. According to hours of play per week, the study categorised participants into non-gamers, casual (0–5h/w), active (5–15h/w), and hardcore (15+h/w) gamers. Uuskoski (2011) found that more time spent on playing digital games positively correlated with achieving higher scores in English. In addition, the study found a significant correlational difference even between non-gamers and casual gamers who spend less than 5 hours a week playing digital games. This confirms the findings of Sundqvist (2009) that even limited time of extramural English activities can be beneficial for EFL learners’ language skills. Uuskoski (2011) tested other factors of digital gaming in relation to EFL learning, such as the effect of playing different digital games genres and EFL English grades. The study found a significant correlation between playing role-playing, multiplayer online, strategy, shooter and simulation games, and achieving higher grades in English.

Therefore, although studies in EFL learning and digital games focus more on integrating digital games in the EFL classroom, the effect of digital gaming as an extramural activity in English has been briefly discussed in a number of studies. Svensson (2018), who conducted a systematic literature review on the effect of extramural English (EE) on EFL students’ language proficiency, claimed that “the number of studies about extramural English and games is small” (p. 14). Finally, it is noted that the focus of most of the abovementioned studies was primarily in regard to the effect of engaging frequently in extramural activities in English on EFL language learning. Uuskoski (2011) is the only found study that tested other factors in relation to language achievement such as game genres, general academic success, studying other languages, and other EE activities.

2.3 English education, technology and digital games in Saudi Arabia

This section of the literature review aims to discuss English education in the Kingdom of Saudi Arabia. Reviewing English education and, specifically, the common teaching pedagogies in Saudi Arabia is important to observe the demand to adapt new teaching methods. In addition, this part reviews gaming preferences and habits of gamers in Saudi Arabia to examine the gaming practices of participants from the same study context. It also reviews how to place the current study in line
with Vision 2030 of Saudi Arabia, and what is the study contribution toward achieving the goals of the vision. Finally, the integration of technology in Saudi education and the use of digital games in education and in EFL is discussed as well, to place the current study in the context of Saudi Arabia literature.

2.3.1 Gaming practices and preferences of Saudi gamers

This study explores how gaming practices (patterns or frequency of play) as well as preference in types of games relate to language learning for Saudi EFL learners. Therefore, a brief overview of the gaming practices, habits and preferences of gamers in Saudi Arabia is necessary.

Digital gaming in general and online gaming is widely spread among adults, youths and children in Saudi Arabia. According to a report published in the Saudi economic newspaper (Almnaifiei, 2009), the digital gaming industry in Saudi Arabia absorbs roughly 3 million digital game consoles every year. In addition, almost every Saudi household has an average of at least one digital game console (Alqahtani, 2016a). Alamri (2018) reported on digital gaming in seven Arabian countries, stating that “Saudi Arabia has the highest number of players of video games among those countries. In general, 65% of Saudi people play video games” (p. 9). Similarly, Almakenzi, Bramantoro and Rashideh (2015) reported that more than 60% of gamers in the Middle East are found to be in Saudi Arabia.

Saudi gamers are mostly expert gamers who are fond of COTS games and consider them as not only entertaining but also educationally valuable. In their study about gaming habits of Saudi EFL learners, Rogers and Johnson (2016) stated that the majority of their participants had a minimum of six years’ experience in playing digital games. Similarly, downloading and playing digital games are among the highest performed activities on mobile phones for Saudi EFL learners (Alshammari, Parkes & Adlington, 2018; Alsayegh, 2016).

In addition to being experts in digital gaming, a large number of gamers in Saudi Arabia across different ages are considered as heavy gamers who spend extended periods of time playing digital games. Alamri (2018) stated that more than 20% of gamers in Saudi Arabia spend more than 10 hours a week playing digital games. However, most Saudi gamers play digital games for an average of five hours every week (Alamri, 2018).

Another aspect of gaming in Saudi Arabia, which might be one reason indicating Saudis as heavy-expert gamers, is that engaging in digital gaming starts in an early age among children.
Researchers in Saudi Arabia investigated digital gaming experience among Saudi school students in different regions of the country. The studies found that school students spend approximately 3–12 hours weekly playing digital games, and that they mostly started engaging in playing digital games at the age of 10 years (Alqurashi, Almoslamani & Alqahtani, 2016; Awadalla, Hadram Alshahrani & Hadram, 2017).

Studies in Saudi literature indicated that gamers in Saudi Arabia are more attached to adventure, war and sport games. The participants in Rogers and Johnson’s (2016) study revealed that they mostly play adventure, simulation, sport and war games either individually offline or as Massive Multiplayer Online Role-Playing Games (MMORPG). Alsayegh (2016) indicated that the most preferable type of games among his (Saudi) participants were adventure and sport games. Alqurashi et al.’s (2016) study, which investigated digital gaming experience among Saudi students, reported that the preferred types of digital games were fighting games, sport games, and adventure games.

To conclude, it is evident that gaming activities in Saudi Arabia and among Saudi youths and adults are expanding exponentially. The majority of studies reported an extremely large amount of digital gaming time among Saudis. Even though gamers in Saudi Arabia play different types of digital games offline and online, the dominant interest was in adventure, sport and online fighting (war) games. The findings of research in the Saudi context inform this study, particularly in relation to the two variables: gaming patterns and types of games in Saudi gamers. The studies provide an estimation of the expected gaming practices and what might be different in the results of the participants’ gaming practices and preferences in this study.

2.3.2 English education and teaching pedagogy in Saudi Arabia

The ministry of education Saudi Arabia introduced teaching English language in intermediate and secondary schools around the 1950s, leaving the first six years of primary school in Arabic only. In addition, one of the main core subjects in universities is English as a foreign language. However, the English language proficiency level of intermediate, secondary, as well as university students is still considered to be unsatisfactory (Alseghayer, 2007; Alghamdi, 2014). The reasons for this low level of English proficiency among Saudi students vary from psychological, technical, and administrative obstacles, in addition to difficulties related to the education system or teaching pedagogies.
One of the main causes of the low English level of students who study in Saudi Arabia is associated with the traditional teaching methods that have been and still are employed in classrooms. Alseghayer (2007) argued that “traditional teaching methods in our schools have contributed to unsatisfactory results in English language instruction, especially the Audio-Lingual Method and Grammar Translation Method” (p. 1). In addition, Alghamdi (2014) claimed that “if teachers have a flexible designed English curriculum, their ability to apply various pedagogical practices will be increased” and “if teachers apply various pedagogical practices in the classrooms, there is a chance that the positive outcomes in the class and the ability for the students to learn will be increased” (p. 331). Alghamdi (2014) added that students’ voice should be considered and will lead to school reform and improved teaching methods and pedagogical practices. Moreover, “EFL instructors need to rethink traditional, conventional conceptions of EFL curriculum, teaching, and learning in Saudi Arabia for improved teaching and learning outcomes” (Alghamdi, 2017, p. 305). The participants in Alghamdi’s (2014) study reported on their experiences in studying English in Saudi Arabia and in Canada. The participants stated that in Saudi Arabia there was no variety of teaching methodologies, and that teachers rely mainly on books and rarely use other resources or tools to engage students and motivate them to learn the language. On the other hand, in Canada teachers use different classroom strategies, technologies and materials to teach English and “we have fun while we are studying English” (p. 332).

The inadequate utilisation of technologies and other language learning aids to engage EFL learners is one of the factors in the unsatisfactory outcomes of English proficiency in Saudi Arabia (Alrabai, 2016). Fakieh Alrabai (2016) investigated some of the factors that contributed to the low achievement in EFL among Saudi students. He argued that “in English language classes in Saudi Arabia, teachers are considered authoritative characters who dominate the learning process; they adopt the role of presenters of knowledge rather than facilitators of learning” (p. 4). Alrabai (2016) stated that to improve EFL learning outcomes in Saudi Arabia, teachers should be “trained on how to utilise the most up-to-date teaching methodologies and modern technology (devices and applications) in EFL teaching” (p. 11). In regard to curriculum, Alrabai (2016) argued that it should include communicative activities such as games, puzzles and role plays. In addition, effective English teaching aids should be provided such as videos and computers. Therefore, many EFL students in Saudi Arabia lack the skills and motivation to learn English, which can be observed by their low English scores (Al-Zahrani & Rajab, 2017).
Therefore, in line with the recent significant changes that are taking place currently in Saudi Arabia, it is of great importance to consider the improvement of traditional and conventional methods of EFL teaching.

2.3.3 Vision 2030 of Saudi Arabia

In 2016, Saudi Arabia Vision 2030 was introduced. Vision 2030 involved a wide range of plans, including economic, social and developmental programs. One of the main plans of Vision 2030 was to improve the education sector by implementing new strategies and techniques such as: improving educational environments in schools and classrooms, planning of advanced educational curricula, training teachers and educators to adapt and use new teaching methodologies, and finally providing educators and educational institutions with the latest technologies and supporting materials that can facilitate learning and contribute to immerse learners in the learning process (‘Education and Vision 2030,’ n.d.).

Government sectors including the Ministry of Education joined the National Transition Program, which aims to implement the goals of Vision 2030. In its website, the Ministry of Education listed its plans for the National Transition Program which included several programs and workshops that aim to improve and change education in Saudi Arabia. The Ministry of Education stated that some of the current challenges that hinder improving education in Saudi Arabia are:

1. Weak educational environment that does not promote creativity and innovation;
2. Low quality curricula;
3. Reliance on traditional teaching methods.

According to the Ministry of Education, one of the main ways to improve education in line with Vision 2030 is to improve teaching methods and pedagogies so that they are student-centred, and not teacher-centred. Another way is to build a stimulating educational environment which can attract and interest learners. Finally, providing and linking schools and classrooms with a system of supporting and integrating services that can facilitate learning and engage learners (‘Education and Vision 2030,’ n.d.).

Since Vision 2030 was launched, only two studies in Saudi literature have reflected on EFL teaching and learning in line with the demanded changes to achieve the goals of Vision 2030. Al-Zahrani and Rajab (2017) argued that one of the important points of Vision 2030 is to establish an
outstanding education that overcomes difficulties encountered in international communications. In addition, Vision 2030 aims to achieve an inclusive improvement of education across all government educational institutions which includes improving EFL teaching and overcoming current obstacles in this field. Al-Zahrani and Rajab (2017) explored EFL teachers’ attitudes and perceptions regarding implementing Vision 2030 in the context of EFL in Saudi Arabia. One third of the study sample, that consisted of 550 female and 450 male Saudi EFL teachers, were unsatisfied with the curriculum related to teaching English language. Samir Fatani, an EFL researcher in Saudi Arabia, proposed ten ideas to improve teaching EFL to meet the demands of Vision 2030. One of the main ideas he proposed was to activate the role of technology, mobile applications and other extra materials in learning English (Fatani, 2016).

Therefore, there is a noticeable desire to change and improve education in Saudi Arabia, particularly in the field of EFL. The improvement of education and EFL teaching should include improving EFL teaching environment, increasing students’ motivation to learn EFL, and actively using extra activities and teaching aids that ensure the involvement of EFL learners (Fatani, 2016). One of the most important ways to achieve these goals is to employ contemporary teaching methods that utilise the latest technologies and communicative tools. Integration of technologies in EFL can lead to making use of digital games in EFL context, either by accommodating such games in EFL classrooms or using them as out-of-class extra activities.

2.3.4 Technology in EFL education in Saudi Arabia

The recent studies in Saudi Arabia either in general or EFL education contexts focus mainly on the integration of technology to facilitate the learning process. Studies discussed perceptions and attitudes of learners, educators, and policymakers on using and integrating different technologies in classrooms and curricula in different educational levels from primary school to university (Al-Ismaiel, 2013; Zafar, Mueen, Awedh & Balubaid, 2014; Ali 2013; Mofarreh, 2016; Arshad, Ahmad & Siddiqui, 2018; Bingimlas, 2018).

In regard to the EFL educational context in Saudi Arabia, studies discussed incorporating technologies in the EFL classroom to assist and engage Saudi language learners (Shaabi, 2010; Morris, 2011; Alresheed, Raiker & Carmichael, 2017). Other studies aimed to investigate the acceptance, perceptions and attitudes of EFL learners and educators toward integrating technologies in EFL learning (Farooq & Javid, 2012; Saqlain & Mahmood, 2013; Al-Kathiri,

Therefore, research in integrating and utilising technologies in education and specifically in EFL teaching has attracted the attention of researchers in Saudi Arabia in the past decade. More recently, researchers in Saudi Arabia have started to explore the effect of digital games on EFL learning. This will be discussed in the next section.

2.3.5 Digital games in EFL education in Saudi Arabia

The area of digital games and EFL learning is considered a new research area in the Saudi EFL context (Alsayegh, 2016; AlShaiji, 2015; Alqahtani, 2016; Alshawi, 2016; Bataineh, 2014). Most of these studies focused mainly on the effect of educational digital games on EFL learning (Fallata, 2013; Alshawi, 2016; Bataineh, 2014; AlShaiji, 2015), or discussed the effect of COTS digital games on specific language skills (e.g. vocabulary or communication and pronunciation) (Alsayegh, 2016; Alqahtani, 2016a; 2016b). While the majority of these studies employed a mixed methods approach, two studies were explorative in nature and investigated the perception of Saudi EFL learners regarding the utilisation of digital games in language learning (Rogers & Johnson, 2016; Alqahtani, 2016b).

It was noted after an extensive search of Saudi Arabia literature about the effect of digital games on EFL learners that there is a limited number of studies in this area, which was also supported by Alsayegh (2016). The literature search conducted in this study aimed to specifically locate studies that involved Saudi EFL learners and investigated either the effect of digital games on their EFL learning or examined their perceptions about learning. The search of literature used the specific terms of “Saudi, EFL, digital games, video games, and computer games” to find relevant studies only. Therefore, studies that were conducted on Saudi EFL teachers were excluded as they do not serve the main purpose of this research. Due to the limited number of studies in Saudi literature, a description of each of the studies related to the purpose of this research is presented.

Four studies explored the use of COTS games by utilising them in experimental research (Alsayegh, 2016; Alqahtani, 2016a), or discussed learners’ perceptions about COTS games
Alqahtani (2016b; Rogers & Johnson, 2016). Alsayegh (2016) investigated issues and attitudes in relation to teaching English vocabulary via COTS digital games to Saudi university students. In his PhD research, Alsayegh (2016) conducted an experimental mixed methods study including pre- and post-tests of EFL learners' vocabulary acquisition. The researcher distributed students into control and treatment groups and utilised the use of selected COTS games which could be downloaded on students’ mobiles and tablets as a method for vocabulary instruction for the treatment group. The majority of the participants in the treatment group considered using digital games to be motivating, entertaining and amusing. They reported feelings of improvement in their proficiency and vocabulary retention after engaging in digital games. These perceptions and attitudes were confirmed by the vocabulary acquisition pre-post-test results, which indicated a significant increase in scores of the treatment group.

Alqahtani (2016a) discussed how the immersion of Saudi EFL students in online gaming enhanced students’ pronunciation of the English phoneme /v/. Most Saudi EFL students struggle in pronouncing this English phoneme as a result of the nonexistence of /v/ sound in the Arabic phonological system. Therefore, Saudi EFL students mostly do not differentiate between the phonemes /v/ and /f/. In his experimental study, Alqahtani (2016a) found that immersion in social interaction in English via MMORPGs improved students’ pronunciation of the English phoneme /v/ throughout the four weeks of intervention. In another article on the same study, Alqahtani (2016b) investigated EFL students’ attitudes of communicating in English using MMORPGs. This qualitative study revealed diverse attitudes and perceptions of Saudi EFL learners in regard to engaging in online interactions through MMORPGs; “however, the degree of their overall satisfaction with MMORPGs as a tool to learn EFL was high throughout the four weeks of the immersion experience” (Alqahtani, 2016b, p. 329).

Rogers and Johnson (2016) also conducted a qualitative study to explore gaming habits, personal attitudes and cultural views toward gaming, and toward gaming for language learning among Saudi English language learners. The study’s participants reported that they enjoy COTS digital games and that these games positively impacted their language learning. They also “reported significant learning of English listening, speaking, and reading skills from gaming” (Rogers & Johnson, 2016, p. 599). Additionally, they stated that digital games taught them history, culture, literature, military science and math.
As illustrated next, EFL learning through educational games (Alshawi, 2016) received most of the attention of EFL researchers in Saudi Arabia, specifically in relation to EFL vocabulary learning (AlShaiji, 2015; Fallata, 2013; Abdalla, 2015; Ali Mohsen, 2016; Bataineh, 2014). Alshawi (2016) conducted a quasi-experimental study investigating the effect of using educational video games in increasing motivation of Saudi students learning English. The study aimed to indicate which educational video games’ designs or characteristics motivated Saudi students to learn more English language. The findings of the study “illustrated that the students interacted to play games no matter if the game had visual cueing or not” and that “students tended to be more motivated with games that included questions related to the conversations” in the games (p. 67).

AlShaiji (2015) discussed how educational video games can promote English vocabulary retention among young Saudi children. The researcher conducted an experimental study between two groups of Saudi kindergarten children to investigate the effect of video games on their vocabulary learning. In her study, AlShaiji (2015) concluded “that video games have positive effects on vocabulary learning process in kindergarten classes of Saudi children. Using video games in the classroom results in facilitating the English vocabulary learning among kindergarten’s children” (p. 130).

A Saudi English language educator Dana Fallata aimed in her doctoral dissertation to investigate the role of edutainment in teaching reading and vocabulary to English language learners. Fallata’s (2013) study was conducted in an adult English language institution in Northern California on 32 students from different ethnicities, including 11 students from Saudi Arabia. The researcher divided students into control and treatment groups and incorporated a game “Quiz let” as an edutainment method for vocabulary instruction to the treatment group. The findings of the Fallata (2013) study showed that “using edutainment methods in vocabulary instruction was engaging, motivating and gave students confidence to communicate in English as their second language” (p. v). The results of students’ weekly quizzes indicated a significant increase of the quizzes average scores in the treatment group. Fallata’s study (2013) provided evidence of the positive effect of using edutainment games as a teaching method of reading and vocabulary.

Another study by Abdalla (2015) addressed the application of edutainment in learning EFL vocabulary among Saudi EFL students. Thirty intermediate students were assigned to two groups and participated in a nine-weeks experiment. The experimental group studied English vocabulary through two selected educational gaming websites, while the control group used the conventional
methods of activity-based lessons. After conducting pre- and post-vocabulary tests, the findings of the study indicated that the experimental group achieved significantly higher results in the post-test. Abdalla (2015) stated that the experimental group participants revealed a general preference for the idea of online learning through educational digital games.

Ali Mohsen (2016) studied incidental vocabulary learning through engaging 43 Saudi EFL learners in an educational online simulation game. An experimental study was conducted where the experimental group (players) participated in a virtual knee surgery simulation game and the control group (viewers) watched a video of the same game. After engaging in 45 minutes of playing/watching the game, the two groups undertook a video comprehension and post-vocabulary tests. The findings showed that the experimental group significantly outperformed the control group in both tests. Ali Mohsen (2016) stated that “the pedagogical implications of this study suggest that interactivity in language input is crucial in facilitating second language acquisition” (p. 863).

A study by Bataineh (2014) aimed to investigate the effect of using educational website games for Saudi students’ reading comprehension, vocabulary acquisition and motivation. An experiment was conducted with two groups of 20 Saudi students from primary schools who were studying English as one of the subjects, while all other content was taught in Arabic. Bataineh (2014) concluded that website games assisted reading comprehension and vocabulary acquisition among Saudi students, and that website games motivated students and engaged them in the teaching process. Bataineh (2014) suggested that “there is a need for more computerized games to teach other language components and skills” (p. 100).

To sum up, the studies presented previously included the latest captured literature of digital games and English language learning in the Saudi context. It is clearly noticed in this section that the vast majority of studies in Saudi Arabia literature about digital games and EFL learning focused mainly on the integration of educational digital games. In addition, although a few located studies explored COTS games, none them tested the relationship between students’ practices with COTS games as an extramural activity or during their leisure play time and its effect on their EFL learning. Finally, these reported studies conclude the literature review regarding this research, which prepares to situate the position of the study. Based on this literature review, an identification of the gap in the literature, which this study aims to contribute to, is presented at the end of the chapter’s conclusion.
2.4 Summary and conclusion

This literature reviewed in this chapter is in an interdisciplinary field that focused on two overlapping areas: 1) English language education, and 2) digital games. The term ‘digital games’ was adopted for this study as a generic term inclusive of a variety of games such as video, computer and mobile games. Studies in the field of digital games distinguished between the two types of games that have been studied in educational settings: educational games and COTS games. The researchers analysed advantages and disadvantages of both.

Researchers summarised the main limitations in educational games as follows: educational games were not as engaging as COTS games; students were not familiar with them; and they were usually available, and can be played, only in schools (Contai, 2002; Williamson et al., 2005). On the other hand, researchers pointed out that educational games were the best connection between fun and learning because they share some features with COTS games, and if they are chosen carefully, they can provide playful experiences and support educational goals (Ibrahim et al., 2012; Dondlinger, 2007).

The research studies reviewed COTS games from different perspectives and classified them into genres/types. They identified eight types of COTS games according to the games’ content of play and theme (Action, Adventure, Fighting, Puzzle, Role-Playing (RPG), Simulation, Sport, and Strategy games).

The main field that studied digital games in English language learning was CALL (computer assisted language learning). the research studies extended this field to yield the new sub-field of digital game-based language learning (DGBLL) which divided digital games into CALL games (educational games) that support second language learning; and commercial off-the-shelf (COTS) games that have not been designed for learning (Cornillie et al., 2012). In the field of English language learning it was found that some COTS digital games were considered as a great teaching tool. For example, the availability of multiplayer online role-play games provided notable amounts of interaction in English, required a significant volume of reading and writing, provided cross-cultural contexts, and an engaging environment that assured participation in activities (Steinkuehler, 2004; Black, 2005). In addition, some researchers argued that language learning should be extended to outside of the classroom, and not restricted to the integration of digital games within the classrooms. Outside classroom gaming was perceived to enhance communication skills away from the constraints of academic language, because of communicative
activities in digital gaming which might not be encountered in classrooms (Johnson, 2010; Zheng et al, 2012).

Most studies, however, focused on the use of digital games within the classroom contexts to effect specific, fundamental English skills (reading, writing, speaking, and listening). Some studies discussed the potential positive effect of playing digital games on EFL students’ listening and reading skills (Chen et al., 2012; Chik, 2014; Lu et al., 2011). Others explored the effect of playing digital games on communication skills, speaking and listening, and students’ willingness to use English to communicate (Sourmelis et al., 2017; Wu et al., 2014; Reinders & Wattana, 2015). However, limited number of studies provided empirical data on the effects of digital games as part of Extramural English (EE) activities on EFL learners’ achievement (Olsson, 2012; Sundqvist & Wikström, 2015). These two studies showed a positive correlation between frequently engaging in EE and achieving higher grades in specific EFL skills (such as: writing, listening and vocabulary).

The review of digital games and language learning also included exploring studies that investigated the possible impact of different types of digital games, and different gaming patterns among gamers on their EFL learning. Various studies in digital games and language learning clearly identified adventure, simulation, and role-playing games as providing plentiful English language exposure and use to gamers (Bronstring, 2012; Cornillie et al., 2012; Whittaker, 2013; Chik, 2014). Others captured perceptions of EFL teachers and learners of the impact of these games on EFL learning (Chen et al., 2012; Rankin et al., 2006; Sylvén & Sundqvist, 2012). The findings of these studies informed this study by identifying the categorisation of digital games in the variable of ‘types of games’. These studies also helped in shaping questions in student focus groups that related to types of games and EFL learning. On the other hand, gamers’ patterns of playing digital games and its effect on their language learning have been explored thoroughly. Many researchers have examined if frequency of playing digital games (such as hours per day, days per week, and years of play) among EFL learners has an effect on their EFL learning. Rau, Peng and Yang (2006), Rogers and Johnson (2016) and Chik (2011) discussed that long period of exposure to digital games – in regard to years – could positively influence EFL students’ language learning. Other studies found positive correlation between frequency of playing in regard to number of days (Sylvén & Sundqvist, 2012; Rankin et al., 2006), or number of hours of play...
(Frasson et al., 2018; Yılmaz et al., 2018) on EFL learning. The abovementioned studies of the frequency of playing digital games also informed the patterns of play variable in this study.

The last section of this literature review narrowed the scope of studies to only include the literature in Saudi Arabia context. First, the review of Saudi literature started by discussing the practices and preferences of gamers in Saudi Arabia (the study context). According to different studies, it was noted that Saudi gamers can be generally classified as heavy and expert gamers. They are more involved in COTS digital games and especially adventure, online role-playing, and sport games. After that, a brief history of English education in Saudi Arabia was presented. Then, the review described the teaching pedagogy in Saudi Arabia, which also identified reasons behind the unsatisfactory English proficiency level of Saudi students (Alseghayer, 2007; Alghamdi 2014 & 2017; Fakieh, 2016; Al-Zahrani & Rajab, 2017). Then, and in line with the needed transformation in education and teaching pedagogy in EFL as well as other fields, the literature review explored Vision 2030 of Saudi Arabia. The vision aims to improve the education sector by implementing new strategies and techniques in schools, classrooms and curricula. Some Saudi Arabian recent studies and articles reflected on EFL teaching and learning in regard to the demanded changes to achieve the goals of Vision 2030 (Al-Zahrani & Rajab 2017; Fatani, 2016). These studies revealed the need to improve EFL curriculum as well as teaching methods and strategies, activating the role of technology, mobile applications and other extra materials such as digital games in EFL learning.

The literature review concluded with a detailed exploration of the studies that discussed digital games and EFL learning in the context of Saudi Arabia. Only a small number of recent studies were identified in this field. Most of these studies investigated the effect of educational digital games either on children’s vocabulary retention (AlShaiji, 2015), English language learners’ reading comprehension (Fallata, 2013), or school students’ vocabulary, reading, and motivation (Bataineh, 2014; Ali Mohsen, 2016; Abdalla, 2015; Alshawi, 2016). These studies clearly showed that Saudi EFL students (kindergarten to postsecondary) reacted positively toward the integration of digital games in facilitating EFL learning. They also provided significant evidence of the impact of these games on Saudi EFL learning, especially vocabulary. Other studies explored the habits, attitudes and perceptions of EFL learners towards COTS games for language learning (Rogers & Johnson, 2016), and issues and attitudes towards using COTS games in vocabulary teaching in classrooms for university students (Alsayegh, 2016). Studies also
considered the effect of online interaction in MMORPGs in improving the pronunciation of /v/ phoneme among Saudi EFL learners (Alqahtani, 2016a) and their attitudes towards online interaction in these games (Alqahtani, 2016b). The last-mentioned studies revealed that Saudi EFL learners were fond of COTS games and that they can be considered as frequent and expert gamers. It was also evident that although Saudi students’ experiences in online gaming were not entirely positive, the social interaction was found to be beneficial in improving their English pronunciation.

Overall, the literature on digital games in education and EFL learning is explorative in nature, with many studies being conducted on a small number of participants (Arias, 2014). For example, the sample size of some studies mentioned previously (Zheng et al., 2012; Squire et al., 2005) did not exceed 15 students/participants. It is known that qualitative methods are beneficial and appropriate for exploration of unknown areas of knowledge in specific contexts. While sufficient evidence has been found about the impact on digital games on EFL, the findings of qualitative studies cannot be generalised to larger populations or other contexts (Arias, 2014). Some quantitative studies found in the literature of digital games and language learning provided findings of the effect of either specific types of games on EFL learning or the effect on specific aspects of language learning. Further quantitative studies are required to inform evidence-based educational practice in the area of EFL and digital games. Therefore, it appears that there is a limited body of empirical studies on EFL learning and entertainment (non-educational) digital games practices among EFL learners. Specifically, the lack of such studies can be seen clearly when considering the context of this study: Saudi Arabia. In addition to the limited number of studies in the Saudi literature on digital games and language learning, the majority of these studies discussed digital games within educational settings only. For example, studies that featured COTS games investigated the application of these games as an in-class intervention. However, this study is contributing to the body of literature in a Saudi Arabian context seeking possible statistically significant relationships between COTS (non-educational) digital games practices as part of EFL students’ leisure play time and their EFL achievement. In addition, students’ perceptions were captured to support the findings of quantitative data to give a stronger indication of the results of the study.

To conclude, it was identified in this literature review that the idea of integrating digital games (educational and COTS) in language learning has been investigated thoroughly in the last few decades. However, a smaller number of studies have examined EFL learners’ practices with
digital games (specifically COTS) during their leisure play time in relation to their language learning. Additionally, when considering the Saudi Arabian literature, no study was found which tested the relationship between COTS gaming as an Extramural English (EE) activity and EFL learning. Therefore, the lack of literature on the relationship between digital gaming as an EE and EFL learning, and the nonexistence of such studies in the Saudi Arabian literature, was evident. This clearly identified the gap of literature that this research study aims to fill.
CHAPTER 3: METHODOLOGY, RESEARCH PROCESS AND THEORETICAL FRAMEWORK

This chapter presents the research context for the study, its theoretical and conceptual framework. Further, it provides a rationale for the methodology that was employed and provides a detailed account of the participants, specific methods of data collection and analysis, used in the study.

This study aimed to examine the playing of digital games by investigating the frequency of playing, the type of games played, and the amount of social interaction which occurred during playing, in relation to students’ language achievement (SLA) at an English Language Centre (ELC) in Saudi Arabia. The study adopted a mixed methods design (Creswell, 2013), starting with quantitative data in the form of a questionnaire, then followed with qualitative data was gathered from focus groups. Therefore, the presentation of the research methods is structured in two main sections, (1) the quantitative and (2) the qualitative. Each section includes research questions, research design, participants and data collection methods. In addition, the chapter discusses research context, data analysis procedures, and the validity of the research.

3.1 Theoretical framework

The theoretical framework is considered as the lens that a researcher uses to view the study. Grant and Osanloo described the theoretical framework as “the blueprint for a house – you (the student and researcher) are the architect who is charged with choosing what you are going to build and how the property will be constructed as you imagine it” (2014, p. 14). Two interrelated theories constituted the theoretical framework of this study: Vygotsky’s sociocultural theory (SCT) and Marsick and Watkins’ (1990; 2008) informal and incidental learning theory.

3.1.1 Sociocultural theory

Vygotsky’s sociocultural theory of learning and development is based on understanding the role of the cultural and social roots of human mental processes; and the role of cultural tools in the advancement of human higher mental capacities (Johnson, 2004; Chen, 2016). In his sociocultural perspective, Vygotsky (1978) demonstrates that the development of human consciousness is
mainly social, not cognitive (Nardi, 1998) and that social interactions significantly contribute to the psychological development of an individual (Lightbown & Spada, 2006).

Based on his previous perspectives, Vygotsky determined an instructional area which he named the “zone of proximal development” (ZPD) (Vygotsky, 1978, p. 84) where he combined two levels of cognition: (1) the individual, and (2) social levels. “The Zone of Proximal Development bridges the gap between what is known and what can be known. Vygotsky asserts that cognitive change occurs within the zone of proximal development” (Fallahi, 2012, p. 13). In the ZPD, assistance is provided by knowledgeable individuals or tools to beginning learners in order to facilitate cognitive and psychological development (Johnson, 2004; Shaabi, 2010). According to Vygotsky (1978; 1986), these tools can be physical materials such as a book, a toy, a musical instrument, as well as virtual tools, such as language, art, or music (Zapata, 2002; Shaabi, 2010). In addition, the learning process is “a complex mediated act” (Vygotsky, 1978, p. 40) as portrayed in Vygotsky’s triangle which shows the effect of mediating artefacts on people’s understanding of their social environment and the ways they use to connect and interact with the world. Digital technology or games can be considered as a tool that can mediate human learning (Raheem, 2011).

3.1.1.1 Social interaction and scaffolding in the zone of proximal development.

A support structure must be used to allow sufficient instruction to take place in the ZPD which is identified by Vygotsky as “scaffolding.” The scaffolding concept is anchored in Vygotsky’s sociocultural theory. With the help of scaffolding, learners will be able to achieve what they could not do individually without support. Scaffolding can be provided by teachers, or any more knowledgeable person, that gives learners the opportunity to expand their existing skills and knowledge by assigning them with tasks that believed to be difficult to attain without assistance, but can be managed via teachers, peers, or support from technology (Raheem, 2011). The term scaffolding, even though not originally used by Vygotsky, was introduced by Wood, Bruner and Ross (1976, in Verenikina, 2008). Scaffolding is considered as highly important in EFL learning (Hammond & Gibbons, 2005). It is also seen as a process that allows learners to resolve problems, perform tasks, or obtain assigned objectives considered to be beyond their reach without such assistance. Teachers can work effectively in the ZPD with the assistance of this support structure,
which is believed to be one of the most recommended pedagogical techniques in education (Sotiriadou & Hill, 2015).

3.1.1.2 Digital games, and sociocultural theory.

The sociocultural theory was developed as a theory of psychological development and learning. Over the years Vygotsky’s notions were introduced and applied widely to research in a variety of areas, including the use of ICT in education and industry (Nardi, 1998; Kaptelinin & Nardi 2006; Hardman, 2005; Falloon, 2012; Verenikina, 2010).

The impact of digital games on English language learners can be investigated through the lens of Vygotsky’s sociocultural theory which emphasises the role of social interactions and scaffolding in learning. As demonstrated in the previous chapter, online games provide powerful environments for social interactions (written or oral) with native speakers of English as target language for EFL players. Social interactions stimulated by digital games include a range of opportunities from reading tips from other players to verbal or written chats to engaging in collaborative dialogues. Specifically, social interactions in digital games can be provided in different means; some are virtual, and others are in school or classroom settings:

- Interaction with other gamers during playing games
- Interaction with virtual characters encountered in games
- Interaction with other players in blogs and forums to discuss gaming issues or to collaborate
- Interaction with friends and peers to talk about games experience.

(Chen & Huang, 2010; Sylvén & Sundqvist, 2012; Peterson, 2012)

Such interaction can play a major role in building students’ language learning skills and abilities because according to Vygotsky language develops in social interactions with more experienced (knowledgeable) members of society (Vygotsky, 1986). Khine and Suja’ee (2008) argue that a well-designed digital and computer game can function as the mentor or more knowledgeable peer (teacher) to assist players/students’ progress from their current level of language development to their potential level of EFL acquisition. Sylvén and Sundqvist (2012) theorised that digital games can provide EFL learners with an input of target language at a level that falls within the player’s zone of proximal development. This will provide learning experiences
considered as not too hard for the students to accomplish by themselves, where “the learners are challenged yet find the game tasks doable” (p. 306) with the support of these digital games contexts and other gamers (scaffolding). Therefore, sociocultural theory can be used in this study due to its orientation to consider playing digital games as not just an individual activity, but as a social interactive setting that can provide English learners with plenty of opportunities to acquire the language. This theoretical framework indicates the need for the study of digital games to be framed in a social context and investigate how social interactions might affect EFL learning.

Finally, sociocultural theory provides understanding of play experiences as a powerful environment for learning which is driven by the goal of the game but not learning (Vygotsky, 1976). One of the effective ways of learning in play might happen when learning becomes a tool to achieve the aim of the game. A vivid example is presented in a study underpinned by sociocultural theory where young children’s literacy skills were enhanced in a computer game club ‘owned’ by an imaginary figure of a Wizard who lived ‘online’. Engaging in a playful communication with the Wizard through writing improved the children’s ability to write and read for meaning (Cole, 1996). Therefore, meaningful language learning occurred when it was used as a tool to achieve a playful goal which is consistent with the second part of the theoretical framework used in this study – the theory of incidental learning.

### 3.1.2 Informal and incidental learning theory

The theory of informal and incidental learning was introduced by Marsick and Watkins (1990). They define informal and incidental learning by comparing and contrasting it with formal learning:

Formal learning is typically institutionally sponsored, classroom-based, and highly structured. Informal learning, a category that includes incidental learning, may occur in institutions, but it is not typically classroom-based or highly structured, and control of learning rests primarily in the hands of the learner. (Marsick & Watkins, 1990, p. 12)

Marsick and Watkins (1990) defined incidental learning as a “byproduct of some other activity, such as task accomplishment, interpersonal interaction, sensing the organizational culture, trial-and-error experimentation, or even formal learning” (p. 12). They suggested that informal learning “almost always takes place although people are not always conscious of it” (Marsick & Watkins, 1990, p. 12).
Marsick and Watkins (1990) and Garrick (1998) linked informal and incidental learning to other similar theories, such as learning “en passant” (Reischmann, 1986). Marsick and Watkins (2001) argued that “informal and incidental learning take place wherever people have the need, motivation, and opportunity for learning” (p. 28). According to a review conducted by Callahan (1999) informal and incidental learning are applicable and practically applied in various societies and fields. For example, the theory has been researched in the private and public sectors, higher education institutions, schools, professional organisations, museums and exhibitions, religions and beliefs, in addition to families and cultures. Moreover, “informal and incidental learning is at the heart of adult education because of its learner-centred focus and the lessons that can be learned from life experience” (Marsick & Watkins, 2008, p. 1).

Cross (2011) notes that almost 80% of learning in the workplace is informal, such as learning through trial and error. According to Cross (2011), the ability to control the learning objectives is what distinguishes informal learning from formal learning. Informal and incidental theory originally applies to learning at the workplace. However, the influential cultural theorist Huizinga, who is often cited by digital game researchers, compared the notion of work and learning to the notion of play (cited in Smith, 2014). In addition, the idea of learning a language informally and incidentally has been used in different research studies. These studies identify learners’ exposure to the target language through digital games, social media, or mobile phones as an informal and incidental language learning (Blomberg, 2014; Dettori & Torsani, 2013).

The informal and incidental theory is applicable to this study because it indicates that playing digital games predominantly takes place in informal settings. Learners playing English-oriented digital games with no prior knowledge in English are most likely to learn incidentally in this informal situation. The proposed framework investigates: 1) whether playing digital games affects English learning incidentally in such informal settings; 2) is there a significant difference in language achievement among learners who play digital games frequently and others who do not? And is there a significant difference in language achievement among learners who play different types of digital games?

3.2 Research context

The research context of this study was the English Language Centre (ELC) at the Institute of Public Administration (IPA) in Riyadh, Saudi Arabia. A full description of the English language course
and the teaching pedagogy with an outline of subjects, tasks, and timetable is provided. In addition, available facilities and teaching aids and services will be taken into account. The general context of IPA is described in Appendix C.

3.2.1 **English Language Centre (ELC)**

The ELC is located in the main campus of the IPA. Four teaching sessions run each academic year, each session is eight/nine weeks in length, in addition to a summer session for enrolled students only. Teachers at the ELC must have completed at least a Masters’ degree in TESOL/TESL/TEFL or Applied Linguistics. Including instructors from Saudi Arabia, diverse cultures and nationalities were represented among the faculty staff members of the ELC. The number of students who join the ELC every year is approximately 1700–2000 students. The study was conducted on EFL students who were studying English in a non-English speaking country. The study was purposefully performed in an English as a Foreign Language (EFL) setting to assure that students’ exposure to English was limited due to the non-English speaking environment.

The choice of the ELC as the research site of the current study was justified as follows. First, the ELC provides intensive EFL training programs to many governmental employees from different sectors, as well as high school and college/university graduates. Second, the researcher has been working as an EFL instructor, thus he had access to the facility, classrooms, and offices and full cooperation from the director and teachers. Third, the researcher’s experience was that many students at the ELC were gamers. Therefore, the ELC at IPA was chosen as a suitable research site.

3.2.2 **Segregated setting**

The ELC is a segregated male institution. Therefore, the students and teachers were all male which a typical educational setting in Saudi Arabia is. There is also a female section of IPA and they have an English Language Centre as well. For cultural reasons, access to this female section of the IPA, by a male researcher, would not be appropriate in the Saudi Arabian context.
3.2.3 Teaching pedagogy

The teaching pedagogy at the ELC is based on a very traditional model of classroom-based teaching. Teachers lecture students during a 50-minutes class. The ELC strives to be a leader in the English teaching field by trying to offer an academic enhanced teaching and learning environment. This includes classrooms equipped with the latest teaching technologies (projectors, smartboards, and sound systems) and a designated computer for each student during lab sessions in addition to other advanced teaching methods. However, some problems and issues have been identified in labs and teaching technologies used at the ELC (Shaabi, 2010).

3.2.4 English language program

The EFL program at the ELC consists of four language levels/courses (beginner, elementary, intermediate, and advanced). Each level runs for eight/nine weeks (a quarter) for an academic year. Prior to enrolling in the ELC, students take a placement test to determine their English level. According to the placement test results, students will start their English program in either level one, two, three, or four. However, taking the placement test is optional; otherwise, students can start immediately on level one. In this study, participants were selected from all four levels.

The first two levels in the ELC (beginner and elementary) teach general English and aim to provide students with basic English skills (reading, writing, listening, speaking, grammar). The second two levels (intermediate and advanced) teach English for Specific Purposes (ESP) and aim to provide students with English language with specific focus on their diploma majors. Subjects weekly hours distribution is as follows:

1. Grammar (6 hours) weekly – two hours in lab.
2. Writing (5 hours) weekly – one hour in lab.
3. Reading (5 hours) weekly – one hour in lab.
4. Listening (3 hours) weekly – one hour in lab.
5. Speaking (3 hours) weekly – one hour in lab.

The total time commitment is 24 hours a week which includes 6 hours in the lab. According to the ELC data base, the average size of EFL classes is usually 25–30 students. However, the number might reduce in some classes due to students who drop out or who cannot pass to the next level (repeaters). The number of classrooms in the ELC is usually greater than 24.
regular classrooms in addition to 12 Computer Assisted Language Learning (CALL) laboratories. Each CALL lab is equipped with around 25 networked computers for students. The language course is considered as intensive, therefore adding extra material or out-of-curriculum activities can be seen as challenging.

As all of the language skills are integrated, students are required to maintain a passing grade across all skill courses (reading, writing, listening, speaking, grammar) in order to pass to the next level. Failure in one skill course will lead to repetition of all of the current level. The total grade in all skill courses is 100; listening (40) and speaking (60) marks are added to each other to be 100. The passing grade in all courses is 60% (listening + speaking). Table 3.1 below shows grades distribution:

Table 3.1 Grades distribution in the English language program.

<table>
<thead>
<tr>
<th></th>
<th>Participation</th>
<th>Assignments</th>
<th>Quizzes</th>
<th>Mid-term Exam</th>
<th>Final Exam</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grammar</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>20</td>
<td>40</td>
<td>100</td>
</tr>
<tr>
<td>Writing</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>20</td>
<td>40</td>
<td>100</td>
</tr>
<tr>
<td>Reading</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>20</td>
<td>40</td>
<td>100</td>
</tr>
<tr>
<td>Speaking</td>
<td>10</td>
<td>--</td>
<td>20</td>
<td>--</td>
<td>30</td>
<td>60</td>
</tr>
<tr>
<td>Listening</td>
<td>--</td>
<td>--</td>
<td>12</td>
<td>12</td>
<td>16</td>
<td>40</td>
</tr>
</tbody>
</table>

Students are entitled to one repetition only in levels one, two, and three, as well as another exceptional repetition in level four. Otherwise, students who repeated twice (and the other repetition is not in level four) will be expelled automatically by the ELC registration system.

The design of the English language program at the ELC took into account improving students’ linguistic skills above the average level regarding the ability to use spoken and written English. This measurement is in accordance with level B2 of the Common European Framework of Reference for Languages (CEFR). Diploma students can wave the English program requirement and start their major immediately if they present one of the following English test scores: 5.5 IELTS / 65 TOEFL iBT / 520 TOEFL paper. These scores are considered as equivalent to completing the English language program.
3.2.5 Role of researcher

The researcher is a faculty teaching staff member at the institution. He worked as an English instructor at the ELC prior to commencing his PhD studies. The researcher collected all the data (questionnaires and student focus groups). The student participants were not taught by the researcher at any time. All teaching staff were considered as colleagues of the researcher with no sub-ordinary relationship.

3.3 Research design

The mixed methods design assisted in investigating the problem from multiple perspectives, using both a quantitative approach by examining the expected relationship between the study variables and qualitatively, analysing perspectives of learners from the qualitative data captured in the questionnaire and the student focus groups. The mixed methods design gave the research quantitative insights balanced with the rich descriptive data from the qualitative data. The quantitative study provided statistically verified relationships between playing digital games and language learning. The qualitative study explored these relationships by investigating the personal experiences of students. Using mixed methods strengthened the study as the collected data were complementary (Teddlie & Tashakkori, 2011). Creswell (2013) states that sequential explanatory mixed methods design “determines the distribution of a phenomenon within a chosen population” (p. 211) which is considered as the general purpose of using this design in the current research. Specifically, the study employed a sequential explanatory mixed methods design (Creswell, 2013) where quantitative data initially collected using a purposefully designed questionnaire followed by the qualitative data in the form of focus groups. The qualitative data aimed to offer more clarification of the findings yielded from the quantitative part. The sequential explanatory mixed methods design is commonly used among researchers who aim to understand the explanations behind their significant and insignificant quantitative findings (Teddlie & Tashakkori, 2011).

Creswell (2013) argues that the role of validation is considered as a measure of how accurate a study is. This study achieved validation by using quantitative and qualitative data collection methods from two sources: (1) students’ questionnaires, and (2) students’ focus groups.

The study was conducted in two phases: (1) phase one: a purposefully designed questionnaire of the overall targeted sample of students. (2) phase two: focus groups with participating students (summarised in Table 3.2 below).
Table 3.2 Research methods overview

<table>
<thead>
<tr>
<th>Phases</th>
<th>Participants (numbers)</th>
<th>Data source (methods)</th>
<th>Research questions</th>
</tr>
</thead>
</table>
| (1)    | Students (379)         | Purposefully Designed Questionnaire | 1. To what extent do digital games relate to English language learning for postsecondary students in relation to the following three factors?  
   a) Type of digital games played.  
   b) Engaging in online social interaction in relation to digital games.  
   c) Frequency of playing digital games. |
|        |                        | Students’ Academic Records |                   |
| (2)    | Students (20)  
   (8/6/6) | Focus Groups | 2. What are the students’ perceptions of the potential of the digital games to enhance their EFL learning?  
   3. What are students’ perceptions of the effect of digital games on their EFL learning? |

3.4 Quantitative study

3.4.1 Aim and research questions

The purpose of the quantitative section of this study was to investigate the relationship of playing digital games on EFL learners at a Saudi Arabian English learning tertiary institution.

The main research question and the associated sub-questions were as follows:

1. To what extent does playing digital games relate to students’ language achievement (SLA) in English for tertiary students?

   Sub-questions:
   a) How do students’ patterns of playing digital games relate to students’ language achievement?
   b) How does the type of digital games played relate to students’ language achievement?
c) How does engaging in online social interaction in English whilst playing digital games relate to students’ language achievement?

2. What are the students’ perceptions of the potential of the digital games to enhance their EFL learning?

3.4.2 Participants

This section presents the process of recruiting participants and detailed description of participant demographics.

The students participating in this study were between the age of 18–23. They were invited to volunteer for the study and encouraged by their teachers as well. The target study sample were levels one, two, three, and four (preparatory, elementary, intermediate, and advanced) EFL students at the ELC. The rationale behind choosing preparatory, elementary, intermediate and advanced level was that students have some experience as EFL learners and spent two to three quarters (more than a semester) studying general English skills, which allowed them to acquire the basics of the language and become, to some extent, competent. In addition, students in the four assigned levels had not finished their language studies and were not considered to be fully expert language learners as those who had graduated from the ELC and started their diploma degrees. Table 3.3 below shows details of participants in the quantitative section.

Table 3.3 Number of participants who completed the questionnaire across different levels.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Number of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Questionnaires</td>
<td></td>
</tr>
<tr>
<td>Total = 379</td>
<td></td>
</tr>
<tr>
<td>Prep. Level = 144</td>
<td></td>
</tr>
<tr>
<td>Elem. Level = 83</td>
<td></td>
</tr>
<tr>
<td>Inter. Level = 125</td>
<td></td>
</tr>
<tr>
<td>Adv. Level = 27</td>
<td></td>
</tr>
</tbody>
</table>

The total number of participants was 379 students. The distribution of the students was as follows: 144 Preparatory / 83 Elementary / 125 Intermediate / 27 Advanced students in the first stage of the study (Table 3.3). The variation in students’ numbers was due to the enrolment and placement of students in that semester and the number of students who agreed to participate.
3.4.3 Methods of quantitative data collection

This section presents the methods used to collect quantitative data for the study, which mainly included a purposefully designed questionnaire for students.

3.4.3.1 Purposefully designed questionnaire.

A purposefully designed questionnaire was the first method of data collection employed in this study. The questionnaire was distributed among 379 ELC students from cohorts of levels one, two, three and four (preparatory, elementary, intermediate and advanced). The questionnaire was designed and uploaded online, engaging technology to complete the online questionnaires allowed participants to remain longer on the task than a paper-and-pencil method. It also decreased the feeling of fatigue and boredom and minimises missing data (Milne, Fraser, & Chow, 2017). Students completed the questionnaire under the researcher’s supervision who was therefore available to answer any questions or comments that might arise. Supervised or proctored surveys have many advantages especially when distributing them among adult students. According to Musallam, Schallert and Kim (2011), supervised survey sessions could significantly reduce “the possibility of faked responses, of skipping responses, of repeat or mischievous responders, of unsolicited responders, and of lower diligence and attention to the survey” which will minimise “attrition rates and the need for costly and time-consuming data cleaning” (p.1920).

The questionnaire explored three aspects in students’ relationship with digital games: (1) patterns of playing digital games, (2) type of digital games they usually play and (3) the amount of social interaction occurring during gaming. These three aspects form the main three independent variables of the questionnaire. Two other components constituted the dependent variable of the study which was Students’ Language Achievement (SLA). Two sources of data contribute to an overall understanding of students’ English language achievement and progression: 1) Students’ final cumulative overall grades in all English courses as well as the breakdown of sub-grades for the English courses; 2) Students’ repetition record (failing to pass one or more courses) during their ELC study. The final grade was a cumulative score of students’ quizzes, exams, and assignments throughout an entire semester in five different English courses (reading, writing, listening, speaking, grammar). Therefore, the final grade was used as an indication of a student’s overall performance in a semester-long period across five different English skills, while grades breakdown was the final score of students’ quizzes, exams, and assignments in one specific course.
of the five English courses. The second component of SLA, students’ repetition rate, aimed to signal whether a student had failed to reach a passing grade (60 out of 100) in one or more courses. As failing one course or more led to repetition of the whole current English level, this was considered to be a lower level of SLA in this study. The ELC administration provided the researcher with the students’ official academic records a few weeks after the end of the academic semester. All participating students were notified and agreed to the use of their academic records for the purpose of this study.

The questionnaire comprises five sections shown in Table 3.4 below:

Table 3.4 Questionnaire sections.

<table>
<thead>
<tr>
<th>Section</th>
<th>Part</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics and students’ language achievement:</td>
<td>a) Name</td>
</tr>
<tr>
<td></td>
<td>b) Age</td>
</tr>
<tr>
<td></td>
<td>c) Current English language level</td>
</tr>
<tr>
<td></td>
<td>d) Students’ repetition record</td>
</tr>
<tr>
<td></td>
<td>e) Students’ final grades</td>
</tr>
<tr>
<td>Students’ patterns of playing digital games.</td>
<td>a) Expert – novice gamers (years of play)</td>
</tr>
<tr>
<td></td>
<td>b) Experienced – non-experienced gamers (amount of play in a week)</td>
</tr>
<tr>
<td></td>
<td>c) Heavy – moderate – light gamers (playing hours per-day)</td>
</tr>
<tr>
<td>Type of digital games.</td>
<td>a) Games rich in English language.</td>
</tr>
<tr>
<td></td>
<td>b) Games moderate in English language.</td>
</tr>
<tr>
<td></td>
<td>c) Games low in English language.</td>
</tr>
<tr>
<td>Amount of social interaction during playing online digital games.</td>
<td>a) High interaction.</td>
</tr>
<tr>
<td></td>
<td>b) Moderate interaction.</td>
</tr>
<tr>
<td></td>
<td>c) Low interaction.</td>
</tr>
<tr>
<td>Students’ perceptions of digital games in their ELL.</td>
<td>a) Games and learning.</td>
</tr>
<tr>
<td></td>
<td>b) Interests.</td>
</tr>
<tr>
<td></td>
<td>c) Skills</td>
</tr>
</tbody>
</table>

These sections are aligned with the research questions of the study.
The first section, demographics, covered students’ name, age, current language level, and their language level at the beginning of their studies. After receiving the students’ academic records, the researcher added each student’s overall final grade, grades breakdown per course (Writing, Reading, Grammar, Speaking and Listening), and repetition records to the demographic section.

The second section referred to students’ patterns of playing digital games and it aimed to identify the time they spend playing digital games and their experience as gamers. The frequency of playing digital games was based on the study of Jansz and Martens (2005) and Frasson, Liu and Dufresne (2018) who suggested that gamers can be divided into three types in relation to frequency of playing: ‘heavy’, ‘moderate’ and ‘light’ gamers. ‘Heavy gamers’ were those who spent more than 2.5 hours a day in front of their screens playing digital games. The second type was ‘moderate gamers’ who spent between 1 to 2.5 hours a day playing digital games. The third type of gamers was ‘light gamers’ who spent less than one hour a day playing digital games. The next part of this section identified the students as experienced or non-experienced gamers based on the study of Enochsson et al. (2004). Experienced gamers were those who played digital games daily or almost every day in a normal week, while non-experienced gamers were those who either never played digital games or played occasionally (Enochsson et al. 2004; Smith & Du'Mont, 2009). The last part of this section identified how many years that participants had been playing digital games. This part aimed to categorise participants as expert or novice gamers according to the number of years they had been playing. Questions in this section were based on two studies (Rogers & Johnson, 2016; Rau, Peng & Yang, 2006). Students’ pattern of play was also an independent variable as the hours of play per day during weekdays and weekends, number of days played during a normal week, and years of experience as a gamer.

The third section aimed to indicate the type of digital games that students usually play. According to Aburahmah, Al RAWI, Izz and Syed (2016) and Rogers and Johnson (2016), games were classified into nine types. The types were as follows: a) adventure games, b) simulation games, c) role playing games (RPG) – these three types of games were considered as rich language games where gamers are required to have sufficient language skills to complete tasks in the games. Other type of games such as d) fighting, e) first person shooter (FPS), and f) design/art games were considered as moderate language games as they required gamers to have some language skills. The last types of games were g) race car games, h) sports games, and i) puzzle games, these games
require either minimum or no language skills. Categorisation of the games according to the use and exposure to the English language was also based upon other studies discussed in the literature review chapter (Bronstring, 2012; Cornillie, et. al., 2012; Whittaker, 2013; Chik, 2014; Sylvén & Sundqvist, 2012; Gee, 2012; Gerber & Price, 2011; Harper, 2013; Whitton, 2009). Students were asked to identify the types of digital games they usually played in relation to language, whether these games mostly include rich, moderate or low use of English language (multiple selection was available). Students were provided with examples of games from different genres for each of the three types (rich, moderate, and low in language).

The fourth section of the questionnaire aimed to investigate learners’ engagement in online interaction in relation to digital games. Studies have demonstrated that students engage in a lot of interaction during playing digital games and that social interaction establishes firm learning techniques and habits (Hoy, 2011). Berns, Gonzalez-Pardo and Camacho (2011) argue that online interaction provides authentic opportunities for gamers/students to learn from each other and receive real-time feedback. Therefore, students were asked to rate on a Likert scale (from 1–5) their online interaction with others in English while playing digital games either by speaking, reading, listening, or writing. They were also asked to rate if they always, mostly, sometimes, rarely, or never interact with other gamers in English and whether it is an oral or written interaction. The questions in this section were informed by the abovementioned studies of Hoy (2011) and Berns, Gonzalez-Pardo and Camacho (2011).

The fifth section of the questionnaire was designed to investigate students’ perceptions about the relationship between digital game playing and English language learning as well as students’ motivation to play digital games and their motivation to learn English as a second language. This section primarily served to capture students’ opinions and perceptions on the effect of digital games on their own English language learning. In addition, students specified which type of language skills (speaking, listening, reading, writing, grammar) or other skills (gaming, problem-solving, social) they learn from playing these games. Students rated several statements on a Likert scale (from 1–5) to indicate their perceptions of the abovementioned matters. Most of the questions in this section were derived from relevant studies that aim to test students’ perception toward the effect of digital games on their English language learning in general (Hoy, 2011; Ranalli, 2008; Aburahmah et al., 2016; Rogers & Johnson, 2016) and on students’ vocabulary learning (Vahdat & Behbahani, 2013). In addition, question 9 in the questionnaire considered
being in an English-speaking country as an aspect of motivation toward EFL learning. It is believed that being in an English-speaking country immerses EFL learners in the culture of the target language, which allows them to improve their EFL learning. According to Arnold and Fonseca-Mora (2015), “cultural encounters enjoyed by learners” during studying in native-speaking countries “may shape their attitude and help to sustain motivation for language learning” (p. 7).

Validation of the questionnaire design was sought prior to the data collection stage through two main tests of the questionnaire’s quality, (1) face validation and (2) a pilot study test (Saris & Gallhofer, 2007; Yin, 2013). Firstly, the Statistical Consulting Services (SCS) at The University of Wollongong was consulted to verify the questionnaire’s questions. Secondly, the questionnaire was sent to three EFL teachers who teach students from the same background and age range as the participants to give feedback on the content of the questionnaire. The three EFL teachers were qualified researchers who hold PhD degrees in the field of English Education. Finally, the final draft of the questionnaire was distributed among 20 ESL students (who study in Wollongong) for a pilot study test. Students in the pilot study were from the same background and age as the targeted population. Feedback from the face validation and the pilot were mostly in regards to (1) explaining some acronyms, (2) adding explanations for participants prior to each part of the questionnaire, (3) using the same format of questions for consistency purposes, and (4) suggestions for more accurate translations of some expressions. At the end, all feedback was taken into consideration and modifications were made to the final draft of the questionnaire (See Appendix A for questionnaire).

### 3.4.4 Questionnaire data collection procedure

The questionnaire was designed to be completed online (Google Docs) for easier collection, completion, and data exporting. Therefore, questionnaire collection took place during lab sessions. ELC administration provided the researcher with all classroom timetables and teachers and sent an email to all teachers to expect an email from the researcher regarding taking one or more lab sessions for research purposes. After designating sessions for data collection, the researcher sent emails to targeted teachers about the date and time of lab session needed for data collection. In the first few weeks, questionnaire data collection ran smoothly, until midterm when some modifications needed to be done due to teachers’ requests. After approximately 10 weeks, the researcher entered approx. 17 classes between levels one and four with an approximate number of
24 students in each class and collected data from 379 students. More than 100 students agreed to participate in focus group interviews (stage two).

The researcher highlighted lab sessions only to attend due to students’ access to PCs connected to the Internet. Permission was sought from teachers one day before entering classrooms (labs). The online questionnaire started with the consent form page where students can agree or disagree to participate by filling out the questionnaire, and to agree or disagree to participate in focus groups. In the semester of data collection, the number of classes/groups in each level were as follows: Preparatory (level one) 10 classes, Elementary (level two) 4 classes, Intermediate (level three) 8 classes, Advanced (level four) 1 class. Therefore, the researcher decided to randomly assign six classes from levels one and three, and all classes in levels two and four, due to the low number of classes in these two levels.

The researcher attended at the start of class time, gave a brief introduction and reminder of the study, then the projector provided students with a short website link of the online questionnaire. Mostly, students were excited to complete the questionnaire and a number of them were keen to attend the focus group session because they were gamers and they wanted to discuss and talk about their favourite subject. The overall time needed for questionnaire data collection was around 10 weeks with an average of 15–20 minutes for students to complete their questionnaires. After that, questionnaire data was downloaded as an Excel file, translated by the researcher into English and then exported as an SPSS file for later data cleaning, organizing, and analysis. After the end of semester, the researcher received students’ records from the ELC administration. Then all students; (1) final grades, (2) grades breakdown, and (3) repetition record were added to the SPSS file as parts of the dependent variable.

3.4.5 Methods of data analysis
All data was organised using SPSS and Excel questionnaire files were saved in an online storage application (Dropbox) and also in an external driver for backup purposes. In addition, all data files were recorded and securely saved to ensure validity, accuracy and reliability of the data and research. Both quantitative and qualitative data were analysed by CAQDA programs (computer-aided qualitative/quantitative data analysis) (Flick, 2002, p. 250). Quantitative data were analysed by Statistical Package for Social Sciences SPSS (version 24) (Gall et al., 2003) to answer the study questions.
3.4.5.1 Procedures for quantitative data analysis.
The SPSS package was used to conduct quantitative data analysis (Gall et al., 2003). The University of Wollongong Statistical Consulting Services (SCS) was consulted on the final draft of the questionnaire and the methods of its analysis.

First, descriptive statistics were calculated to provide a detailed description of the overall sample. Second, Pearson's Chi Square test (Burns, 2000) was used to test for relationships amongst independent and dependent variables which were categorical. In addition, One-way ANOVA and T-test were used to test for relationships amongst dependent variables which were categorical and nominal independent variables (grades). This allowed the researcher to assess whether the association seen between the variables in a particular sample was likely to represent an actual relationship between those variables in the population. Next, a descriptive account of statistics was performed on the last part of the questionnaire which aimed to capture students’ perceptions about digital games and language learning. A more refined statistical description was also conducted to specifically capture the perceptions of students who were considered as higher achievers in regard to their SLA. The later statistical description aimed to particularly compare the higher achievers’ perceptions to the perceptions of the remaining sample of students regarding digital games and language learning.

3.5 Qualitative study
3.5.1 Aim and research questions
The purpose of the qualitative part of this study was to investigate the perceptions of EFL students regarding digital games and English language learning.

This part addressed the second and third central research questions of the study, as follows:

2. What are the students’ perceptions of the potential of the digital games to enhance their EFL learning?
3. What are students’ perceptions of the effect of digital games on their EFL learning?
3.5.2 Participants

Participants in this part of the study were EFL students in the ELC at IPA. This section presents a detailed description of students who participated in the qualitative study in addition to the process of recruiting these participants.

The researcher conducted three focus group sessions with 20 students who were invited to volunteer to deeply explore their perceptions about digital games and English language learning. The focus group participants were randomly selected from the pool of students who previously agreed to take part in this stage. However, in each focus group session, students were selected from the same classroom to ensure convenience for their timetable, and to encourage them to participate in a comfortable setting among their classmates. Demographic data of focus group participants is explained in Table 3.5.

Table 3.5 Number of participants who participated in focus groups across different levels.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Number of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Focus Groups</td>
<td>Total = 20</td>
</tr>
<tr>
<td></td>
<td>Prep. Level = 8</td>
</tr>
<tr>
<td></td>
<td>Elem. Level = 6</td>
</tr>
<tr>
<td></td>
<td>Inter. + Adv. Level = 6</td>
</tr>
</tbody>
</table>

3.5.2.1 Participants recruitment.

Eight students from level one, six students from level two, and six students from level three were randomly assigned to participate in three focus group sessions. Emails were sent to participants about focus groups times and place (which was an office allocated by the ELC administration for the researcher for the purpose of his research). The total process of sorting, organising, and conducting all three focus group sessions took about three weeks.

3.5.3 Methods of data collection

This section presents the methods of qualitative data collection in this study.
3.5.3.1 Student focus groups.

The researcher conducted three focus-group sessions with students from each level separately (See Appendix B for focus group questions). The researcher invited approximately seven students from each level (levels 1, 2, and 3) to volunteer to be interviewed. The aim of this method of data collection was to explore students’ experiences and perceptions of the effect of digital games on their language learning. Choosing focus groups as a method to collect students’ perceptions was valid because talking in groups will encourage students to ask questions, exchange stories, and comment on each other’s experiences. In addition, the focus groups method was useful for discussing what people know and experience. It can also be used to explore what and how people think, and why they think that way (Kitzinger, 1995).

3.5.4 Qualitative data collection procedures

3.5.4.1 Focus groups data collection procedure.

Approximately 100 students agreed to participate, and the researcher had special requests from some students/gamers to be selected to attend these sessions. After the end of the questionnaire data collection stage, the researcher had a list of students who agreed to participate in the focus group sessions. Then, a separate list of these students was created for each level (1, 2, 3, 4). The researcher randomly chose 8 students from one class in level one, 6 students from one class in level two, and 6 students from one class in level three with 2 backup students for each session in case of absence or change of situation. The researcher took into consideration students’ special requests to participate and allowed the selection of 1–2 students in each session from those who personally requested to attend.

As explained earlier students were selected from the same classroom to ensure convenience in their timetable, and to encourage them to participate in a comfortable setting among their classmates. Therefore, all focus group sessions took place during students’ break time. After selecting students for the focus groups, an email was sent to students about the time and place to meet. Almost all students from the three focus group sessions attended; only two students couldn’t come and were substituted by the next students on the list. Prior to the start of each focus group session, students were notified that their information and what they said during the session will be audio-recorded for the purpose of data analysis and will not be revealed to anyone else other than the researcher. Focus group sessions ran smoothly and were audiotaped on an iPhone and sent
immediately to the researcher’s email and data storage drive. Each focus group session took about 20–30 minutes. At the start of each focus group session, participants told their first names, and in the transcription process each participant was assigned with a number (e.g. P1, P2 etc.). The researcher asked questions and gave participants time to answer, discuss, elaborate, and contradict. The three focus group sessions were conducted in Arabic – the students’ first language. After the end of all focus group sessions, the researcher transcribed and translated them into English to prepare for data analysis.

3.5.5 Methods of data analysis

All of the digital audio files for the focus groups were saved in an online storage application (Dropbox) and also in an external drive for backup purposes. In addition, all data files were recorded and securely saved to ensure validity, accuracy and reliability of the data and research. Both quantitative and qualitative data were analysed by CAQDA programs (computer-aided qualitative/quantitative data analysis) (Flick, 2002, p. 250). Qualitative data (focus groups) were analysed via NVivo software (version 11) (Creswell, 2013).

3.5.5.1 Procedures for qualitative data analysis.

After transcribing all students’ focus groups, and once quantitative data analysis was completed, qualitative data analysis was set to commence. First, analysis of students’ perceptions in relation to the answers of focus groups questions was conducted. Then, a thematic analysis approach was adopted to analyse additional emerging themes in focus groups data (Guest, MacQueen & Namey, 2011). Thematic analysis allowed the researcher to identify and analyse meaningful patterns in the collected data (Braun & Clarke, 2006). All qualitative data was read thoroughly, and codes were characterised in the light of the research questions and the questions asked in the focus groups. The theoretical frameworks in reference to language learning and gaming guided the identification and organisation of themes and topics. The process of data analysis was facilitated by a computer-supported qualitative data analysis software NVivo (Version 11). This program assists in storing, organising, coding and revising the data gathered from the study including students’ focus groups (Creswell, 2012). The first stage of the focus groups data analysis started by inserting the transcripts of answers of focus group questions into NVivo software. Then NVivo assisted coding was conducted to identify common themes across all the three groups’ answers to questions which
were asked at the focus groups interview sessions. Similar ideas and responses that were mentioned by different participants across the three focus group sessions were coded and collected under separate nodes (for example, the subtitle feature in digital games and the exposure to various English accents and dialects). The coding was discussed with supervisors and based on the coding the main themes were identified. These included: 1) digital games as EFL learning tool; 2) English language as a tool for playing digital games; 3) online interaction games and listening, speaking and writing English skills; 4) rich in language digital games and English reading skill; 5) the impact of digital games on motivation in EFL learning; 6) learning in a safe environment; and 7) exposure to various versions of English expressions and accents. The use of NVivo allowed to facilitate organising and approaching the qualitative data to gain an in-depth comprehension of participants’ perceptions, thus, conducting thematic analysis by identifying the study’s main themes and patterns.

3.6 Ethical considerations

Ethics application for this research was approved by the human research and ethics committee at the University of Wollongong (approval number 2016/949). The Director of the ELC at the IPA in Riyadh, Saudi Arabia, gave his permission to conduct the research.

3.6.1 Informed consent

Participants in the study signed consent forms (electronically and on paper) to allow the researcher to use their responses as part of the study. Since the questionnaire was designed online, the consent form was presented as the first page and can be signed electronically. Participants in focus groups signed paper consent forms. Information about the study and its purpose was provided to participants prior to consenting to participate (Denzin & Lincoln, 2011). Participants were informed that they could withdraw from the study at any stage. Participants were only required to answer the questions they were comfortable with and they were informed that participation in the study was completely voluntary. Consent forms are attached as appendices D and E.
3.6.2 Confidentiality

The participants in the study were notified that their identities will only be disclosed to the researcher and will not be revealed at any stage. For the questionnaire data, participants were assigned in sequenced numbers from 1 to 379 that were associated to their names during data collection. To maintain confidentiality of participants, pseudonyms (P1, P2 etc.) were used by the researcher to represent the participants in the focus groups (Christians, 2000).

3.6.3 Language concerns

Student questionnaires and focus groups were conducted in Arabic to ensure that the students were able to fully understand the questions and express their views and perceptions. The questionnaire and focus group questions were translated by the researcher who is a professional translator.

3.7 Conclusion

This chapter provided a detailed description of the study methodology, research process and theoretical framework. The chapter started with discussing the theoretical and conceptual framework that informed this study. Then, an explicit description of the research context was provided. As the study employed a mixed methods design, each method was described separately. A comprehensive description of the quantitative study was followed by a comprehensive description of the qualitative study. Finally, the chapter ended with an account of the study’s ethical considerations.

In the next chapter, results and discussion of the correlational analysis in relation to the study variables will be presented. The chapter will focus on presenting the results of the statistical analysis tests between the dependent and three independent variables discussed earlier in this chapter. Therefore, the first part of the chapter will be allocated to the results of students’ pattern of playing digital games and SLA. Next, the results of types of games and SLA will be presented. After that, the results of the relationship between online social interaction and SLA will be offered. Finally, the chapter will end with a detailed discussion of the findings of the correlational analyses.
CHAPTER 4: CORRELATIONAL ANALYSIS: RESULTS AND DISCUSSION

The aim of this research study was to determine the relationship between playing digital games and students’ language learning achievement based on their grades and repetition records. In addition, the study aimed to explore ESL learners’ perceptions about the effect of digital games on language learning achievements and the possibility of using digital games as an English teaching tool. This chapter aims to present the results that answered the first main research question of the study and its related sub-questions:

1. To what extent does playing digital games relate to students’ language achievement (SLA) in English for tertiary students?
   
   Sub-questions:
   
   a) How do students’ patterns of playing digital games relate to students’ language achievement?
   
   b) How does the type of digital games played relate to students’ language achievement?
   
   c) How does engaging in online social interaction in English whilst playing digital games relate to students’ language achievement?

   In this chapter, the results and discussion of correlational analysis of the study are presented. The correlational analysis results will be presented first, followed by the discussion section.

   The correlational analysis results start with the general descriptive data of the targeted sample. Then, the correlational analysis results are presented. The dependent and independent variables were analysed using SPSS and the statistical techniques included T-test, Chi-square, and ANOVA tests throughout data analysis. As explained in Chapter 3, the dependent variable was Students’ Language Achievement (SLA) and the three independent variables were digital gaming patterns (amount of time playing), type of digital games in regard to language exposure, and the amount of social interaction during online digital gaming.
4.1 Results of correlational data analysis

4.1.1 Students language achievement (dependent variable)

As explained in the methodology chapter, the dependent variable in this study is Students’ Language Achievement (SLA), which was captured through the two components of students’ total final grades of the five English courses altogether, breakdown of final grades for each specific English course (reading, writing, speaking, listening, and grammar), and students’ repetition record which was defined as failing to pass one or more courses.

The questionnaire was completed by 379 participants (students). Participants’ grades and repetitions record were added to each participant at the end of the semester when grades became available. Therefore, participants with complete entered data (N=379) who initially completed the questionnaire at the beginning of the semester were included in all statistical tests in the study.

4.1.1.1 Students’ grades.

Total final grades for students ranged from 22 to 96 out of 100 which showed that grades were following a normal curve. The mean grade for the 379 participants was 68.73 as presented in Figure 4.1.

44.8% of participants scored 69 or less, and 30.9% of participants scored between 70 and 79. Only 19.3% of participants scored 80 or above.

![Figure 4.1 Total final grades range, mean, and standard deviation.](image)
4.1.1.2 *Student’s language levels.*

Participants were divided into four levels as a result of a mandatory placement test. There were 144 students in level one (Preparatory), 83 in level two (Elementary), 125 in level three (Intermediate), and 27 in level four (Advanced) as presented in Table 4.1.

4.1.1.3 *Students repetition record.*

Of the 379 participants there were 115 students who had repeated (failed to pass) one or more English courses. The other 264 students in the study hadn’t repeated any English courses.

Table 4.1 General descriptive data.

<table>
<thead>
<tr>
<th>Language Level</th>
<th>Number of Students</th>
<th>Mean Final Grades</th>
<th>Repetition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparatory (One)</td>
<td>144</td>
<td>61.58</td>
<td>77 (53%)</td>
</tr>
<tr>
<td>Elementary (Two)</td>
<td>83</td>
<td>68.92</td>
<td>15 (18%)</td>
</tr>
<tr>
<td>Intermediate (Three)</td>
<td>125</td>
<td>75.89</td>
<td>14 (11%)</td>
</tr>
<tr>
<td>Advanced (Four)</td>
<td>27</td>
<td>73.22</td>
<td>9 (33%)</td>
</tr>
<tr>
<td>Total</td>
<td>379</td>
<td>68.73</td>
<td>115 (30%)</td>
</tr>
</tbody>
</table>

4.1.2 *Gaming pattern variable (1st independent variable)*

The first independent variable investigated in this study was students’ gaming pattern. Three questions in the questionnaire were developed to determine students’ gaming pattern. One question asked how long students had been playing digital games, to assign them to groups as expert or novice gamers. These groups were formed based on the studies of Rogers and Johnson (2016) and Rau, Peng and Yang (2006). The second question asked about how many days they played in a week and then they were assigned as experienced or non-experienced gamers based on the suggestions of Enochsson et al. (2004) and Smith and Du’Mont (2009). The third question asked about the duration of their digital game playing time daily; this information was used to categorize them as heavy, moderate, or light gamers. These categories were based on the studies of Jansz and Martens (2005) and De Schutter (2010). After the formation of these groups, each students’ category was analysed against the Students’ Language Achievement (SLA) variable (more details about the development of questions is provided in Chapter 3).
The descriptive data showed that out of the 379 participants, the majority (76.3%) were students who had been playing digital games for more than four years, while 18.8% had been playing for less than four years and only 5% of students hadn’t played digital games at all, as presented in Table 4.2.

Table 4.2 Digital games playing years.

<table>
<thead>
<tr>
<th>Years of playing digital games</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I do not play digital games</td>
<td>19</td>
<td>5.0</td>
</tr>
<tr>
<td>1 year</td>
<td>8</td>
<td>2.1</td>
</tr>
<tr>
<td>2 years</td>
<td>17</td>
<td>4.5</td>
</tr>
<tr>
<td>3 years</td>
<td>20</td>
<td>5.3</td>
</tr>
<tr>
<td>4 years</td>
<td>26</td>
<td>6.9</td>
</tr>
<tr>
<td>More than 4 years</td>
<td>289</td>
<td>76.3</td>
</tr>
<tr>
<td>Total</td>
<td>379</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The 19 participants who indicated that they did not play games (selected an answer “I don’t play digital games”) were directed immediately to the last section of the questionnaire (students’ perceptions) and were not included in the correlational analyses.

The remaining participants were then asked about how many days they play digital games during a normal week. The data showed that the majority of participants play digital games daily (30.6%); participants who play 3 days (15.8%), 2 days (14.8%), and 1 day (12.4%) followed respectively as shown in Table 4.3.

Table 4.3 Days of digital games playing weekly.

<table>
<thead>
<tr>
<th>Days of playing digital games weekly</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>19</td>
<td>5.0</td>
</tr>
<tr>
<td>1 day</td>
<td>47</td>
<td>12.4</td>
</tr>
<tr>
<td>2 days</td>
<td>56</td>
<td>14.8</td>
</tr>
<tr>
<td>3 days</td>
<td>60</td>
<td>15.8</td>
</tr>
<tr>
<td>4 days</td>
<td>37</td>
<td>9.8</td>
</tr>
<tr>
<td>5 days</td>
<td>28</td>
<td>7.4</td>
</tr>
</tbody>
</table>
The final question investigating students’ patterns of play described total play hours during weekdays and on the weekends. During weekdays, the answers were spread from 0 hours to more than 5 hours. Playing digital games for 2 and 3 hours were the highest responses (23.5% and 18.7%), while playing 5 hours and more than 5 hours were the lowest (5% and 9.8%).

In comparison, students’ patterns of play during weekends were slightly different. As expected, students played for more hours during weekends than on weekdays. Therefore, the numbers of students who played for four (13.5%), five (7.9%), and more than five hours (23.5%) had increased as presented in Table 4.4.

<table>
<thead>
<tr>
<th>Playing hours</th>
<th>during weekdays</th>
<th>during weekends</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>Valid 0 hours</td>
<td>61</td>
<td>16.1</td>
</tr>
<tr>
<td>1 hour</td>
<td>58</td>
<td>15.3</td>
</tr>
<tr>
<td>2 hours</td>
<td>89</td>
<td>23.5</td>
</tr>
<tr>
<td>3 hours</td>
<td>71</td>
<td>18.7</td>
</tr>
<tr>
<td>4 hours</td>
<td>44</td>
<td>11.6</td>
</tr>
<tr>
<td>5 hours</td>
<td>19</td>
<td>5.0</td>
</tr>
<tr>
<td>More than 5 hours</td>
<td>37</td>
<td>9.8</td>
</tr>
<tr>
<td>Total</td>
<td>379</td>
<td>100.0</td>
</tr>
</tbody>
</table>

4.1.2.1 Participant categories.

Based on the data and literature presented in Chapter 3, all the participants/gamers were categorized according to their pattern of playing digital games daily, weekly, and for how many years they had been playing (detailed explanation in Methodology). First of all, and according to the length of their exposure to digital games, participants were divided into two groups: (1) expert gamers who have been playing digital games for more than 4 years, and (2) novice gamers who
have been playing digital games for less than 4 years. The results showed that 23% of participants were considered novice gamers while 76% were expert gamers as shown in Table 4.5.

Table 4.5 Expert and novice gamers (years).

<table>
<thead>
<tr>
<th>Years of play</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid Novice</td>
<td>90</td>
<td>23.7</td>
</tr>
<tr>
<td>Expert</td>
<td>289</td>
<td>76.3</td>
</tr>
<tr>
<td>Total</td>
<td>379</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The second categorisation described gamers as experienced or non-experienced gamers according to how many days they play during a normal week. Those who played for three days a week or more were considered experienced while who played two days or less were considered to be non-experienced. Results showed that the percentage is slightly different from “years of experience” as presented in Table 4.6.

Table 4.6 Experienced and non-experienced gamers (days a week).

<table>
<thead>
<tr>
<th>Play days in a week</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid Non-experienced</td>
<td>122</td>
<td>32.2</td>
</tr>
<tr>
<td>Experienced</td>
<td>257</td>
<td>67.8</td>
</tr>
<tr>
<td>Total</td>
<td>379</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The final categorisation of participants according to their pattern of play included “heavy gamers”, “moderate gamers”, and “light gamers”. The categorisation was based on participants’ hours of digital games playing during weekdays and weekends. As mentioned in Chapter 3, participants who played 0–1 hour were considered to be light gamers, participants who played for two hours were considered to be moderate gamers, and participants who played for three hours and more were considered to be heavy gamers. During weekdays, the results showed that 45.1% played digital games heavily (3 hours or more), 23.5% play moderately (2 hours), and 31.4% play lightly (0–1 hour). As expected, during weekends the number of light and moderate gamers
decreased to 25.6% and 14.2% while the heavy gamers group increased to reach 60.2%. These results are presented in Table 4.7.

Table 4.7 Heavy, moderate, light gamers in weekdays and weekends.

<table>
<thead>
<tr>
<th>Gaming pattern</th>
<th>(weekdays)</th>
<th>(weekends)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>Valid Light</td>
<td>119</td>
<td>31.4</td>
</tr>
<tr>
<td>Moderate</td>
<td>89</td>
<td>23.5</td>
</tr>
<tr>
<td>Heavy</td>
<td>171</td>
<td>45.1</td>
</tr>
<tr>
<td>Total</td>
<td>379</td>
<td>100.0</td>
</tr>
</tbody>
</table>

4.1.2.2 Statistical analysis tests.

The first independent variable examined the relationships between gaming pattern and the dependent variable in this study, students’ language achievement (SLA); this relationship was analysed using T-test, Chi-square, and ANOVA tests. The dependent variable was tested against all of the abovementioned students’ categories to consider if there was any relationship between SLA and playing digital games for different years, days or hours. As explained earlier, SLA is a twofold variable that consists of (A) students’ grades, and (B) repetition records.

A. Years of play vs grades.

Firstly, students’ years of playing digital games was tested against each component of the SLA. T-tests showed that students who indicated they played for more than 4 years and were categorised as expert gamers (M=70.0, SD=12.1, n=289) had significantly higher language achievement regarding total final grades (p value < 0.05) than students who indicated they play less than 4 years and were categorised as novice gamers (M=64.6, SD=15.5, n=90, t(377)=3.44, p=.001) as shown in Tables 4.8 and 4.9 and Figure 4.2.

Table 4.8 Expert and novice gamers final grades statistics.

<table>
<thead>
<tr>
<th>Group Statistics</th>
<th>Std.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years of play</td>
<td>N</td>
</tr>
<tr>
<td>Total final grades</td>
<td>Novice</td>
</tr>
<tr>
<td></td>
<td>Expert</td>
</tr>
</tbody>
</table>
Table 4.9 Expert and novice gamers final grades T-test.

<table>
<thead>
<tr>
<th></th>
<th>Sig. (2-tailed)</th>
<th>Mean Difference</th>
<th>Std. Error Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total final grades</td>
<td>Equal variances assumed</td>
<td>***.001</td>
<td>-5.406</td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td>**.003</td>
<td>-5.065</td>
</tr>
</tbody>
</table>

* p < .05, ** p < .01, *** p < .001

B. Years of play vs repetitions.

The other SLA component was students’ repetition record. Students were grouped into two groups: (1) students who had repeated one level or more, and (2) students who had never repeated. A Chi-square test of independence was performed to determine whether expert (who indicated they played for more than 4 years) and novice (who indicated they played for less than 4 years) gamers had different records of repetition or not. Expert gamers were found to have a significantly lower repetition rate comparing to novice gamers (73.7% vs 56.7%, $\chi^2 (1, N=379) = 9.4$, p< .002) as presented in Tables 4.10 and 4.11 and Figure 4.3.
Table 4.10 Expert and novice gamers repetition cross-tabs.

<table>
<thead>
<tr>
<th>Years of play</th>
<th>Novice</th>
<th>Expert</th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Count</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>51</td>
<td>39</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>% within years of experience</td>
<td>56.7%</td>
<td>43.3%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>Expert</td>
<td>Count</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>213</td>
<td>76</td>
<td>289</td>
<td></td>
</tr>
<tr>
<td>% within years of experience</td>
<td>73.7%</td>
<td>26.3%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>264</td>
<td>115</td>
<td>379</td>
<td></td>
</tr>
<tr>
<td>% within years of experience</td>
<td>69.7%</td>
<td>30.3%</td>
<td>100.0%</td>
<td></td>
</tr>
</tbody>
</table>

Figure 4.3 Expert and novice gamers repetition rate

- **Repetitions**
- **No repetitions**
Table 4.11 Expert and novice gamers repetitions Chi-square tests.

<table>
<thead>
<tr>
<th>Chi-square tests</th>
<th>Value</th>
<th>df</th>
<th>Asymptotic Significance (2-sided)</th>
<th>Exact Sig. (2-sided)</th>
<th>Exact Sig. (1-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-square</td>
<td>9.423</td>
<td>1</td>
<td>**.002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuity Correction</td>
<td>8.634</td>
<td>1</td>
<td>.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>9.043</td>
<td>1</td>
<td>.002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fisher's Exact Test</td>
<td></td>
<td></td>
<td>.004</td>
<td>.002</td>
<td></td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>9.398</td>
<td>1</td>
<td>.002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>379</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p < .05, ** p < .01, *** p < .001

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 27.31.
b. Computed only for a 2x2 table

C. Days of play a week vs SLA.

Students were categorised as experienced and non-experienced gamers also according to their number of playing days in a normal week. However, all performed tests (T-test for grades and Chi-square for repetition) did not show any significant difference between the two groups’ SLA. Tables of statistically insignificant tests can be found in Appendix F.

D. Hours of play vs SLA.

The last categorisation of students in the first variable (patterns of play) related to the amount of time (hourly) they played during weekdays and weekends. Students were divided into heavy, moderate, and light gamers (H/M/L) based on the number of hours they played digital games; however, all results did not reach significance. Tables of statistically insignificant results can be found in Appendix F.

This section of the correlational analysis results chapter outlined all results in regard to the first independent variable (gaming pattern). The gaming pattern variable was tested against the two components of the dependent variable (SLA). Results showed that the only significant results found in the gaming pattern was in students’ years of play, in favour of expert gamers (who
indicated they play for more than 4 years) in the two components of SLA (final grades and repetitions).

In the next section, statistical test results of SLA and the second independent variable, the type of games played, will be presented.

4.1.3 Type of games variable (2nd independent variable)

The second independent variable discussed in this study was the type of digital games played by students. As explained in the methodology chapter, one question in the questionnaire assessed the type of games that students usually played. This question asked students directly to identify whether the games they mostly played included rich, moderate or low use of English. Students were given examples of each choice of game types as well as examples of specific games in that type. Students also were allowed to select one, two, or all of the three types of games either rich in language, moderate in language or low in language.

The 19 participants who indicated that they did not play digital games in the previous questions were excluded from this analysis. The data showed that out of the 360 remaining participants who played digital games, 144 played games that were rich in language, 147 played games that were moderate in English language, and 69 played games that require low English language use, as presented in Table 4.12.

Table 4.12 Type of played games: Rich, Moderate, Low in language.

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid Rich</td>
<td>144</td>
<td>38.0</td>
</tr>
<tr>
<td>Moderate</td>
<td>147</td>
<td>38.8</td>
</tr>
<tr>
<td>Low</td>
<td>69</td>
<td>18.2</td>
</tr>
<tr>
<td>Total</td>
<td>360</td>
<td>95.0</td>
</tr>
</tbody>
</table>

Participants were then divided into six groups according to their answers for more specific analysis: 1) those who play rich in language games only, 2) those who play rich and moderate in language games, 3) those who play moderate in language games only, 4) those who play moderate and low in language games, 5) those who play low in language games only, 6) and finally those who play all types of games. Descriptive statistics of the six groups are presented in Table 4.13.
Table 4.13 Type of played games regarding language use (new grouping).

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rich</td>
<td>73</td>
<td>19.3</td>
</tr>
<tr>
<td>Rich &amp; Moderate</td>
<td>50</td>
<td>13.2</td>
</tr>
<tr>
<td>Moderate</td>
<td>147</td>
<td>38.8</td>
</tr>
<tr>
<td>Moderate &amp; Low</td>
<td>16</td>
<td>4.2</td>
</tr>
<tr>
<td>Low</td>
<td>53</td>
<td>14.0</td>
</tr>
<tr>
<td>All</td>
<td>21</td>
<td>5.5</td>
</tr>
<tr>
<td>Total</td>
<td>360</td>
<td>95.0</td>
</tr>
</tbody>
</table>

4.1.3.1 Statistical analysis tests.

A. Separate tests.

Firstly, statistical tests were performed on each group of participants separately according to the type of games they played. The first statistical analysis in the second variable section (type of played games) was to test the SLA of participants who play rich in language games and those who don’t play rich in language games. A T-test was performed between the two groups and the results showed that participants who play rich in language games (M=70.9, SD=12.4, n=144) had significantly higher language achievement in regards to their final grades (p value <0.05) than those who don’t play rich in language games (M=66.9, SD=13.5, n=216, t(358)=2.90, p=0.004) as shown in Tables 4.14 and 4.15 and Figure 4.4.

Table 4.14 Final grades statistics of players and non-players of rich in language games.

<table>
<thead>
<tr>
<th>Games that are rich in English language</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total final grades</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Play</td>
<td>144</td>
<td>70.99</td>
<td>12.435</td>
</tr>
<tr>
<td>Don't play</td>
<td>216</td>
<td>66.90</td>
<td>13.536</td>
</tr>
</tbody>
</table>
Table 4.15 Final grades T-test of players and non-players of rich in language games.

<table>
<thead>
<tr>
<th></th>
<th>t-test for Equality of Means</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>Mean Difference</td>
<td>Std. Error Difference</td>
</tr>
<tr>
<td>Total final grades</td>
<td>Equal variances assumed</td>
<td>**.004</td>
<td>4.095</td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td>.003</td>
<td>4.095</td>
</tr>
</tbody>
</table>

* p < .05, ** p < .01, *** p < .001

There was no significant difference between participants who play rich in language games and those who don’t play rich in language games regarding the other SLA component, repetition records.

The same tests were performed on the other two groups of types of games separately; 1) participants who play moderate in language games and those who don’t play moderate in language games, 2) participants who play low in language games and those who don’t play low in language games. T-tests and Chi-square tests for all two components of SLA (grades and repetitions) did not show any significant difference between the two types of participants in the two groups.
However, T-test results between participants who play games that are low in language use and those who don’t play this type of games showed a slight difference that was approaching significance in the SLA mean of final grades. Participants who play low in language games (M=66.4, SD=13.5, n=93) had lower language achievement in regards to their final grades with a p value <0.08 than those who don’t play low in language games (M=69.3, SD=13.1, n=267, t(358)=1.79, p=0.073) as shown in Tables 4.16 and 4.17 and Figure 4.5.

Table 4.16 Final grades statistics of players and non-players of low in language games.

<table>
<thead>
<tr>
<th>Games that are low in English language</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total final grades</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Play</td>
<td>93</td>
<td>66.42</td>
<td>13.535</td>
</tr>
<tr>
<td>Don't play</td>
<td>267</td>
<td>69.27</td>
<td>13.084</td>
</tr>
</tbody>
</table>

Table 4.16 Final grades statistics of players and non-players of low in language games.

Figure 4.5 Mean total final grades statistics of players and non-players of low in language games
Table 4.17 Final grades T-test of players and non-players of low in language games.

<table>
<thead>
<tr>
<th></th>
<th>t-test for Equality of Means</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>Mean Difference</td>
<td>Std. Error Difference</td>
</tr>
<tr>
<td>Total final grades</td>
<td>Equal variances assumed</td>
<td>0.073</td>
<td>-2.854</td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td>0.079</td>
<td>-2.854</td>
</tr>
</tbody>
</table>

In addition, Chi-square test results showed a slight difference that was approaching significance between participants who play low in language games and those who don’t play low in language games in regard to their repetition record with a mean difference approaching significance $p=.08$ in favour of participants who don’t play low in language games.

**B. First combined groups test.**

The second step in analysing the data in regard to the type of games participants played was to combine participants who play all three types of games (rich, moderate, and low in language games players). Tests were performed across the three groups to find any significant difference in their SLA. An ANOVA test was performed on the three groups and the results showed that there was a statistically significant difference between the mean grades of participants who played different types of games, $F(2,36)=4.65, p=0.01$. Post hoc analyses using Tuckey’s HSD indicated that there was a significant mean difference ($p=016$) between participants who play rich in language digital games ($M=70.9$, $SD=12.4$) and participants who play low in language games ($M=65.6$, $SD=13.4$) as presented in Tables 4.18 and 4.19 and Figure 4.6. No significant difference was found between participants who play rich in language digital games and participants who play moderate in language digital games, or between participants who play moderate in language digital games and participants who play low in language digital games.
Table 4.18 Descriptive statistics of rich, moderate, and low in language games players.

### Descriptive Statistics

<table>
<thead>
<tr>
<th>Language games type</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rich</td>
<td>70.99</td>
<td>12.435</td>
<td>144</td>
</tr>
<tr>
<td>Moderate</td>
<td>67.47</td>
<td>13.591</td>
<td>147</td>
</tr>
<tr>
<td>Low</td>
<td>65.68</td>
<td>13.436</td>
<td>69</td>
</tr>
<tr>
<td>Total</td>
<td>68.54</td>
<td>13.242</td>
<td>360</td>
</tr>
</tbody>
</table>

Figure 4.6 Mean total final grades statistics of rich, moderate, and low in language games players

Table 4.19 ANOVA test results for rich, moderate, and low in language games players.

### Tests of Between-Subjects Effects

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>1598.940a</td>
<td>2</td>
<td>799.470</td>
<td>4.652</td>
<td>.010</td>
</tr>
<tr>
<td>Intercept</td>
<td>1475734.059</td>
<td>1</td>
<td>1475734.059</td>
<td>8586.759</td>
<td>.000</td>
</tr>
<tr>
<td>Language games type</td>
<td>1598.940</td>
<td>2</td>
<td>799.470</td>
<td>4.652</td>
<td>**.010</td>
</tr>
<tr>
<td>Error</td>
<td>61354.591</td>
<td>357</td>
<td>171.862</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1753945.000</td>
<td>360</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>62953.531</td>
<td>359</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p < .05, ** p < .01, *** p < .001

a. R squared = .025 (Adjusted R squared = .020)
Results showed that there was no significant difference between participants who play rich, moderate, or low in language games regarding the other SLA component (repetition records).

**C. Second combined groups test.**

The third and last step in analysing data in regard to the type of games participants play was to combine participants who play the three types of games (rich, moderate, and low in language games players) in more specified groups. In this section, participants will be divided into six groups: 1) participants who play rich in language games only, 2) participants who play rich and moderate in language games, 3) participants who play moderate in language games only, 4) participants who play moderate and low in language games, 5) participants who play low in language games only, 6) and finally participants who play all types of games.

Descriptive statistics showed that the majority of participants play moderate in language games (n=147) and the lowest groups were those who play moderate and low in language games together (n=16) and participants who play all type of games (n=21). However, a number of participants were distributed over the other three types of games, rich and moderate (n=50), low in language games only (n=53), and (n=73) play rich in language games only.

Therefore, tests were performed across the six groups to find any significant difference in their SLA. An ANOVA test was performed on the six groups and the result showed that there was a statistically significant difference between the mean grades of participants who play the six types of games (only rich, rich and moderate, only moderate, moderate and low, or only low in language games players), F(5,36)=2.64, p=0.02. Post hoc analyses using Tuckey’s HSD indicated that there was a significant mean difference between participants who play rich and moderate in language digital games together (M=72.2, SD=12.3) and participants who play low in language digital games only (M=64.4, SD=13.4) with a p=.033. In addition, post hoc analyses using Tuckey’s HSD also indicated that the mean difference was approaching significance between participants who play rich in language digital games only (M=71.1, SD=11.9) and participants who play low in language digital games only (M=64.4, SD=13.4) with a p=.055 as presented in Tables 4.20 and 4.21 and Figure 4.7.
Table 4.20 Descriptive statistics of all six types of language games players.

<table>
<thead>
<tr>
<th>Language games type</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rich</td>
<td>71.14</td>
<td>11.895</td>
<td>73</td>
</tr>
<tr>
<td>Rich &amp; Moderate</td>
<td>72.22</td>
<td>12.356</td>
<td>50</td>
</tr>
<tr>
<td>Moderate</td>
<td>67.47</td>
<td>13.591</td>
<td>147</td>
</tr>
<tr>
<td>Moderate &amp; Low</td>
<td>69.75</td>
<td>12.918</td>
<td>16</td>
</tr>
<tr>
<td>Low</td>
<td>64.45</td>
<td>13.464</td>
<td>53</td>
</tr>
<tr>
<td>All</td>
<td>67.57</td>
<td>14.358</td>
<td>21</td>
</tr>
<tr>
<td>Total</td>
<td>68.54</td>
<td>13.242</td>
<td>360</td>
</tr>
</tbody>
</table>

Figure 4.7 Mean total final grades statistics of all six types of language games players
Table 4.21 ANOVA test results of all six types of language games players.

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>2266.433*</td>
<td>5</td>
<td>453.287</td>
<td>2.644</td>
<td>.023</td>
</tr>
<tr>
<td>Intercept</td>
<td>1004430.741</td>
<td>1</td>
<td>1004430.741</td>
<td>5859.046</td>
<td>.000</td>
</tr>
<tr>
<td>Language games type</td>
<td>2266.433</td>
<td>5</td>
<td>453.287</td>
<td>2.644</td>
<td>*.023</td>
</tr>
<tr>
<td>Error</td>
<td>60687.097</td>
<td>354</td>
<td>171.432</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1753945.000</td>
<td>360</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>62953.531</td>
<td>359</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p < .05, ** p < .01, *** p < .001

a. R squared = .036 (Adjusted R squared = .022)

Results showed that there were no significant differences between the participants of all six groups of language game types relating the other SLA component (repetition records).

In conclusion, this section of the findings chapter outlined all statistical analysis results for the second independent variable (type of played games). The type of a game variable was tested against the two components of the dependent variable (SLA). The statistical results showed that there was a significant difference between students who played different type of games that offer different amounts of exposure to the English language.

The most significant difference was found in the mean final grades of SLA in favour of participants who play rich in language games and those who play rich and moderate in language games combined, compared to players of low in language games. In addition, a slight difference was also found in the other component of SLA (repetition records). The slight difference was also in favour of participants who play rich in language games and those who play rich and moderate in language games combined, compared to players of low in language games. However, this difference in the repetition record didn’t reach significance level of p value = .05.

In the next section, the results of statistical tests between SLA and the third and last independent variable, the social online interaction, will be presented.
4.1.4 Social online interaction variable (3rd independent variable)

The last independent variable discussed in this study aimed to investigate learners’ engagement in online interaction in relation to digital games. Studies have demonstrated that students engage in a lot of interaction during the playing of digital games and that social interaction helps their learning (Hoy, 2011). Berns, Gonzalez-Pardo and Camacho (2011) also argue that online interaction provides authentic opportunities for gamers/students to learn from each other and receive real-time feedback. Therefore, students were asked to rate on a Likert scale (from 1–5) their online interaction with other gamers while playing digital games either by speaking, reading, listening, or writing in English.

The data showed that out of the 360 participants who played digital games (excluding the 19 participants who indicated that they did not play digital games in the previous questions), the majority of students agreed that they read and listen to a lot of English while playing online digital games. A smaller percentage of students agreed that they wrote and spoke a lot of English while playing online.

Participants in this section were grouped into three groups in each question according to their level of online interaction. Participants who “strongly agree” and “agree” on interacting online were considered to have a “High” level of online interaction, participants who neither agree nor disagree were considered to have a “Moderate” level of online interaction, and participants who “strongly disagree” and “disagree” were considered to have a “Low” level of online interaction.

4.1.4.1 Statistical analysis tests.

In this part of the results, tests were performed between the third independent variable (level of online interaction) and SLA. In addition, the first component of SLA (final grade of all English courses) was also divided into grades breakdown for each course specifically (writing final grades, reading final grades, listening final grades and speaking final grades). The use of the grades’ breakdown allowed for more refined analyses of the data.

A. Online speaking interaction levels vs SLA.

The first statistical analysis investigating the level of online interaction variable part was to test the SLA among participants who engaged in different levels of online speaking interaction. Data
showed that 45 participants had a low level of online speaking interaction, while 111 had moderate and 204 had a high level of online speaking interaction. An ANOVA test was performed on the three groups and the result showed that there was a statistically significant difference between the mean total grades of participants who had different levels of online English speaking interaction, F(2,36)=3.43, p=0.03. Post hoc analyses using Tuckey’s HSD indicated that the mean difference was approaching significance between participants who had high level of online speaking interaction (M=70, SD=11.9) and participants who had low level of online speaking interaction (M=65.1, SD=15.7). with p=.063 as presented in Tables 4.22 and 4.23 and Figure 4.8.

Table 4.22 Descriptive statistics of all three groups of online speaking interaction levels.

<table>
<thead>
<tr>
<th>Dependent Variable: Total final grades</th>
<th>Level of online speaking interaction</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td></td>
<td>65.13</td>
<td>15.734</td>
<td>45</td>
</tr>
<tr>
<td>Moderate</td>
<td></td>
<td>67.16</td>
<td>14.065</td>
<td>111</td>
</tr>
<tr>
<td>High</td>
<td></td>
<td>70.03</td>
<td>11.975</td>
<td>204</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>68.54</td>
<td>13.242</td>
<td>360</td>
</tr>
</tbody>
</table>

Figure 4.8 Mean total final grades of students with high, moderate, and low online speaking interaction levels
Table 4.23 ANOVA test results of all three groups of online speaking levels.

Tests of Between-Subjects Effects

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>1188.490</td>
<td>2</td>
<td>594.245</td>
<td>3.435</td>
<td>.033</td>
</tr>
<tr>
<td>Intercept</td>
<td>1132956.969</td>
<td>1</td>
<td>1132956.969</td>
<td>6548.456</td>
<td>.000</td>
</tr>
<tr>
<td>Online speaking interaction</td>
<td>1188.490</td>
<td>2</td>
<td>594.245</td>
<td>3.435</td>
<td>* .033</td>
</tr>
<tr>
<td>Error</td>
<td>61765.041</td>
<td>357</td>
<td>173.011</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1753945.000</td>
<td>360</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>62953.531</td>
<td>359</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p < .05, ** p < .01, *** p < .001

a. R squared = .019 (Adjusted R squared = .013)

Results showed that there was no significant difference between participants who had high, moderate, or low online English-speaking interaction levels regarding the other SLA component, repetition records.

B. Online speaking interaction levels vs speaking grades.
The ANOVA test results of the online English-speaking interaction levels led us to test participants’ speaking interaction levels against their speaking and listening final grades specifically. Therefore, the ANOVA test was performed on the three groups and the results showed that there was a statistically significant difference between speaking and listening mean grades of participants who had different levels of online English speaking interaction, F(2,36)=4.12, p=0.017. Post hoc analyses using Tuckey’s HSD indicated that there was a significant mean difference in speaking and listening final grades between participants who had high level of online speaking interaction (M=71.6, SD=13.6) and participants who had low level of online speaking interaction (M=65.1, SD=17.8). with p=.02 as presented in Tables 4.24 and 4.25 and Figure 4.9.
Table 4.24 Descriptive statistics of all three groups of online speaking interaction levels.

**Descriptive Statistics**

<table>
<thead>
<tr>
<th>Dependent Variable: Listening &amp; speaking grades</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online speaking interaction</td>
</tr>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>Low</td>
</tr>
<tr>
<td>Moderate</td>
</tr>
<tr>
<td>High</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Figure 4.9 Mean speaking final grades of students with high, moderate, and low online speaking interaction levels

Table 4.25 ANOVA test results of all three groups of online speaking levels.

**Tests of Between-Subjects Effects**

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of squares</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>1957.080</td>
<td>2</td>
<td>978.540</td>
<td>4.128</td>
<td>.017</td>
</tr>
<tr>
<td>Intercept</td>
<td>1162923.062</td>
<td>1</td>
<td>1162923.062</td>
<td>4906.325</td>
<td>.000</td>
</tr>
<tr>
<td>Online speaking interaction</td>
<td>1957.080</td>
<td>2</td>
<td>978.540</td>
<td>4.128</td>
<td>* .017</td>
</tr>
<tr>
<td>Error</td>
<td>84618.020</td>
<td>357</td>
<td>237.025</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1839672.000</td>
<td>360</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>86575.100</td>
<td>359</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p < .05, ** p < .01, *** p < .001

a. R squared = .023 (Adjusted R squared = .017)
C. Online reading and writing interaction levels vs SLA and grades breakdown.

The second and third statistical analysis tests in the level of online interaction variable part was to test the SLA and skills specific grades among participants of different levels of reading and writing online interaction. An ANOVA test was performed on the three groups across both skills and the result showed that there was no statistically significant difference between the mean total final grades and grades breakdown of participants who had different levels of reading and writing online interaction. However, post hoc analyses using Tuckey’s HSD indicated that there was a significant mean difference regarding writing final grades between participants who had high level of online writing interaction ($M=39.7$, $SD=14.7$) and participants who had moderate level of online writing interaction ($M=64.8$, $SD=17$) with a $p=.044$ as presented in Table 4.26 and Figure 4.10.

Table 4.26 Post hoc Tuckey HSD test of high and moderate groups of online writing interaction levels.

<table>
<thead>
<tr>
<th>Multiple Comparisons</th>
<th>Dependent Variable: Writing grades</th>
<th>Tukey HSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>(I) Level of online writing interaction</td>
<td>(J) Level of online writing interaction</td>
<td>Mean Difference (I-J)</td>
</tr>
<tr>
<td>Moderate</td>
<td>Low</td>
<td>-2.94</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>-4.84*</td>
</tr>
<tr>
<td>High</td>
<td>Low</td>
<td>1.90</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>4.84*</td>
</tr>
</tbody>
</table>

* $p < .05$, ** $p < .01$, *** $p < .001$
Results showed that there was no significant difference between participants who had high, moderate, or low online English reading and writing interaction levels regarding the other SLA component, repetition records.

D. Online listening interaction levels vs SLA and grades breakdown.
The last statistical analysis test in the level of online interaction variable part was to test the SLA and grades breakdown among participants of different levels of online listening interaction. Data showed that 16 participants had a low level of online English listening interaction, while 58 had moderate and 286 had high level of online listening interaction. An ANOVA test was performed on the three groups and the result showed that there was a statistically significant difference between the mean total final grades of participants who had different level of online listening interaction, F(2,36)=3.48, p=0.03. In addition, there was a statistically significant difference in grades breakdown as well, F(2,36)=3.07, p=0.05. Post hoc analyses using Tuckey’s HSD didn’t indicate the exact significant mean difference between the three groups of participants. However, the mean total final grades and grades breakdown increased as the level of online English listening interaction goes higher as presented in Tables 4.27, 4.28, 4.29 and 4.30 and Figures 4.11 and 4.12.
Table 4.27 ANOVA test results of all three groups of online listening levels vs total grades.

Tests of Between-Subjects Effects
Dependent Variable: Total final grades

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>1206.988*</td>
<td>2</td>
<td>603.494</td>
<td>3.489</td>
<td>.032</td>
</tr>
<tr>
<td>Intercept</td>
<td>472208.815</td>
<td>1</td>
<td>472208.815</td>
<td>2730.170</td>
<td>.000</td>
</tr>
<tr>
<td>Level of online listening interaction</td>
<td>1206.988</td>
<td>2</td>
<td>603.494</td>
<td>3.489</td>
<td>* .032</td>
</tr>
<tr>
<td>Error</td>
<td>61746.542</td>
<td>357</td>
<td>172.960</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1753945.000</td>
<td>360</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>62953.531</td>
<td>359</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p < .05, ** p < .01, *** p < .001
a. R squared = .019 (Adjusted R squared = .014)

Table 4.28 Descriptive statistics of all three groups of online listening levels vs total grades.

Level of online listening interaction
Dependent Variable: Total final grades

<table>
<thead>
<tr>
<th>Level of online listening interaction</th>
<th>Mean</th>
<th>Std. Error</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>63.31</td>
<td>3.288</td>
<td>16</td>
</tr>
<tr>
<td>Moderate</td>
<td>65.50</td>
<td>1.727</td>
<td>58</td>
</tr>
<tr>
<td>High</td>
<td>69.44</td>
<td>.778</td>
<td>286</td>
</tr>
</tbody>
</table>
### Table 4.29 ANOVA test results of all three groups of online listening levels vs listening grades.

#### Tests of Between-Subjects Effects

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of squares</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>1464.926&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2</td>
<td>732.463</td>
<td>3.072</td>
<td>.048</td>
</tr>
<tr>
<td>Intercept</td>
<td>485440.005</td>
<td>1</td>
<td>485440.005</td>
<td>2036.209</td>
<td>.000</td>
</tr>
<tr>
<td>Level of online listening</td>
<td>1464.926</td>
<td>2</td>
<td>732.463</td>
<td>3.072</td>
<td>* .048</td>
</tr>
<tr>
<td>interaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>85110.174</td>
<td>357</td>
<td>238.404</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1839672.000</td>
<td>360</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>86575.100</td>
<td>359</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p < .05, ** p < .01, *** p < .001

a. R squared = .017 (Adjusted R squared = .011)
Table 4.30 Descriptive statistics of all three groups of online listening levels vs listening grades.

<table>
<thead>
<tr>
<th>Level of online listening interaction</th>
<th>Mean</th>
<th>Std. Error</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>63.62</td>
<td>3.860</td>
<td>16</td>
</tr>
<tr>
<td>Moderate</td>
<td>66.62</td>
<td>2.027</td>
<td>58</td>
</tr>
<tr>
<td>High</td>
<td>70.77</td>
<td>.913</td>
<td>286</td>
</tr>
</tbody>
</table>

Results showed that there was no significant difference between participants who had high, moderate, or low online English listening interaction levels regarding the other SLA component, repetition records.

In summary, this section of the findings chapter outlined results of all statistical analysis tests in regard to the third independent variable (social online interaction). The social online interaction variable was tested against the two components of the dependent variable (SLA). In addition, it was tested against breakdown of grades for all four English courses (writing final grades, reading final grades, listening final grades and speaking final grades) due to the specific questions about individual English skills.
The results showed that there was a significant difference between students who participated in different levels of online social interaction by writing, reading, listening or speaking English. The most significant difference was found in the mean total final grades and specific grades for listening and speaking in favour of participants who highly interact socially online by listening and speaking, compared to participants who had low online social interaction in the areas of listening and speaking. In addition, a significant difference was found in the writing mean grades in favour of participants who highly interact socially online by writing, compared to participants who had low online social interaction and were ranked as having low writing. However, no significant difference was found in the other component of SLA, the repetition records.

A comprehensive table that details all statistically significant results across all the tests in this study is attached in Appendix G.

In the next section, discussion of the results of correlational data analysis will be presented.

### 4.2 Discussion of correlational data analysis

The study aimed to investigate the relationship between EFL Students’ Language Achievement (SLA) and playing digital games in English. SLA was measured by two components: final grades and repetition record (failing in one or more courses). A student’s final grade was a cumulative score of the student’s quizzes, exams, and assignments throughout an entire semester in all English courses. The second component of SLA was students’ repetition record which aimed to signal whether a student had failed to reach a passing grade in one or more courses. The overall results showed that higher final grades and lower repetition rate were associated with a higher SLA level.

The two SLA components were tested against three aspects of digital gaming including (1) students’ patterns of playing digital games (how frequently students play digital games), (2) the type of digital games they play in relation to English exposure and use defined as rich, moderate or low in language games, (3) the amount of social interaction students engage in English whilst gaming online, particularly in relation to speaking, listening, writing and reading.

This section of the chapter will provide a summary and discuss the correlational analysis results presented in the previous section.
4.2.1 Pattern of playing digital games and SLA

This study tested the possible effect of students’ patterns of playing digital games in three categories:

1. Years of play (expert – novice)
2. Days of play per week (experienced – non-experienced)
3. Hours of play per day (heavy – moderate – low)

4.2.1.1 Years of play (expert – novice).

First, the study tested the length of exposure to digital games in regard to how many years students had been playing, and their SLA. The length of play was described as “years of play” and students were marked as expert or novice gamers accordingly. Students who had been playing digital games for four years or more were marked as expert gamers, the rest of the students who had been playing for less than four years were marked as novice gamers. This classification was chosen to be tested because a number of studies in the literature had discussed the possible effect of playing digital games for several years on EFL language proficiency. The study of Rogers and Johnson (2016) reported on Saudi EFL students’ digital gameplay habits and effects and whether a long-period of exposure to digital games could positively influence EFL students’ language learning. Rogers and Johnson (2016) stated that expert gamers in their study played digital games for more than six years. This study investigated students’ years of play and their SLA performance in its two different components. As described in the methodology chapter, years of play data were analysed in a continuum scale starting from no years of play until more than four years, to indicate how many years of play were significant to SLA.

The results showed that there was a statistically significant difference in students’ final grades in relation to their years of play. It was found that students who had been playing digital games for four years or more had significantly higher grades than those who have been playing for less than four years. The effect of years of play can be noted on students’ language proficiency if they had at least four years’ experience in digital games. This finding implies that EFL students’ exposure to digital games for four years can positively add to their language proficiency. The Rogers and Johnson (2016) study considered expert gamers as those who have 6–10 years gaming experience, whereas most of the studies in the literature categorised gamers as expert or novice according to a dichotomous survey question. However, according to the findings of this study,
gamers can be considered as expert if they had only four years of digital gaming experience. The effect on students’ language proficiency due to four-years (or more) exposure to the target language was indicated in their higher level of SLA. In other words, EFL students/gamers don’t need to game for 6 years or more before there is a positive effect on their language.

Therefore, playing digital games might be perceived as an extramural language activity that added to expert gamers’ language proficiency. Novice gamers, on the other hand, had either ignored or misused a potential language learning tool. According to Chik’s (2011) study, “when the novice gamers were learning to play games, they did not see the process as learning; they felt that as adults, they should be able to win very quickly. These gamers also found reading the game manuals to be “time-consuming and non-productive” (p. 161).

Expert and novice gamers’ repetition record was measured as part of their SLA. The data analysis showed that expert gamers had a significantly lower rate of repeaters than novice gamers. According to the results reported above, this means that expert gamers scored higher final grades and had mostly passed previous levels without failing in any course. On the other hand, novice gamers who had lower final grades had higher rate of students who previously repeated one course or more. The results of total the final grades and repetition rate contributed to a significantly higher SLA in favour of expert gamers who had been playing digital games for four years or more.

4.2.1.2 Days of play per week (experienced – non-experienced).

Next, students’ weekly routine of playing digital games was tested against their SLA. The students’ weekly routine was measured by the number of days they play digital games per week. Accordingly, students were categorised as experienced if they played for 3 days a week or more, or non-experienced gamers if they played for 2 days a week or less. However, the data didn’t show any logical trend or tendency in relation to SLA and their weekly playing routine. Although there was a significant difference in students’ final grades, there was no consistent or interpretable pattern that can be related to students’ weekly playing routine. In addition, the same finding was evident for students’ repetition rate and the number of days they played.

4.2.1.3 Hours of play per day (heavy – moderate – low).

The last category of students’ pattern of play examined students’ daily playing routine (how many hours they play) during weekdays and weekends, and whether there was a relationship with their
SLA. The distribution of students according to their daily hours of play did not show any significant difference in SLA between all groups either during weekdays or weekends. Students’ final grades and repetition rate did not show any trend or tendency in relation to students’ daily frequency of play.

The study of Sylvén and Sundqvist (2012) showed that there was a relationship between the frequency of hours of playing digital games and English language achievement. They measured participants’ language proficiency in regard to their reading, listening, and vocabulary grades. Unlike the Sylvén and Sundqvist (2012) study, in this study participants’ overall language proficiency was tested using final cumulative grades and repetition rate in relation to their gaming frequency relating to how many hours of daily play. However, no significant differences were demonstrated.

Finally, students were categorised as heavy, moderate, or low gamers according to the classification of the Jansz and Martens (2005) and De Schutter (2010) studies of daily playing frequency for digital gamers which was explained in Chapter 3. The results showed that there was no significant relationship between being a heavy, moderate, or low gamer regarding all components of SLA. Therefore, the number of hours played in a day didn’t have an effect on students’ language proficiency.

4.2.1.4 Summary and discussion.

In summary, the long period of exposure to digital games had more effect on EFL students’ language proficiency than the frequency of either daily or weekly playing times. The SLA results of expert gamers who had a history of playing digital games for at least four years were significantly higher than for novice gamers who had less than four years of exposure to playing digital games. Expert gamers scored significantly higher than novice gamers in two SLA components, final grades and repetition record. The frequency of play routine, either daily or weekly playing times, had no significant effect on EFL students’ language proficiency.

Unlike other studies that found a correlation between long hours/days of playing digital games and EFL learning, the results of this study found that there was no correlation between frequent playing of digital games (in regard to hours per day or days per week) and EFL learning. However, the only finding in the pattern of playing digital games was in favour of expert gamers who had long-term (more than four years) exposure to digital games.
Therefore, the results of this study support the principles of the informal and incidental learning theory. Theoretically, informal and incidental language learning is believed to occur through long-term exposure to the target language either via digital games or any other digital resources such as movies, songs, or television programs (Chik, 2014). EFL students with long-term exposure to the target language are believed to have the opportunity to learn the target language incidentally (Alavi & Keyvanshekouh, 2012). The findings of the correlational analysis of this study showed that expert gamers benefited incidentally from their four years or more of repeated exposure to the target language through playing digital games, which positively affected their SLA.

4.2.2 Types of digital games and SLA

After exploring the relationship between students’ pattern of play and SLA, the next step was to explore the relationship between SLA and the types of games in relation to the extent of the use of the English language. Three groups of games were identified from the literature: rich in language use games; moderate in language games; and low in language games. The classification of the types of games was explained in detail in the methodology chapter.

The data was analysed in two steps:

1. The analysis of the relationship between each type of game and SLA: comparing SLA of each group separately, against other groups.
2. Combined analysis: comparing SLA of all tested groups together.

4.2.2.1 Separate analysis of each type of games and SLA.

Firstly, the SLA of students who responded that they play rich in language games were compared to SLA of the rest of the group i.e. the combined SLA of those who indicated that they either played moderate or low in language games. The results showed that students who play rich in language games had significantly higher total final grades in English than the students who played games with moderate or low level of language (p=0.004). In addition, the students who play rich in language games had a lower repetition rate in language courses compared to the other two groups. Then, the same test was performed to both of the other two groups to confirm the validity of this result. The results showed no significant difference in SLA regarding the other two groups,
which emphasized that the most significant positive relationship was between SLA and grades of students who play rich in language games.

4.2.2.2 Combined analysis of all groups and SLA.

Two additional analyses were completed to add more details to the results. First, surveyed participants were grouped into three different groups according to their selection of different types of games: those who indicated that they played: (1) rich in language games, (2) moderate in language games but who didn’t select rich in language games, and (3) low in language games (but didn’t select rich or moderate). The results showed that students who indicated that they play rich in language games had significantly higher total final grades than the students who played games with a low level of language ($p=.016$).

Second, surveyed participants were grouped into six different groups according to their selection of different types of games: those who indicated that they play (1) rich in language games only, (2) rich and moderate together, (3) moderate only, (4) moderate and low together, (5) low only, (6) and finally those who selected all three options. The rationale for the choice of groups was to specifically test the SLA among all students’ selections and observe the potential differences. The results showed that students who indicated that they played rich in language games only ($p=.055$), and who indicated that they played rich and moderate in language games ($p=.033$), had significantly higher SLA than students who indicated that they played low in language games only. Moreover, students’ repetition rate decreased as the amount of language in the games they played increased.

Therefore, all of the results showed that participants who indicated that they play rich in language games had significantly higher SLA.

4.2.2.3 Discussion.

Overall, the findings of this part of the study indicated that EFL students who play rich in language games showed higher English language proficiency. This is not surprising, as numerous researchers noted that games such as adventure/story-mode, role-playing, and simulation games (classified in our study as rich in language games) provide gamers with plentiful language exposure and use (Bronstring, 2012; Cornillie, Clarebout, & Desmet, 2012). In addition, this type of game requires gamers to acquire and interactively use a significant amount of language to be
able to play and proceed to advanced levels of the game. (Whittaker, 2013; Chik, 2014). Some studies directly point to the possibility for EFL learning in adventure games (Chen et al., 2012), and improving conversational skills in role-playing games (Rankin, Gold, & Gooch, 2006). Gee (2012) argued that digital games provide a rich environment for meaningful vocabulary building as they associate words with images, actions, goals and dialogue, not only with definitions or other words.

While these studies discussed the potential of digital games in English language learning, there is still little evidence of the relationship between language proficiency and the type of digital games. Some studies provided fragmented evidence either by studying the effect of a specific game or genre on language learning (Marek Bronstring, 2012; Whittaker, 2013; Cornillie, Clarebout, & Desmet, 2012; Rogers, 2014) or by studying the effect of digital games on a specific language skill – reading, listening, etc. (Rankin, Gold, & Gooch, 2006; Whittaker, 2013; Sundqvist and Wikström, 2015).

This study adds to the existing literature by providing statistically significant evidence of the relationship between playing different types of games based on the richness of language exposure and use, and the overall EFL students’ achievement.

From a theoretical point of view, the claim that playing rich in language games in different genres – adventure, role-playing, simulation games – had an effect on EFL students’ English learning is in line with the informal and incidental language learning theory (Marsick & Watkins 1990; 2008), as well as Vygotsky’s sociocultural theory (1978; 1986) which provide the theoretical lenses for this study. Even though language in digital games is used to achieve the gaming goal, rather than a learning goal, indirect and incidental language learning can take place. According to Cornillie et al. (2011), “adventure games entail a focus on meaning, rather than a focus on isolated linguistic forms, which creates possibilities for the incidental learning of a L2” (p. 2). Vygotsky’s sociocultural perspective provides a framework that language is acquired in social interactions, and particularly in the zone of proximal development where scaffolding of language learning can occur (Vygotsky, 1986; Lantolf & Thorne, 2008). For example, the Sylvén and Sundqvist (2012) study argued that rich in language games such as online role-playing games can “provide L2 English learners with a linguistically rich and cognitively challenging virtual environment that may be conducive to L2 learning, as learners get ample opportunities for L2 input and scaffolded interaction in the L2” (p. 302).
4.2.2.4 Summary.

To sum up, the correlational analysis of this study provided a clear indication that rich in language games are indirectly connected to EFL students’ language learning achievements. Specifically, EFL students who play rich in language games (such as adventure or role-playing games) had higher levels of SLA than students who play digital games that were low or moderate in language (such as sport or car racing games). Additionally, students who play moderate language games and combined it with playing rich in language games also had significantly high levels of SLA. The results of this section provided empirical, statistically significant evidence to support the literature that discussed the potential impact of playing rich in language digital games on EFL language learning.

In the next section, a discussion of the relationship between SLA and online interaction while playing online digital games will be presented.

4.2.3 Online social interaction and SLA

This part of the results focused on the relationship between SLA and the amount of social interaction in English students engage in while playing online digital games. In addition to SLA, this part specifically discussed the relationship between online social interaction and particular English skills (reading, writing, listening, and speaking). Overall, the results showed a significant positive relationship between the amount of online social interaction and SLA. Also, the study found a positive relationship specifically in students’ speaking, listening, reading and writing final grades with online social interaction.

The results in this section will be presented in two parts:
1. Overall final grades and students’ online social interaction.
2. Specific English courses grades and students’ online social interaction.

4.2.3.1 Overall final grades and students’ online social interaction.

Similar to previous sections, tests were performed between SLA (total final grades and repetition record) and the amount of different types of social interaction. The amount of social interaction was determined through a Likert scale ranging from 1–5. The different types of social interaction were; 1) online interaction by reading, 2) online interaction by writing, 3) online interaction by listening, 4) online interaction by speaking. The major finding in this section was that students
who indicated that they usually interact by high level of interaction using listening, speaking, or reading English while playing online digital games had significantly higher overall final grades in comparison to others who had a low level of interaction. The exposure to English through interacting with other gamers online via speaking, listening, and reading might have significantly improved students’ language proficiency and had a positive impact on their overall final grades. According to Dixon and Christison (2018) playing online digital games can promote second language acquisition because they offer opportunities for social interaction in L2 through collaborative problem-solving tasks. In addition, the demand for language input and output to successfully play the game requires gamers to interact in the target language.

However, one result of the relationship between online social interaction and students’ total final grades showed no significance. Unlike online social interaction using reading, speaking and listening, the amount of online social interaction by English writing had no effect on students’ total final grades.

Another interesting finding was that the repetition rate indicated by the number of courses that students had failed, decreased as the amount of social interaction increased. Students who interacted with others frequently either by listening, reading, writing, or speaking English had lower repetition rate than students who didn’t regularly interact with other gamers online.

4.2.3.2 Specific English skills grades and students online social interaction.
Tests were performed between the final grades of each specific English course (reading, writing, listening, and speaking) and the amount of interaction by different types of online social interaction, reading, writing, listening and speaking. Students’ final grades in the speaking course were tested against the different levels of online speaking interaction, students’ final grades in the writing course were tested against the different levels of online writing interaction, students’ final grades in the listening course were tested against the different levels of online listening interaction, and students’ final grades in the reading course were tested against the different levels of online reading interaction.

The first finding was that students who indicated that they had high level of speaking interaction while playing online digital games had significantly higher speaking grades in comparison to students who had a low level of speaking interaction. The second finding was that
students who indicated that they had high level of listening interaction while playing online digital games had significantly higher listening grades.

Some previous studies indicated that there might be a positive effect of online social interaction on ESL students’ listening and speaking skills. For example, a study by Wu, Richards, and Saw (2014) provided ESL students with approximately one hour of gameplay of an online game called Everquest 2. Participants were observed while playing the game and then interviewed afterward to reflect on this experience in regard to English language learning. The Wu, Richards, and Saw (2014) study stated that online gaming “values and promotes the power of multi-directional communications and, through communication, gaming experience is enriched and opportunity for using English for communicative purposes thrives.” (p. 81). Sourmelis, Ioannou, and Zaphiris (2017) investigated digital games that provide online interaction with other gamers. The study reported that communication – through speaking and listening to the target language – while playing online is necessary to coordinate, socialize, and work as a team. The study indicated that online games “are designed in ways that promote communication, making language learning an authentic experience that involves interaction with native speaking co-gamers” (p. 44) Another study investigated the effect and willingness to communicate among five EFL students who participated in a 15-weeks online game-based language intervention. Several interviews were conducted with the participants to identify what impact gameplay had on their willingness to communicate in English. The results found positive effects for playing online multiplayer games on interacting in the target language and on learner confidence and willingness to communicate in English (Reinders & Wattana, 2015).

The last finding in this section was that students who indicated that they had high level of writing interaction while playing online digital games – either by communication with other gamers in chat rooms or in-game writing – had significantly higher writing grades in comparison to students who had a moderate and low level of writing interaction. According to Chik (2014), “Good games engage players not only in playing the game, but also in reading and writing about them on interest-driven websites. These game-related texts are not just practical texts for instructions and strategy training, they are also imaginative and creative outputs developed by gamers and circulated in online gaming communities” (p. 87). The Olsson (2012) study showed a positive correlation between Extramural English (EE) and Swedish EFL writing grades. One of the EE aspects was playing digital games in addition to others such as; watching TV and listening
to music in English. Olsson (2012) claimed that “a combination of factors is probable and that Extramural English is one factor that may indeed enhance writing proficiency” (p. 131-132).

The studies outlined above presented the qualities and learning possibilities that online gaming might provide to EFL/ESL learners. Most of these studies indicated that there might be a relationship of cause and effect either by investigating language learners’ or teachers’ perceptions or by studying the qualities and affordances of these digital games (Wu et al., 2014; Sourmelis et al., 2017; Reinders & Wattana, 2015), however, the vast majority of these studies focused on the application of digital games within the classroom contexts. A limited number of studies (such as: Olsson, 2012; Sylvén & Sundqvist, 2012) considered the effect of these digital games on EFL students’ language learning, while they were played as part of their leisure time out of school. Therefore, this study is filling this gap of the literature. The findings of this section of this study provided statistically significant evidence of the relationship between social interactions while playing digital games and SLA in general, in addition to the effect of specific means of interaction on the related English skills’ grades. The finding of the relationship between students’ writing grades and their social interaction via writing confirmed what had been found previously with Swedish EFL students (Olsson, 2012). However, the focus in the Olsson (2012) study was on extramural English in general which included playing digital games in English, while this finding in our study was mainly and specifically in regard to online interaction via digital games.

The findings of the relationship between SLA and levels of interaction while online gaming were consistent with Vygotsky’s sociocultural theory (1978; 1986) which informed this study. Although the language learning while online gaming is indirect and incidental, there is an indication that gamers’ interaction while online gaming might be a real factor that influences the language learning process. Sylvén and Sundqvist (2012) argued that interactions through online gaming provide a motivational environment that facilitates acquiring a second language through offering scaffolding and comprehensible inputs. Vygotsky’s sociocultural theory points out the necessity for input that falls within the learners’ Zone of Proximal Development (ZPD), in addition to guidance by interacting with more qualified peers. EFL gamers are in the ZPD while online gaming because they have joint points of reference and they are not far from each other in their level of development; therefore, they enrich each other’s learning as they are within intersubjectivities (Vygotsky, 1978). Both conditions apply when playing online digital games and interacting with either native speakers or EFL co-gamers.
In summary, this section presented the results of the relationship between SLA and students’ social interaction while playing online games. Students’ social interaction either by reading, writing, speaking or listening was tested against SLA and specifically against final grades of each of the four English skills. The results showed that there was a significant relationship between overall SLA and the amount of social interaction they engaged in via listening, speaking, or reading. Students had higher grades in listening, speaking and writing courses as the amount of their social interaction via listening, speaking and writing increased. In other words, students who usually speak to others in English while playing online digital games had better grades in their speaking course. Students who usually listen to others in English while playing online digital games had better grades in their listening course. Finally, students who usually write to others in English while playing online digital games had better grades in their writing course.

4.2.4 Summary

This section of the chapter discussed the results and findings of the correlational analysis of the study. A comprehensive and detailed discussion of the results was presented in line with the chapter’s structure. Moreover, the discussion linked the current study results with related literature, and with the study’s theoretical framework. This study explored and tested the three different dimensions of: 1) frequency of gaming, 2) type of games, and 3) online social interaction while gaming. In addition, this research used students’ actual study results after a semester-long period of language learning which were used as the comparison variables in this study.

4.3 Chapter conclusion

This chapter started with a detailed presentation of the results and findings of the correlational data analysis of the study. The correlational data analysis section was followed by a comprehensive discussion of these findings. The correlational data analysis and discussion section of the chapter represent the main quantitative findings of the study and showed strong and significant correlational findings on the relationship between playing digital games and EFL learning.

In the next chapter, and in line with the sequential mixed methods design of the study, a presentation and discussion of students’ perceptions will be presented. The next chapter will discuss perceptions of the overall sample of participants as well as perceptions of participants with rich in language game experiences, which were assessed using a Likert scale. In addition, the
results of student focus groups sessions will also be presented. The three focus groups sessions represent the qualitative data in this study.
CHAPTER 5: STUDENTS’ PERCEPTIONS OF THE EFFECTS OF PLAYING DIGITAL GAMES ON EFL LEARNING: DATA ANALYSIS AND DISCUSSION

This chapter presents and discusses the perceptions of the participants of this study in regard to the effect of digital games on EFL learning based on the findings from the last section of the questionnaire (Part V) and the focus groups. The chapter is divided into three sections. The first section will present and discuss the perceptions of the overall sample in the study, that were captured in the last part of the questionnaire. In addition, the first section will then compare the perceptions of participants who mostly played games with “rich in language game experiences” to the perceptions of the remaining sample of students. The second section of this chapter will present the results of the focus groups that further explored students’ perceptions. Finally, in the third section of this chapter, a discussion of the students’ perceptions that integrates the findings from the questionnaire and the focus groups will be presented.

5.1 Students’ perceptions as captured in part V of the questionnaire

This section presents the findings from the last part (Part V) of the questionnaire which primarily served to capture students’ opinions and perceptions on the effect of digital games on their EFL learning. Students rated 15 questions on a Likert scale (from strongly agree to strongly disagree) to indicate their perceptions of, and motivation towards, EFL learning in relation to playing different types of digital games. In addition, students had to specify which type of language skills (speaking, listening, reading, writing, grammar) that they thought they learnt the most while engaging in playing these games (See Appendix A for questionnaire).

The findings in this section are first presented in relation to the whole cohort of students (section 1.1), and then for a selected group of students with rich in language game experiences (section 1.2).

5.1.1 Analysis of perceptions of the effects of playing digital games on EFL learning: The whole cohort of students

This section presents the analysis of perceptions for the overall cohort of students. The 15 questions in this part of the questionnaire were designed to capture three major aspects of EFL learning:
1. The students’ overall EFL learning (8 questions)
2. The students’ motivation and EFL learning (2 questions)
3. The students’ perceptions relating to specific English skills (5 questions)

The data below is presented in relation to these three categories. While questions were grouped in the questionnaire, the categories were not displayed to the students, to avoid adding an extra layer of meaning to the questions. The numbers of the questions are indicative of how they were numbered in the questionnaire (Appendix A, Part V of the questionnaire).

5.1.1.1 Students’ perceptions of the effect of digital games on EFL learning.
Participants’ responses revealed a trend toward perceived positive effect of playing digital games on overall EFL learning (more than 80% of combined positive answers – “strongly agree” and “agree” – to questions 1, 2, 3 & 8, as presented in Table 5.1 and depicted in (Figure 5.1) below.

![Figure 5.1 Students’ perceptions of the effect of digital games on EFL learning (the whole cohort).](image)

Detailed descriptive statistics of the answers to all the eight questions which captured students’ perceptions about playing digital games and EFL learning are presented in Table 31 below.
Table 5.1 Students’ perceptions of the effect of digital games on EFL learning (the whole cohort, N=379).

<table>
<thead>
<tr>
<th>Question number (as in Part V of the questionnaire)</th>
<th>Questions</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 1</td>
<td>I learn new words and expressions playing digital games.</td>
<td>184 48.5</td>
<td>136   35.9</td>
<td>47 12.4</td>
<td>11 2.9</td>
<td>1 0.3</td>
</tr>
<tr>
<td>Question 2</td>
<td>Sound bites, pictures, and graphics helped me to get the meaning better.</td>
<td>205 54.1</td>
<td>119   31.4</td>
<td>42 11.1</td>
<td>11 2.9</td>
<td>2 0.5</td>
</tr>
<tr>
<td>Question 3</td>
<td>I think language learning through digital games is interesting.</td>
<td>211 55.7</td>
<td>122   32.2</td>
<td>34 9.0</td>
<td>11 2.9</td>
<td>1 0.3</td>
</tr>
<tr>
<td>Question 4</td>
<td>Digital games could be used to effectively teach a foreign language.</td>
<td>143 37.7</td>
<td>113   29.8</td>
<td>87 23.0</td>
<td>31 8.2</td>
<td>5 1.3</td>
</tr>
<tr>
<td>Question 5</td>
<td>Playing digital games relevant to foreign language coursework would be a valuable use of class time.</td>
<td>115 30.3</td>
<td>116 30.6</td>
<td>84 22.2</td>
<td>47 12.4</td>
<td>17 4.5</td>
</tr>
<tr>
<td>Question 6</td>
<td>Playing digital games relevant to foreign language coursework would be a valuable use of out-of-class time.</td>
<td>137 36.1</td>
<td>138 36.4</td>
<td>66 17.4</td>
<td>30 7.9</td>
<td>8 2.1</td>
</tr>
<tr>
<td>Question 7</td>
<td>Digital games and school should be kept separate</td>
<td>62 16.4</td>
<td>99    26.1</td>
<td>101 26.6</td>
<td>60 15.8</td>
<td>57 15.0</td>
</tr>
<tr>
<td>Question 8</td>
<td>Digital games provided opportunities for developing language fluency</td>
<td>188 49.6</td>
<td>146   38.5</td>
<td>35 9.2</td>
<td>9 2.4</td>
<td>1 0.3</td>
</tr>
</tbody>
</table>
In line with the general trend, most of the students indicated that they either “strongly agree” or “agree” that digital games can help in developing language fluency (question 8; 49.6% and 38.5% respectively; combined 88.1%). Most of the students also indicated that they either “strongly agree” or “agree” that EFL learning through digital games is interesting (question 3; 55.7% and 32.2% respectively; combined 87.9%). In addition, a similar number of students indicated that they either “strongly agree” or “agree” that they learn new words and expressions (questions 1; 48.5% and 35.9% respectively; combined 84.4%), and that sounds, pictures and graphics in games help them understand the meaning of words (question 2; 54.1% and 31.4% respectively; combined 85.5%).

In regard to using digital games by teachers, the majority of the students either “strongly agree” or “agree” that digital games could be used for EFL teaching (question 4; 37.7% and 29.8% respectively; combined 67.5%). Further, many students either “strongly agree” or “agree” that using games in the formal classroom would be a good idea (question 5; 30.3% and 30.6% respectively; combined 60.9%). However, a significant number of students also indicated that they “strongly agree” and “agree” that playing digital games related to EFL learning is better used outside of the classroom (question 6; 36.1% and 36.4% respectively, combined 69.5%). The students were indecisive as to whether playing games and formal teaching of EFL should be separated, with some students “strongly agree” or “agree” (question 5; 16.4% and 26.1% respectively, combined 42.5%), some students were unsure (26.1%), and some students chose “disagree” or “strongly disagree” (15.8% and 15.0% respectively, combined 30.8%).

Overall, the perceptions for the whole cohort of students demonstrated a trend towards perceived positive effects of digital games on their EFL learning with some students considering a possibility of using such games for EFL teaching.

5.1.1.2 Students’ motivation and EFL learning.

Two questions related to students’ perceived motivation and EFL learning (presented in Table 5.2). Question 9 (listed in Table 5.2) considered whether playing digital games was similar to being in an English-speaking country or not. The perception of being in an English-speaking country could be considered as an indicator of motivation toward EFL learning (Arnold & Fonseca-Mora, 2015). Question 10 asked explicitly whether playing digital games was a motivator for EFL learning (Table 5.2).
The data revealed a general trend toward the perceived motivating effects of digital games for EFL learning as the majority of participants provided mostly positive responses (either “strongly agree” or “agree”) that playing digital games make them want to learn English and feel like they are in an English-speaking country, as depicted in Figure 5.2, and listed in Table 5.2.

![Figure 5.2 Students’ perceptions about gaming and their motivation towards EFL learning (the whole cohort).](image)

Detailed descriptive statistics of the answers to the two questions which captured students’ perceptions about gaming and their motivation towards EFL learning are presented in Table 5.2:

Table 5.2 Students’ perceptions about gaming and their motivation towards EFL learning (the whole cohort, N=379).

<table>
<thead>
<tr>
<th>Question number (as in Part V of the questionnaire)</th>
<th>Questions</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 9</td>
<td>When gaming, I felt like I was in an English-speaking country</td>
<td>93</td>
<td>24.5</td>
<td>139</td>
<td>36.7</td>
<td>108</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>35</td>
<td>9.2</td>
<td>4</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>Question 10</td>
<td>Playing digital games makes me want to learn English</td>
<td>182</td>
<td>48.0</td>
<td>132</td>
<td>34.8</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13</td>
<td>3.4</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

130
The data revealed a general trend toward the perceived motivating effects of digital games for EFL learning as the majority of participants either “strongly agree” or “agree” that playing digital games make them want to learn English (question 10; 48% and 34.8% respectively; combined 82.8%). Also, many students either “strongly agree” or “agree” that during gaming they feel as if they are in an English-speaking country (question 9; 24.5% and 36.7% respectively; combined 61.2%), with only a small number of students stating that they “strongly disagree” or “disagree” on that question (question 9; 9.2% and 1.1%; combined 10.3%).

5.1.1.3 Students’ perceptions of the effect of digital games on specific English skills.
Overall, the students’ answers about the perceived effect of playing digital games on specific English skills were positive, especially for listening, speaking and reading (questions 11–13). There was less positive effect for Writing, and Grammar (questions 14–15), as depicted in Figure 5.3 below and further detailed in Table 5.3.

![Figure 5.3 Students’ perceptions about the effect of digital games on specific English skills (the whole cohort).](image-url)
Descriptive statistics for the answers to all the five questions related to students’ perceptions about the effect of digital games on specific English skills are presented in Table 5.3 below.

Table 5.3 Students’ perceptions about the effect of digital games on specific English skills (the whole cohort, N=379).

<table>
<thead>
<tr>
<th>Question number (as in Part V of the questionnaire)</th>
<th>Questions</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Question 11</td>
<td>During playing digital games I learn English listening skills</td>
<td>187</td>
<td>49.3</td>
<td>139</td>
<td>36.7</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11</td>
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<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Question 12</td>
<td>During playing digital games I learn English speaking skills</td>
<td>130</td>
<td>34.3</td>
<td>156</td>
<td>41.2</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>22</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Question 13</td>
<td>During playing digital games I learn English reading skills</td>
<td>152</td>
<td>40.1</td>
<td>155</td>
<td>40.9</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Question 14</td>
<td>During playing digital games I learn English writing skills</td>
<td>78</td>
<td>20.6</td>
<td>116</td>
<td>30.6</td>
<td>109</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>60</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>Question 15</td>
<td>During playing digital games I learn English grammar skills</td>
<td>57</td>
<td>15.0</td>
<td>90</td>
<td>23.7</td>
<td>114</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>73</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>45</td>
</tr>
</tbody>
</table>

The majority of students either “strongly agree” or “agree” that they learn listening skills (question 11; 49.3% and 36.7% respectively; combined 86%), reading skills (question 13; 40.1% and 40.9% respectively; combined 81%), and speaking skills (question 12; 34.3% and 41.2% respectively; combined 75.5%) while playing digital games. However, significantly smaller numbers of students either “strongly agree” or “agree” that digital games have an effect on improving writing skills (question 14; 20.6% and 30.6% respectively; combined 51.2%) or
grammar (question 15; 15% and 23.7% respectively; combined 38.7%). On the other hand, only a small percentage of students “strongly disagree” or “disagree” that playing digital games had an effect on improving their EFL listening, speaking, and reading skills.

5.1.2 Analysis of perceptions of the effects of rich in language game experiences on EFL learning

This section provides analysis of the data from the students who indicated they mostly played rich in language or communication games. This cohort is analysed separately because the correlational statistical analysis tests in this study (presented in Chapter 4) found that Students’ Language Achievement (SLA) level differed significantly among participants according to the types of games they played in regard to language use and the amount of social interaction they engaged in while online gaming (Chapter 4, sections 1.3 & 1.4). Specifically, it was found that having a high level of SLA correlated with the following rich in language game experiences:

1. Playing rich in language games only.
2. Playing both rich and moderate in language games.
3. Interacting highly by speaking while online gaming.
4. Interacting highly by listening while online gaming.

While correlational analysis found a significant connection between playing rich in English language and online communication games and English language achievements, there was no indication in that data whether the students themselves saw this as a meaningful, cause–effect connection. Therefore, it was important to see whether the students who had high EFL achievements thought that playing digital games with rich language and communication experiences influenced such achievements. In other words, while the correlational analysis demonstrated the significant connection between students with rich in language and communication experiences and high SLA, the researchers aimed to explore whether the students’ perceptions indicate a possible cause–effect connection between these variables.

This section presents the analysis of the perceptions of students with rich in language and communication experiences (each of the four abovementioned groups) and compares the results with the remaining sample from the general cohort of students. The aim of this comparison was to see whether students who played digital games with rich in language and communication
experiences perceived that this experience has more significant effect on their EFL learning than the remaining sample of the overall cohort of students who played a mixture of various types of games, as literature indicated (Chik, 2014; Sylvén and Sundqvist, 2012; Reinders and Wattana, 2015).

**5.1.2.1 Perceptions of rich in language (RL) games players.**

Perceptions of participants who indicated that they play rich in language (RL) games only (N=144) showed notable difference in some questions compared to the remaining sample of the overall participants (N=235) as presented in Figure 5.4 and further detailed in Table 5.4 below. Figure 5.4 presents the questions with notable differences in percentage only; other questions with smaller differences can be found in the entire table of perceptions of rich in language games players in relation to all questions (Appendix H).

![Figure 5.4 Perceptions of (RL) games players and the remaining sample of overall participants: combined positive answers comparison.](image)

Detailed descriptive statistics of the comparison between participants who indicated that they play rich in language games only and the remaining sample of overall participants are presented in Table 5.4.
Table 5.4 Comparison between participants who indicated that they play rich in language games only (‘RL’; N=144) and the remaining sample of overall participants (‘All’; N=235).

<table>
<thead>
<tr>
<th>Question number</th>
<th>Questions</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>All</td>
<td>RL</td>
<td>All</td>
<td>RL</td>
<td>All</td>
</tr>
<tr>
<td>Question 1</td>
<td>I learn new words and expressions playing digital games.</td>
<td>39.6%</td>
<td>63.2%</td>
<td>40.0%</td>
<td>29.2%</td>
<td>16.6%</td>
</tr>
<tr>
<td>Question 4</td>
<td>Digital games could be used to effectively teach a foreign language.</td>
<td>31.9%</td>
<td>47.2%</td>
<td>29.8%</td>
<td>29.9%</td>
<td>26.3%</td>
</tr>
<tr>
<td>Question 8</td>
<td>Digital games provided opportunities for developing language fluency</td>
<td>42.1%</td>
<td>61.8%</td>
<td>40.9%</td>
<td>34.7%</td>
<td>13.2%</td>
</tr>
<tr>
<td>Question 11</td>
<td>During playing digital games I learn English listening skills</td>
<td>42.6%</td>
<td>60.4%</td>
<td>37.9%</td>
<td>34.7%</td>
<td>15.3%</td>
</tr>
<tr>
<td>Question 13</td>
<td>During playing digital games I learn English reading skills</td>
<td>33.6%</td>
<td>50.7%</td>
<td>40.9%</td>
<td>38.9%</td>
<td>14.2%</td>
</tr>
</tbody>
</table>

There was an increase of percentage toward the perceived positive effect of digital games on EFL learning compared to the remaining sample of overall participants. The most notable difference was in the increased number of students who “strongly agree” and “agree” that playing digital games helps them in: learning new words (question 1, increase of 12%); developing language fluency (question 8, increase was more than 14%); and learning listening and reading skills (questions 11 & 13, increase about 15% for both). In addition, another notable difference was that students who play rich in language games were more positive about the possible use of games in EFL teaching: their “strongly agree” and “agree” answers to question 4 increased approximately 15% more than the remaining sample of the overall cohort of students. Accordingly,
the number of neutral ("neither agree nor disagree") or negative ("disagree" & strongly disagree") answers to questions 1, 4, 11 and 13 presented in Table 5.4 decreased among the students who played rich in language games as compared to the remaining sample of the overall participants.

5.1.2.2 Perceptions of rich and moderate in language (RML) game players.

Perceptions of participants who indicated that they played both rich and moderate in language (RML) games combined (N=50) showed notable differences in some questions compared to the remaining sample of the overall participants (N=329) as presented in Figure 5.5 and further specified in Table 5.5. Figure 5.5 presents the questions with notable differences in percentage only, other questions with smaller differences can be found in the entire table of perceptions of rich and moderate in language games players in relation to all questions (Appendix I).

![Figure 5.5 Perceptions of (RML) games players and the remaining sample of the overall participants: combined positive answers comparison.](image)

Detailed descriptive statistics of the comparison between participants who indicated that they play rich and moderate in language games combined and the remaining sample of the overall participants are presented in Table 5.5.
Table 5.5 Comparison between participants who indicated that they play rich and moderate in language games combined (‘RML’; N=50) and the remaining sample of the overall participants (‘All’; N=329).

<table>
<thead>
<tr>
<th>Question number</th>
<th>Questions</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>All RML</td>
<td>All RML</td>
<td>All RML</td>
<td>All RML</td>
<td>All RML</td>
</tr>
<tr>
<td>Question 1</td>
<td>I learn new words and expressions playing digital games.</td>
<td>45.6%</td>
<td>37.4%</td>
<td>13.4%</td>
<td>3.3%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Question 3</td>
<td>I think language learning through digital games is interesting.</td>
<td>53.2%</td>
<td>33.1%</td>
<td>10.0%</td>
<td>3.3%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Question 9</td>
<td>When gaming, I felt like I was in an English-speaking country</td>
<td>22.2%</td>
<td>35.3%</td>
<td>31.3%</td>
<td>10.0%</td>
<td>4.0%</td>
</tr>
<tr>
<td>Question 11</td>
<td>During playing digital games I learn English Listening skills</td>
<td>46.8%</td>
<td>37.4%</td>
<td>11.9%</td>
<td>3.3%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Question 12</td>
<td>During playing digital games I learn English speaking skills</td>
<td>32.2%</td>
<td>41.6%</td>
<td>19.1%</td>
<td>6.4%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Question 13</td>
<td>During playing digital games I learn English Reading skills</td>
<td>38.0%</td>
<td>41.0%</td>
<td>15.5%</td>
<td>4.6%</td>
<td>0.9%</td>
</tr>
</tbody>
</table>

There was an increase of percentage in responses of gamers who played rich and moderate in language games toward the perceived positive effect of digital games on EFL learning compared to the remaining sample of the overall participants. As shown in the table, the most notable
difference was in increased number of students who “strongly agree” and “agree” that playing digital games helps them in: learning new words (question 1, increase close to 12%); finding that learning English through digital games was interesting (question 3, increase more than 12%); feeling as if they are in an English-speaking country (question 9, increase nearly 28%); and learning listening, speaking, and reading skills (questions 11, 12 & 13: increase of 12–15% in the three questions). Accordingly, the number of neutral and negative answers to the above questions decreased among the students who played rich and moderate in language games as compared to the remaining sample of the overall participants.

5.1.2.3 Perceptions of players who interacted highly by speaking (IHS) while gaming.
Perceptions of participants who indicated that they interacted highly by speaking (IHS) while playing online games (N=204) showed notable difference in some questions compared to the remaining sample of the overall participants (N=175) as presented in Figure 5.6 and further detailed in Table 5.6 below. Figure 5.6 presents the questions with notable differences in percentage only; other questions with smaller differences can be found in the entire table of perceptions of players who interacted highly by speaking in relation to all questions (Appendix J).

![Figure 5.6 Perceptions of gamers who interacted highly by speaking (IHS) and the remaining sample of the overall participants: combined positive answers comparison.](image-url)
Detailed descriptive statistics of the comparison between participants who indicated that they interacted highly by speaking (IHS) while playing online games and the remaining sample of the overall participants are presented in Table 5.6.

Table 5.6 Comparison between participants who indicated that they interacted highly by speaking while playing online games (‘HIS’; N=204) and the remaining sample of the overall participants (‘All’; N=175).

<table>
<thead>
<tr>
<th>Question number</th>
<th>Questions</th>
<th>All</th>
<th>IHS</th>
<th>All</th>
<th>IHS</th>
<th>All</th>
<th>IHS</th>
<th>All</th>
<th>IHS</th>
<th>All</th>
<th>IHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 4</td>
<td>Digital games could be used to effectively teach a foreign language.</td>
<td>32.6%</td>
<td>42.2%</td>
<td>24.6%</td>
<td>34.3%</td>
<td>26.3%</td>
<td>20.1%</td>
<td>14.9%</td>
<td>9.8%</td>
<td>1.7%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Question 9</td>
<td>When gaming, I felt like I was in an English-speaking country</td>
<td>16.6%</td>
<td>31.4%</td>
<td>28.6%</td>
<td>43.6%</td>
<td>38.3%</td>
<td>20.1%</td>
<td>14.9%</td>
<td>4.4%</td>
<td>1.7%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Question 12</td>
<td>During playing digital games I learn English speaking skills</td>
<td>20.6%</td>
<td>46.1%</td>
<td>41.1%</td>
<td>41.2%</td>
<td>28.0%</td>
<td>9.8%</td>
<td>9.1%</td>
<td>2.9%</td>
<td>1.1%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

There was an increase of percentage toward the perceived positive effect of digital games on EFL learning compared to the remaining sample of the overall participants. The most notable difference was in increased number of students who “strongly agree” and “agree” that digital games could be possibly used in EFL teaching (question 4; increase close to 20%); and feeling as if they are in an English-speaking country (question 9, increase was 30%). Another notable and important difference was found that was related to online interaction by speaking. The difference was in question 12 that asked whether students learn English speaking skills while playing digital games (question 12). There was an increased number of students who “strongly agree” and “agree” in this question of almost 26%. Additionally, none of the participants in this group (0%) “strongly
disagree” on the question about learning speaking skills while gaming. Accordingly, the number of neutral and negative answers to questions 4, 9 and 12 (Table 5.6) decreased among participants who interacted highly by speaking while playing online games.

5.1.2.4 Perceptions of players who interacted highly by listening (IHL) while gaming.
Perceptions of participants who indicated that they interacted highly by listening (IHL) while playing online games (N=286) showed notable difference in some questions compared to the remaining sample of the overall participants (N=93) as presented in Figure 5.7 and further detailed in Table 5.7 below. Figure 5.7 presents the questions with notable differences in percentage only, other questions with smaller differences can be found in the entire table of perceptions of players who interacted highly by speaking in relation to all questions (Appendix K).

![Figure 5.7 Perceptions of gamers who interacted highly by listening (IHL) and the remaining sample of the overall participants: combined positive answers comparison.](image)

Detailed descriptive statistics of the comparison between participants who indicated that they interacted highly by listening while playing online games and the remaining sample of the overall participants are presented in Table 5.7.
Table 5.7 Comparison between participants who indicated that they interacted highly by listening while playing online games (‘IHL’; N=286) and the remaining sample of the overall participants (‘All’; N=93).

<table>
<thead>
<tr>
<th>Question number</th>
<th>Questions</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 1</td>
<td>I learn new words and expressions playing digital games.</td>
<td>26.9%</td>
<td>40.9%</td>
<td>24.7%</td>
<td>7.5%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Question 9</td>
<td>When gaming, I felt like I was in an English-speaking country</td>
<td>20.4%</td>
<td>22.6%</td>
<td>39.8%</td>
<td>15.1%</td>
<td>2.2%</td>
</tr>
<tr>
<td>Question 10</td>
<td>Playing digital games makes me want to learn English</td>
<td>30.1%</td>
<td>37.6%</td>
<td>24.7%</td>
<td>7.5%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Question 11</td>
<td>During playing digital games I learn English Listening skills</td>
<td>33.3%</td>
<td>35.5%</td>
<td>21.5%</td>
<td>7.5%</td>
<td>2.2%</td>
</tr>
<tr>
<td>Question 12</td>
<td>During playing digital games I learn English speaking skills</td>
<td>23.7%</td>
<td>33.3%</td>
<td>31.2%</td>
<td>10.8%</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

There was an increase of percentage toward the perceived positive effect of digital games on EFL learning compared to the remaining sample of the overall participants. The most notable difference was in increased number of students who “strongly agree” and “agree” that digital games positively affected learning English speaking skills (question 12); and feeling as if they are in an English-speaking country (question 9, increase more than 24% in both); and that playing digital games helps them in: learning new words (question 1); and that playing digital games motivated them to learn English (question 10, increase more than 20% in both). Another notable and important difference was found that was related to online interaction by listening. The
difference was in question 11 that asked whether students learn English listening skills while playing digital games (question 11). There was an increased number of students who “strongly agree” and “agree” in this question of almost 23%. Additionally, none of the participants in this group (IHL) 0% “strongly disagree” on the question about learning listening skills while gaming. Accordingly, the number of neutral and negative answers to questions 1, 9, 10 & 12 (Table 5.7) decreased among participants who interacted highly by listening while playing online games.

5.1.3 Summary of students’ perceptions captured by the questionnaire

This section of the chapter outlines results of the overall sample of students’ perceptions about the relationship between digital games and EFL learning and compares them with the perceptions of students who predominantly played rich in English language and communication games. This investigation of the students’ perceptions aims to add a meaningful understanding of the statistical findings in the previous chapter of correlational data (presented in Chapter 4).

The results of overall students’ perceptions showed a general trend toward the positive effect of digital games on the students’ EFL learning in relation to their motivation and achievements in specific English skills such as speaking, listening and reading. The analysis showed that overall students considered playing digital games as a helpful tool for their EFL learning. In addition, the overall students supported the idea of integrating digital games into teaching of EFL. However, students favoured the use of digital games as an “out of class” activity rather than as an “in-class” activity. Lastly, the majority of the students (more than 75%) perceived playing digital games as beneficial to their learning particular English skills such as listening, speaking, and reading.

The overview of the results relating to perceptions of students with rich language and communication game experiences showed increased percentages, compared to the remaining sample of overall participants, toward the perceived positive effect of digital games on EFL learning.

The analysis of results of students’ perceptions (overall and with rich in language and communication game experiences) supports the idea that particular types of digital games may have a positive effect on EFL learning. While the results of the statistical correlational tests presented in the last chapter showed that there was a significant correlation between SLA and several aspects of digital game playing (patterns of play, types of games, online social interaction),
the students’ perceptions provided a clear indication that there might be a causal relationship between playing digital games and English language learning. Therefore, the two sources of data, correlational tests and students’ perceptions, mutually pointed toward the potential positive effect of digital games on EFL learning.

In the next section of this chapter a more in-depth analysis of students’ perceptions is presented based on interviews with three groups of students. Then, an overall discussion of the chapter’s findings will be presented, which will bring together findings of perceptions captured by questionnaire and focus groups.

5.2 Focus groups findings

In this section, the findings of student focus groups (qualitative data) are presented. In line with the sequential explanatory mixed methods design of the study (Creswell, 2017), the analysis of the quantitative data aimed “to explain and interpret quantitative results” (p. 211) by talking to the participants about their perceptions and experiences with playing digital games and EFL learning. Therefore, student focus groups aimed to add a richer and deeper understanding of the findings.

The analysis of focus groups related to two research questions: 1) What are students’ perceptions of the potential of digital games to enhance their EFL learning? 2) What are students’ perceptions of the effect of digital games on their EFL learning? As detailed in the methodology Chapter, three focus groups were interviewed (each session of 25–30 minutes duration). For each focus group session, students were selected from the same classroom during breaktime of study hours at the ELC. Selecting students from the same classroom was to ensure that their focus group session suited their study timetables. Another reason was to ensure that the students were familiar with each other and provided a comfortable context for discussion.

Participants were asked several questions related to the two research questions and they were given time to elaborate and discuss related matters (full list of questions can be found in Appendix B). At the beginning of each focus group session, participants were asked about their experiences with playing digital games in English and how did they use English language while they played these games. This led to asking about the language difficulties they might have faced when playing digital games and how they dealt with such difficulties. Then, participants were asked about being in the digital world of play and whether it helped them or not when encountering language problems. The participants also were asked about their gaming preferences by inviting
them to identify what types of digital games they thought helped in EFL learning, and whether they played such games. Finally, participants were asked “If they were EFL teachers, would they use digital games as an EFL teaching tool or not, and how?” Focus group sessions concluded with asking participants whether they wanted to add anything or provide any further comments.

The focus group interviews were audio recorded and fully transcribed and translated, and then the transcribed data were grouped using NVivo in relation to the answers to the interview questions and any additional themes which emerged beyond the questions were identified. At the start of each focus group session participants told their first names, and for the transcription process each participant was assigned with a number and these numbers were noted in the transcripts where the voice of the participant was possible to identify.

The analysis of the focus groups is presented below. In section 2.1 students’ answers to the questions are summarised. The section is divided into six sub-sections based on the questions asked in the focus groups. Then, a summary of the focus groups findings is presented (section 2.2). The excerpts for each student are labelled with the focus group number (FG1, FG2 or FG3) and a participant number (P1, P2 etc.), where possible. Additionally, what differentiates focus group from other qualitative methods is the distinctive feature of interaction between study participants. Therefore, it is important to report both individual utterances and chains of exchanges between participants (Duggleby, 2005). To distinguish between the two excerpts of responses, double spacing before and after chains of exchanges between participants is used, while single spacing before and after individual utterances is used.

5.2.1 Focus groups answers to the interview questions

5.2.1.1 Question 1: While playing digital games, how do you feel when you face a word or expression you don’t understand? And what do you do?

Students from all three groups mostly were in agreement in their responses that they experienced difficulties with language while playing digital games, but they did not feel overwhelmed by these difficulties. Characteristic responses are presented below:

Actually, it is something which feels like normal. (FG1, P6)

Playing is fun, so you will be motivated to translate the things you don’t understand to play. (FG2, P6)
In the game, you will try things till you understand. In the game, you will not get in trouble for wrong choices. (FG2, P1)

If I don’t understand something in a game, I will just skip it. (FG3, P2)

If I could understand without translation, I will use my understanding, otherwise I will look up the word or expression. (FG1, P2)

An unknown word will drive him [a gamer] to look it up, understand its meaning, and use it several times. (FG3, P1)

If I am desperate and couldn’t understand the meaning, then I will go to Google translator. (FG3, P3)

The above quotes showed that digital games allow students/gamers to play and encounter difficulties in the target language with less concern about not understanding specific terms or expressions. This is due to the fun and non-stressful environment of these games. Additionally, students discussed alternative strategies to maintain playing and understanding the language when encountering such difficulties while gaming. Students proposed that proceeding with their play if possible (by skipping the unknown part) was one option. Otherwise, they would be highly motivated to search for meanings that will help them continue playing. Students explained that this helped in facilitating language comprehension as encountering language difficulties while gaming drove them to look up new words and expressions. In addition, some students found another way to help them playing while facing language difficulties that prevent them from proceeding in the game. This alternative option was watching explanatory videos (gameplay) in the target language. FG1, P6 stated, “I will look for a gameplay – someone streaming the game while he is playing to show gamers how to play – on YouTube which is mostly in English.”

5.2.1.2 Question 2: Do you think the digital world of the game helps you learning English, e.g. to get the meaning of new words and expressions (or not)? How?

Most of students from all three focus groups enthusiastically agreed that they have learned English words and expressions while playing digital games. Students claimed that they could understand unknown words and expressions through the context of their use, and some clues in the game, as exemplified below.

In the game, there is a video, a picture and movements that can help you understand. It is way different than reading a word in a blank paper. I can say that there are many words
that I learned and understood from playing digital games, like *Call of Duty* (PlayStation 4 game) and other games. (FG1, P6)

When you play a football game and there is the word “slide tackle”, when you perform the action you will know what “slide tackle” means. The same thing with “substitution, save, shot, pass, run”, all these words you might go through in the game screen or when you listen to the commentator. (FG3, P1)

Sometimes that character in the game will visualise\(^1\) the word for you and then you know the meaning by the reaction of the character in the game. (FG1, P4)

From the actions you performed you might be able to understand the word or expression. (FG3, P2)

Yes exactly, and from that action you did in the game you will understand the meaning and you will not ever forget it. It will stick. (FG3, P3)

Similar to what happens when you play *Uncharted* (PlayStation 4 game), there will be a word and a sign or an arrow that directs you somewhere which will give you an idea of the meaning of the word. (FG1, P5)

Students in the above quotes pointed out one of the important features of digital games which facilitated their English language comprehension. This feature is associating English words, sentences and expressions with moving pictures and videos which is under the control of students. They explained that the support of visual graphics in digital games played an important role in their English comprehension. Therefore, when encountering unknown English expressions in games, students can sometimes use the hints and moves of the game characters to understand. In addition to facilitating language comprehension, this feature can participate in retention of encountered language expressions by activating three language input means: reading texts, listening to words, and watching actions of game characters.

In addition, students related using English language to achieve gaming goals, as well as encountering language chunks and expressions frequently while gaming as also important factors in helping them learn English and understand new words and expressions.

It is fun and something I enjoy doing. To enjoy the game, I have to understand what is going on. (FG3, P3)

You will play a game many times, which will make you see these words and read them a lot and they will stick to your memory. (FG2, P2)

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\(^1\) Often in digital games there are hints for players which allow them to visualise the instruction, thus providing visual support to the text of the instruction.
In the game, there is a target you want to reach, and understanding this word will take you there. (FG1, P7)

Also, the repetition of the word in games makes it stick. (FG1, P3)

Students also referred to the entertainment and enjoyment aspects of digital games as facilitators of language learning. They argued that understanding the language contexts in digital games is easier than other means. Moreover, playing digital games for most of these students is an ongoing frequent activity, and this process of repetition of English language components seemed to improve English learning and enhance students’ motivation.

5.2.1.3 Question 3: What are you learning from playing digital games in general?
In addition to learning the meaning of English words and expressions in general, students across all the groups also mentioned some specific (English) skills that they felt they learnt from playing digital games. Characteristic examples are presented below.

Many things actually ... language learning in general, gaming skills, listening skills as well. (FG3, P6)

Most games have a subtitle feature at the bottom of the screen. So, you also read and read fast to keep track of what is going on. And this can improve your reading skills and enable you to be a fast reader. (FG3, P4)

Many online games allow you to interact with native English speakers. Therefore, when you interact with them you can improve your language in general and also you can improve your accent because you listen to the correct words’ pronunciation. (FG3, P2)

When you talk about learning English, online games are the best. Because sometimes you will interact with people that don’t speak your language. So, you need to speak with them in English. (FG2, P2)

In addition to gaming skills, students’ answers mostly related to learning English skills such as listening, speaking, correct pronunciation, and improving reading speed. Students claimed that the online interaction feature in some games allowed them to actively participate in conversations in English. Online interaction is essential in these games if players want to co-operate with other gamers around the world. Therefore, the participants felt that online interaction gradually improved their listening and speaking skills, as well as allowing them to listen to correct
pronunciations of words. Additionally, the subtitle features available in some games enabled students to read while listening to dialogues between characters in games which improved their reading and reading speed.

Students also considered that other generic skills (not language related) were stimulated by certain types of digital games (e.g. puzzles), as evident in the excerpts below.

Games that have puzzles and mysteries that you have to figure out will definitely make you think and try to solve these things. So, you will use your mind. (FG2, P1)

Some games are adventures and have story, that makes you live a story and take you away from your life. You will be the decision maker in the game, your decision will change the events of the game. (FG2, P2)

Adventure games that have puzzles stimulate your thinking. A lot. (FG2, P3)

Students believed that some puzzles and mysteries in digital games that they (as gamers) are required to complete can influence some generic skills including problem solving, thinking and decision-making. In addition, being the decision maker of the game seems to be an important feature in these games that presented students/gamers as active learners.

Although students mostly see games as a strong support for English learning, they pointed out that games often can provide them with colloquial English expressions and different English accents which although useful in everyday life is not always useful in an academic setting, as expressed in the excerpts below:

For me, I think that in online gaming you are learning slang. You are not learning grammar or how to speak properly. (FG1, P1)

Yes, that’s right. But not everyone in online games speak slang. Some of them speak proper English. (FG1, P6)

Some of the words they use [in conversation rooms] are slang. But you always can ask them about the meanings and most of them are really friendly and can explain it to you. (FG3, P2)

While the game characters are pronouncing the words, you can learn how to pronounce it correctly as well. (FG1, P2)
Many online games allow you to interact with native English speakers. Therefore, when you interact with them you can improve your language in general and also you can improve your accent because you listen to the correct words’ pronunciation. (FG3, P2)

This [online games] might allow students to recognise and differentiate between American, Australian, and British accents. (FG3, P3)

Most students pointed out that learning English accents and word pronunciations from games was a useful “add on” to their knowledge about the language. By interacting with different gamers around the world, these EFL students encountered different English accents and dialects. This introduced them to minor language variations such as British and American English pronunciations. On the other hand, these accents can be seen as confusing, especially in relation to their classroom language learning as stated by (FG2, P4): “some games give you certain words and you will understand them as they are in the game. But they use these words or pronounce them wrongly due to different accents. Another thing is that they sometimes use slang or short words, or expressions and I don’t know how to use them.” Online interaction can also familiarise EFL learners with colloquial “slang” expressions, which are highly unlikely to be encountered in any other context in a non-English speaking country.

5.2.1.4 Question 4: In relation to your own EFL learning, do you feel that digital games helped you to improve your English language? How?

The students offered a variety of answers to this important question and therefore the majority of those responses are included below either as individual utterances or chains of exchanges between the students. Most of the responses to this question expressed the students’ perceptions that games helped them in their EFL learning.

Personally, digital games really improved my language. In the past, I only knew the letters and few words. After playing digital games, I learned many words and expressions. I really learned a lot. (FG1, P3)

Honestly, games have really improved my language. Especially, that I had a teacher in Elementary school who also helped me as well. He actually told me to focus on language while playing these games and focus on vocabulary and grammar as well. (FG1, P7)

Students’ quotes above explained how digital games provided them with variety of vocabulary that expanded their vocabulary bank and also helped them in their EFL studies. They argued that
through digital games they were able to enrich their English language by increasing the amount of English words and expressions before officially studying the language. Students also pointed out that they became aware of how to increase their knowledge in English vocabulary and grammar with the support of English teachers at school. The teacher role was important in focusing students’ attention on learning the language of these games.

Students also discussed that playing digital games improved their communication skills and allowed them to actually practice the language they were learning in the classroom.

For me, games helped me with discussions and speaking. Honestly, when I travel, I used to understand when someone talks to me, but I can’t respond. I used to be afraid to make mistakes or something. However, when I play online, I interact with English speakers, and I am OK to talk with them, I am not that afraid like real life. (FG1, P5)

We are here [ELC] studying English, right? The question is, where can I practice the language I am studying now? If I go out, you will rarely find someone to speak English with, and practice. The other option is either go online and find a website to practice English or play PlayStation [for example, online gaming]. But, if I keep studying at school without practicing, it is difficult to keep the language you studied. (FG1, P6)

Games helped me using language and information that you already learned. We learned some English in high schools, and by using the language in games it sticks more. (FG2, P4)

One of the Reading classes that we study is talking about diseases, bacteria, and infections. All of these information and vocabulary I already knew from a game called The Last of Us. I didn’t even need to go back home and study the vocabulary and passage, because I already know the keywords. (FG1, P2)

In addition to enriching their vocabulary, students discussed how playing digital games and especially interaction with other gamers online allowed them to practice English. As EFL learners, the participants were aware of the limited possibilities of using English language outside of school and in casual social conversation. Therefore, students emphasized the importance of online gaming as one of the key activities that allowed them to practice English in EFL contexts. Moreover, students claimed that these experiences with digital games were transferred to their language education They suggested that digital games facilitated their English learning in the classroom as they were already familiar with some topics from playing games.

Additionally, some students stated that they were introduced to English via digital games even before they started studying it at school.
Personally, almost all the English I learned is from games and movies. In school I only learned Grammar, and basics like punctuations. However, all other skills I learned from digital games and movies, until today I learn through these two things. (FG3, P2)

The same thing here. Almost all the language I learned is from gaming and movies even before I study the language. (FG3, P5)

I personally started playing digital games when I was in level 4–5 in Elementary school [11–12 years old]. I played all types of consoles. And honestly since I started gaming, I started acquiring English even before I studied it at school. I was forced to learn English and look up words to play my favourite games. And I still go through the same thing until today and I am happy about my English now. (FG3, P3)

In the above quotes, some students stated that they were actually introduced to English, years before they started their English courses in schools or at the ELC. They attribute their initial knowledge of English (in their non-English speaking context) to digital games and movies. Students also expressed their pleasure and enthusiasm in discovering the language whilst playing their favourite digital games.

Finally, although the majority of views toward digital games and EFL learning were positive, there were two students (out of 18) who expressed negative views.

Actually, for me, games haven’t added anything to me regarding learning the language. The expressions that you have in games are different to the ones we need to study and we don’t use them a lot in the classroom. It is something different than studying. (FG2, P8)

English language in online gaming will not even teach you how to order something from a restaurant or so. (FG2, P1)

The two students in these last quotes contradicted the majority of views in the focus groups as they felt that digital games did not add to their English learning. They stated that the language used in digital games can be used in gaming settings only. The two students also agreed that English acquired from digital games cannot be transferred to English education environment or even daily social interactions.
5.2.1.5 *Question 5: What types of digital games do you think help in EFL learning? And which are not helpful?*

In relation to this question, students unambiguously suggested and predominantly expressed their clear agreement that adventure and story-mode games were very helpful in learning EFL. Characteristic answers are presented below as chains of exchanges between the students.

Adventure games can be very helpful regarding language learning. Like *Uncharted* and others. (FG1, P1)
I agree. Story mode games can really help in most games. (FG1, P2)

Adventure games in general that have [story mode]. (FG2, P5)
I believe that adventure games are the best because they are rich in English and they use difficult words. And because it has dialogues between characters. In addition, you need to focus and understand to be able to survive and finish the game. (FG2, P1)
Also, you will have to know and memorise the word because you know that you will encounter it later on in the game. (FG2, P6)

I think that action and adventure games especially those story-oriented games. (FG3, P1)
There are some games where you decide the storyline of the game, so you have to know what the character is saying to be able to choose your response. So, you can’t succeed in any of these games if you don’t have adequate English language. (FG3, P2)
I agree with you, there are many games that depend on your understanding of the story, like *Uncharted*, you have to understand the puzzle or mission you are about to do, or you will not proceed in the game. *Tomb Raider, Resident Evil* as well, all these games require a good language to play. (FG3, P3)
Adventure games have puzzles that you can’t continue playing unless you figured them out which require English to understand the puzzle. (FG3, P4)

*The Sims* [simulation game] can really improve your language. It gives you new vocabulary, and you live someone else’s life. (FG1, P3)

In the above responses of students from the three focus groups, it is noticeable that the majority agreed in considering adventure story-mode games (such as *Uncharted, Tomb Raider, and Resident Evil*) and simulation games (*the SIMs*) as the most beneficial to improve language learning in general. Students pointed out that these game genres include significant amounts of English which needs to be used and understood to achieve their purpose of advancing in the game.
In adventure and simulation games, the significant amount of English can be found as a form of dialogues between the game’s characters as well as written communications and notes in the game to complete certain tasks or missions.

In addition, and as mentioned in previous quotes, students stressed the feature of social online interaction available in online games and its role in improving English communication skills. As indicated in individual utterances or chains of exchanges below:

Online games can improve speaking. I also believe that online gaming can make you love learning English. (FG1, P5)

In online interaction you will have the courage to speak and use the language you have, because no one sees your face, no one knows your real name. So, even if you speak and make some mistakes it is OK. However, when I compare it to our presentations in Oral class, … presenting in front of a number of people, you don’t want to make mistakes because they are looking at you. On the other hand, in an online interaction I will not care, and I will try different spellings and try different pronunciations until I get it right. So, this will break the fear barrier. (FG2, P4)

Games actually break the fear barrier of using the language and makes it easier to use. When you interact with others online, you will not feel stressed and you will be able to speak freely. And you will use the words you have whether you pronounce them correctly or not. (FG2, P6)

Many students are shy or afraid of making mistakes when they talk face to face in English. But when it is through online it will be different even if they are both Saudis. That way this is a good idea which will break the ice and make even face to face English conversations easier and more relaxed. (FG3, P3)

In these quotes, students stated that online interaction with other gamers around the world allowed them to practice their English speaking and listening in a real-life context. They also argued that online interaction encouraged them to speak and communicate without being afraid of making mistakes. Students indicated that while communicating with peers/gamers online, their language mistakes are not signalled out for comment by other gamers. Therefore, they practiced the language in a safe environment. This safe environment encouraged students to be active users of the language and improved their communication skills.

Students compared using English in the safe environment of digital games to the formal classroom environment where their classmates are watching, and teachers are correcting their
mistakes. Practicing English in front of classmates and teachers seems to be considered as a challenging task by students. On the other hand, interacting with gamers online is more comfortable which may increase students’ confidence to interact in formal and social settings.

At the same time, students believed that there are certain types of digital games such as gun shooting, sport, and car racing games which are not beneficial to EFL learning. Some individual utterances across the groups are presented below.

Car racing games are the least helpful ones. (FG3, P1)

In shooter games I think anyone can play them without any problems. (FG3, P2)

I don’t think that I personally benefited from shooter games in English. Because all of your focus is to kill opponents in order to improve your ranking in the game. (FG3, P4)

I believe that sport games aren’t that helpful. (FG1, P1)

Actually, in FIFA you get used to playing the game and you don’t need to know what words mean. And even the match commentator is Arabic. (FG2, P3)

Students in the above quotes agreed that fast-paced digital games such as car racing, sport, and gun-shooting games had the lowest benefit for EFL. The reason behind this was that the entire focus of students/gamers is obvious (racing other cars, scoring goals to win, or killing opponents in shooting games). Additionally, students pointed out that some of these games can even have the option to select Arabic language for the game main menu and Arabic commentators for sport games.

5.2.1.6 Question 6: If you are an EFL teacher, would you use digital games to facilitate language learning?

In relation to the last question in focus groups, students’ responses were in favour of using digital games as an out-of-class extra activity, as evident in the excerpts below.

They will be time consuming. They are better to be as an extra thing at home, not at school. (FG2, P3)

Maybe we, as a class, specify time out of class to get in an online party [teacher and students]. And we decide that we will speak English only. Maybe we can play an online game as a group and we only interact in English. (FG2, P1)
I might use digital games for setting up homework. … [so, students who like playing] can go home and play their game for 2–3 hours and come with a list of new vocabulary that they learned from the game [write the word and its translation]. (FG2, P4)

If they are already playing games at home, ok, we might use that as an extra thing. (FG2, P4).

Most students agreed that digital games should be utilized as out-of-class activities for EFL learners. They suggested that involving homework tasks and assignments with activities related to digital games can combine the benefits of both in-class learning and recreational games. Students stated that playing digital games is a daily activity for most of them and linking their study tasks to this ongoing activity would encourage students to enthusiastically complete them. On the other hand, digital games are not preferred during class time (“Integrating these games in classrooms or curriculum, I feel that it is not a good idea” – FG2, P4). The reason for that choice was that students believe that digital games can take too much of the class time which might decrease the allocated time for their formal EFL learning. Another reason expressed by students was the difficulties in managing a full-sized classroom while involving all students in gaming tasks.

5.2.2 Summary of students’ perceptions captured by focus groups

To sum up, this section of the chapter captured students’ perceptions about the effect of digital games on EFL learning by presenting and analysing the findings of three focus groups. Overall, the analysis of the results of the focus group sessions revealed strong support among the majority of the participants for the positive impact of digital games on their EFL learning. Most of the participants’ answers proposed that adventure, role-playing, and simulation games were beneficial for EFL learning in general, and that games with online interactive features can be helpful for improving communication skills and practicing English. This confirmed the major findings of the study in the students’ perceptions captured by the questionnaire as well as in the correlational analysis study: that there is a clear connection between playing particular types of games and EFL learning. However, the focus groups also allowed for further exploration of the complexity of EFL learning through digital games, by adding a richer texture to what was found through the questionnaire. While the focus groups confirmed the findings that playing games improved students’ reading skills, they also specified that it improved their ability to read quickly, particularly when the subtitle feature is on. The students also stated that when they encountered
some unknown words and expressions during play they did not feel overwhelmed by these
difficulties because they were easy to overcome compared to similar situations in class. They
explained this by their desire to keep going with their play which made their learning feel seamless
as they were highly motivated to find the meaning of these unknown words and expressions. The
students described learning EFL through digital games as easy and enjoyable due to the
entertainment and fun aspects of these games. In addition, students discussed that they use English
language when playing digital games to achieve their gaming goals, which reinforces the indirect
and incidental language learning process which occurs while playing these games.

In relation to listening and speaking, focus groups confirmed that playing games allowed
students to improve these skills; however, they also revealed additional advantages such as
improving pronunciation and their accent. On the other hand, some students pointed out that digital
games provided them with colloquial English which can be used in everyday social occasions but
not in an academic setting. Similarly, some students appreciated the variety of accents and dialects
in digital games as useful “add-ons” while others perceived them as confusing.

The focus group data clearly indicated that digital games helped the students in their EFL
learning. Some of them emphasised that digital games mainly support communication skills when
engaging in social conversations in everyday life. Some students mentioned that this skill can be
transferred to the educational context. Other students who have engaged with digital games for a
lengthy period of time shared that gaming introduced them to English language before they
commenced their formal EFL study and they learnt quite a few words and expressions from playing
games.

When asked about the types of digital games in relation to EFL learning, students clearly
identified “story-mode” games such as adventure, role playing, and simulation games, as the most
helpful in EFL learning. In addition, students expressed their opinion that communication skills in
English (either oral or written) can be improved through online gaming as it provides social
interaction with other English-speaking gamers. Students also identified certain types of action
games (sport and car race games) as not useful in EFL learning due to their minimal use of English.
Finally, despite the fact that students perceived digital games as a great support for EFL, they
favoured the use of digital games as an out-of-class extra activity. Students claimed that using
digital games in-class would be time consuming and difficult to administer.
5.3 Discussion of overall students’ perceptions: bringing the findings from the questionnaire and focus groups together

This section of the chapter provides a discussion of the overall findings about the students’ perceptions which brings together the data from the questionnaire and focus groups. It identifies which findings from the questionnaire were confirmed and extended in the focus groups (sections 3.1–3.3), and what new knowledge and understanding emerged beyond the answers to the questionnaire and the focus groups questions. Focus group sessions provided an enriched understanding of the students’ perceptions by complementing the information captured by the questionnaire as they allowed the students to extend, elaborate and discuss their point of view in detail. It is important to note that in this section the students’ perceptions of the rich in language and communication games only are mostly discussed. This is because the participants’ perceptions are different in relation to the games that provide rich in English language and interaction experiences, and games that do not offer such qualities. Therefore, when the term ‘digital games’ in this section is used, it refers to the games that are rich in English language and interaction only. However, when digital games that are low in language exposure or communications are discussed, they are specified as “low in language or interaction games”.

Overall, the findings from focus groups were consistent with what have been found in the questionnaire. These were collated and discussed under three major themes: 1) the effect of digital games on EFL learning, 2) digital games and various English language skills, and 3) digital games and motivation to EFL learning (represented in sections 3.1–3.3 respectively). These three themes emerged from the combination of the findings from the questionnaire and focus groups as well as the research literature which was the basis of the design of the questionnaire (as detailed in the Methodology Chapter). Additionally, from the analysis of the focus groups, two new additional themes emerged which did not come from the questionnaire or questions asked during focus group sessions but were strongly expressed by students: 1) learning in a safe environment, and 2) exposure to various versions of English expressions and accents. These are summarised and discussed in section 3.4 as additional themes.

5.3.1 The effects of rich in English language digital games on EFL learning

Students’ perceptions pointed toward their general view of digital games as an effective EFL learning tool. According to the analysis of students’ perceptions in the focus groups, this major
theme included two interconnected sub-themes that recognise a reciprocal effect between digital games and EFL learning: 1) digital games as EFL learning tool, and 2) English language as a tool for playing digital games.

5.3.1.1 Digital games as EFL learning tool.
This theme focuses on how students perceived and discussed digital games as a tool in order to learn and enrich their English language. Most participants in both the questionnaire and focus groups agreed that their EFL learning benefited from playing digital games.

Importantly, the majority of focus group participants’ perceptions confirmed one of the key findings from the correlational part of the questionnaire, which indicated that only specific types of digital games were perceived as having a beneficial impact on EFL learning. Similar to the findings of the correlational tests, focus group participants considered adventure games and role-playing games (identified in this study as rich in English language games) as the most beneficial digital games for EFL learning. Therefore, the findings from the focus groups confirmed what had been found earlier in the correlational test results (Chapter 4) that playing rich in language games has a significant impact on EFL language learning. It is important to note that the explicit question about the type of games the students think is more beneficial for language learning was not asked in the students’ perceptions part of the questionnaire intentionally, to avoid leading students’ answers by such a direct question. The aim of asking the question in focus groups was to implicitly capture students’ ideas without providing them with a list of certain types of games. In addition, focus group sessions were conducted two months after the completion of the questionnaires. The two-month delay was used to minimise any effect on students’ perceptions from the questions asked in the correlational part of the questionnaire.

The participants considered the plots, the scenarios and the visual, sound and animation effects in digital games (known as the “digital world” – Tyner, 2014) as an important facilitator of understanding and practicing English. Focus groups participants supported these views from their personal experiences of using English language in playing digital games as being helpful in improving their English skills (“In the game, there is a video, a picture and movements that can help you understand”; “Sometimes that character in the game will visualise the word for you and then you know the meaning by the reaction of the character in the game”; “I remember that one of the first words I learned in English were ‘left and right’. I learned these words from the football
game in PlayStation”). This finding confirms and supports what has been found in the literature that the digital world in digital games plays an important role in facilitating language learning and that digital games are considered to be an important provider of authentic language learning (Reinders & Wattana, 2015; Fallata, 2013).

In spite of finding games a useful EFL learning tool, the majority of the questionnaire participants (nearly 70% of answers) indicated that digital games would be more beneficial if they were implemented outside of the classroom rather than as an in-class activity. Focus groups participants expressed similar views indicating that issues related to duration of playing digital games and students’ supervision in the classroom would make it difficult using games during English lessons. In the research literature, there is still no agreement as to the efficacy of employing digital games in the EFL classroom. For example, perceptions of EFL learners in the Reinders and Wattana (2015) study, which used an off-the-shelf massive multiplayer online role-playing game called 

\textit{Ragnarok Online}, showed that digital games in language learning was preferable as an in-class activity and it could be incorporated as part of the English course. On the other hand, teacher’s perceptions in the Mahmoud and Tanni (2014) study claimed that only educational digital games can be an effective way to energise EFL learners and provide language learning with enjoyment in the classroom. Another study by Hitosugi, Schmidt, & Hayashi (2014) examined the impact of integrating a commercial-off-the-shelf (COTS) digital game (called Food Force) in a Japanese EFL classroom. The study found that there was a positive effect from integrating the COTS digital game on EFL learners’ vocabulary retention. The study also found that students preferred ‘in-class’ digital-games-based language learning over conventional language learning. However, an opposing perspective was found in this study, which considered digital games and especially COTS games more beneficial as an out-of-class extra activity to also avoid any issues related to utilising digital games as an in-class activity.

5.3.1.2 English language as a tool for playing digital games.

The previous theme presented how digital games assist learning EFL, and the focus was on digital games and their characteristics as language learning tools. However, in the focus groups the students often talked about how language was used to assist them when playing digital games, thus language became a tool to a successful progression in the game as well as being a pleasant and enjoyable experience. Students expressed that they mainly focussed on playing the game and
achieving the gaming goals. Therefore, they needed to know and understand what was happening in the game and what they needed to do to succeed which stimulated them to learn unfamiliar words and expressions.

Students discussed that (“you need to focus and understand to be able to survive and finish the game”; and “you will have to know and memorise the word because you know that you will encounter it later on the game”). In this case, while their main attention was on the game, students incidentally acquired and learnt English – the language of the game. Sometimes the meaning of unknown words and expressions could be understood from the context, but if the context did not support understanding then students found alternative means to understand such as using dictionaries or searching unknown expressions on the web. Using the language as a tool to reach success in playing digital games contributed to improving EFL learning. It was used constantly, and it was continuously reinforced incidentally. Therefore, the process of learning the language in this context was perceived as effortless as students (while gaming) were using the language as a tool to achieve their aim of being successful gamers.

The findings of this theme captured in the focus groups were in agreement with informal and incidental learning theory (Marsick & Watkins, 1990) that underpins this study. Marsick and Watkins (2001) argued that “informal and incidental learning take place wherever people have the need, motivation, and opportunity for learning” (p. 28). Therefore, the need to achieve successful gaming experiences motivated students to understand and learn English language whilst playing. This incidental and unintended language learning was regarded by the student participants as a beneficial addition to the language they learnt formally in the classroom. When students used the language as a tool to reach the gaming goals, incidental language learning occurred seamlessly and effectively, and did not become a burden.

According to Muñoz, Cadierno and Casas (2018), incidental learning is believed to “involve implicit learning processes (which take place without any awareness on the part of the learner) and/or explicit learning processes (which take place without learning intention but involve awareness)” (p. 1080). In regard to gaming, Turgut and Irgin (2009) argue that digital games allow gamers to incidentally use vocabulary encountered in the game for their own reasons. Turgut and Irgin (2009) claim that the games also allow gamers to use these vocabularies in complex, enjoyable ways, that contribute to improving language learning.
Exposure to English language during gaming can be valuable for EFL learners regardless of their intention to benefit from these experiences or not. This specific finding adds an interesting aspect to the body of literature on the relationship between digital games and EFL learning. It indicates that learning EFL through digital games might be a two-sided process, first by directly receiving the learning of the target language while playing, and second by being driven through digital games to use the language as a tool for play.

While the analysis of the questionnaire through correlational tests and thematic analysis of students’ perceptions indicated the potential positive effect of digital games on EFL learning, the analysis of the focus groups data indicates that the relationship between digital games playing and EFL learning can be analysed beyond simple cause-effect dichotomy. Therefore, such relationship can be theorised as more complex, not one-directional but a reciprocal, two-way interaction which evolves over time. As a result, the benefits of digital games playing for EFL learning can be increasing over the time of playing. In other words, the more EFL learners learn English the more complex-in-language games become accessible for them, which increases their participation in discussions (in English) in associated chat rooms. In turn, this process allows students to learn English at a more sophisticated level.

5.3.2 Digital games and various English skills

One of the major findings in this study was that digital games affected the four fundamental English language skills (Listening, Speaking, Writing and Reading). It is important to note that these language skills are valued in the EFL formal learning as they are fundamental in the assessment of EFL achievements in any EFL/ESL teaching contexts (Oxford, 2001). This indicates the value of learning through digital games for formal learning in students’ views as well.

Specifically, it was found that different types of digital games affected various English language skills in different ways: listening, speaking and writing were perceived as being affected by games rich in online interaction, while reading skills were mostly affected by rich in language games only.

5.3.2.1 Online interaction games and listening, speaking and writing English skills.
The findings from students’ perceptions in both questionnaire and focus groups indicated that gamers’ interaction in online gaming might be an important factor that influences EFL learning
process in general and English communicative skills in particular, such as listening, speaking and writing, but not reading.

According to the majority of participants (more than 80% in the questionnaire), it is digital games with rich online interactions that can improve English Listening, Speaking, and Writing. Similarly, the findings from the focus groups confirmed the students’ perceptions from the questionnaire, that certain types of digital games can improve these EFL skills.

In the focus groups participants elaborated on this point and added important details suggesting that digital games with an ‘online interaction feature’ have the potential to improve ‘communication skills’ in English. They indicated that verbal interaction during online gaming played a crucial role in this process. This feature of online social interaction available in some digital games allowed EFL learners to practice the language individually with co-gamers and learn from such interaction.

These findings are in line with sociocultural theory (SCT) which informed this study, and which emphasises that language is acquired in social interactions (Vygotsky, 1986). According to the SCT preceptive, involvement in social activities in ELF/ESL contexts including interaction with others and receiving artefacts that others produced (such as written texts) are essential in Second Language Acquisition (Lantolf, 2000).

Literature on digital games with social interaction features found that these types of games are perceived by students as motivating and encouraging their communication and collaboration when used during English lessons (Reinders & Wattana, 2015; Anyaegbu, Ting & Li, 2012; Peterson, 2012). The study of Reinders & Wattana (2015) found that EFL learners considered using digital games that allow online interaction to foster their willingness to communicate in the target language (Reinders & Wattana, 2015). Similarly, educational games with online interaction such as Mingoville promote collaboration among students (Anyaegbu, Ting & Li, 2012).

Peterson’s (2012) experimental study revealed that integrating massive multiplayer online role-playing games (MMORPG) in an EFL classroom is perceived by EFL learners as motivating due to the peer interaction nature of the games.

In addition to promoting EFL learners’ willingness to communicate, some studies investigated the specific impact of online social interactions in digital games on enhancing particular English skills. Suh, S. Kim and N. Kim (2010) conducted an experimental study on two groups of EFL learners. The treatment group enrolled in MMORPG-based interaction and the
control group attended regular face-to-face classroom instruction. The study found that EFL students in MMORPG-based interaction groups scored higher in listening, reading, and writing tasks than EFL students in the control group. Another study by Sylvén and Sundqvist (2012) was conducted on EFL Swedish learners. The study found that frequent MMORPG gamers had higher total mean grades in listening and reading comprehension than moderate and non-gamers in an English national test. The study also found the same results in regard to vocabulary mean grades among the three groups. A third study (Lai & Wen, 2012) examined an online game for promoting English speaking abilities among EFL learners. Findings of the study proposed that the environment of the online game (Talking Island) allowed gamers to “speak a loud the word or sentence in English for carrying out their mission individually or cooperatively” (p. 615). Lai and Wen (2012) claimed that this kind of environment can lower speaking anxiety and foster motivation and confidence in speaking EFL.

Most of the above studies, however, were conducted inside the EFL/ESL classroom. Therefore, activities that required students to be involved in online social interactions while gaming were part of the class time. This was different for this research study which was focused mainly on digital games as an out of class activity during students’ leisure time. This study demonstrated that English speaking, listening, and writing skills (but not reading) were perceived to be affected by communication via online interactions during EFL learners’ leisure time. Additionally, this finding is supported by statistical results from the correlational part of the study, indicating a strong connection between playing digital games with social online interaction features and higher language achievements (SLA) in these three particular language skills (speaking, listening, and writing). The difference in findings between this study and the other presented studies might be related to the study contexts, design and methodology. Although the other studies mostly used COTS games, they were chosen carefully by the educators (researchers) to suit their in-class language learning interventions for the purposes of these studies. Additionally, in the other studies the use of COTS games in the class was complemented by other educational tasks targeted at different English skills, mostly “reading, listening and writing” (Suh, Kim & Kim, 2010, p. 372).
5.3.2.2 *Rich in language digital games and English reading skill.*

Unlike English listening, speaking and writing skills, digital games with online social interaction features appear to be not as effective for English reading skills according to the findings of this study.

The analysis of students’ perceptions in the questionnaire indicated that improving students’ English reading skills was related to playing rich in language digital games (such as adventure, role-playing and simulation games). The participants in the focus groups expressed similar opinions to this finding, elaborating that when the ‘subtitle’ feature in these games is enabled, it could contribute to improving reading while gaming. Focus groups participants detailed that rich in language games include prolonged dialogues between the characters, therefore turning the subtitle feature on allowed the gamers to practice reading while listening to these dialogues. This process can potentially influence English reading speed and comprehension.

The finding of the importance of subtitle feature in rich in language digital games in this study resonated with the study of Chen et al. (2012) which discussed the topic from EFL teachers’ perspectives. The participants in their study, pre-service EFL teachers, argued that adventure games have potential to benefit EFL learning through subtitles. According to these participants, “game-based learning can help EFL students incidentally learn new vocabulary items while they listened to the dialogues and/or read the subtitles” (p. 128). However, an opposite perception from the perspective of EFL learners was presented in another study (Chen & Yang, 2013). The study of Chen and Yang (2013) indicated that EFL learners were overwhelmed and complained about the fleeting subtitles and dialogues of the game. They suggested that having control over the subtitles would be helpful.

The difference in perceptions between participants in the abovementioned studies as well as participants in this study might be due to the specific games used in those studies, such as the ability of players to turn the subtitles on or off. Overall, participants both in this study (EFL learners) and in the Chen et al. (2012) study (EFL teachers) indicated that subtitles are useful features for rich in language games. Obviously, subtitles can be overwhelming, as for participants in Chen and Yang’s (2013) study, if they cannot be controlled. Additionally, difference in initial English language proficiency among participants in different studies might have also played a role.

To sum up, the findings of this study support the indication that games which include rich exposure to English language can be beneficial to EFL reading skills. In particular, listening to
conversations between the characters in the games simultaneously supported by subtitles of the dialogues can maximise reading skills by providing two language inputs: ‘reading while listening’. However, it is important that the players can control the appearance of subtitles and being able to pause and rewind the game for better comprehension of the meaning.

5.3.3 The impact of digital games on motivation in EFL learning

As a result of the majority of students discussing motivation in the focus groups, the topic of motivation was identified as one of the major themes in students’ perceptions of digital gaming in relation to EFL learning. The students indicated that while playing digital games they were mostly motivated by the enjoyment and fun of play. At the same time, the games provided them with an environment that motivated them to learn English (“Playing is fun, so you will be motivated to translate the things you don’t understand to play”) and created positive feelings about English learning (digital games “make you love learning English”).

Similarly, the majority of participants in the questionnaire who played digital games with rich in language and communication experiences agreed that playing digital games motivated them to learn EFL as well as to practice and use the language. In addition, more than 65% of those respondents believed that digital games provided an authentic environment for learning English similar to actually being in an English-speaking country. Focus groups participants also discussed similar points that relate to being in an English-speaking country. They mentioned that playing rich in language games was like living another life within the story of the game (“it is similar to living in a story with the ability to play and make the decisions”), and that English language in these games is as authentic as in an English-speaking country (“in online, they speak informal English, and when you go to an English-speaking country like USA, they will not speak formal English … in everyday life”). This is seen as motivating for students to play and learn informal use of the language in addition to the formal use learned in the classroom.

Various studies have focused on the motivational aspect of digital games in EFL learning. Reinders and Wattana (2015) conducted interviews with EFL learners after a 15-week game-based language learning course. The participants stated that integrating online digital games in the EFL classroom increased their motivation to communicate in English. An exploratory study by Wu et al. (2014) explored motivations in playing a massive multiplayer online role-playing game (MMORPG) to support communicative use of English language. Wu et al. (2014) conducted a motivational survey and found that socializing, relationship, and teamwork features of MMORPG
facilitated the use of English for communication. Another study by Rankin et al. (2006) investigated the use of MMORPG for ESL learning among beginner, intermediate and advanced ESL students. After four weeks of game-play sessions (4 hours a week), the results of participants’ questionnaires and interviews showed that “MMORPGs can provide motivation and adequate language learning support for intermediate and advanced ESL students” (Rankin, et al., 2006, p. 33). Finally, EFL teachers’ views in the Chen et al. (2012) study on using adventure digital games for EFL learning revealed a positive attitude toward digital games and identified that games could be motivating instruments for EFL learning.

These previous studies directly investigated the motivational aspect of digital games on language learning by either interviewing or asking EFL students and teachers about motivation. In our study, focus group participant were not asked (directly or indirectly) about motivation of EFL learning through playing digital games. However, a strong trend in the findings relating to students’ perceptions indicated that playing digital games motivated them personally to learn English. In addition, it was indicated that because playing digital games is a highly motivating activity, students were driven to learn the language of these games to be able to play and achieve high levels in gaming. Learning new vocabulary and expressions from digital games was also perceived by students as enriching to their knowledge of English language beyond what is offered in the formal EFL classroom.

5.3.4 The additional themes emerged from focus groups

Focus group sessions allowed the students to bring up some new points about their EFL learning in gaming which went beyond the scope of the questionnaire and the questions asked during the focus groups. These ideas were analysed thematically and are presented below as two main additional themes related to the advantages of gaming to EFL: “Learning EFL in a safe environment” and “Exposure to various versions of English expressions and accents”.

5.3.4.1 Additional theme 1: Learning in a safe environment.

Learning EFL in a safe environment was one of the additional themes that emerged during focus group discussions. The students in the focus groups agreed that online gaming allowed them to practice speaking English with other gamers in an informal and safe environment where mistakes are tolerated (“in online interaction you will have the courage to speak … even if you speak and
make some mistakes it is OK”). In the informal and safe environment of gaming, EFL students are seen as anonymous gamers (“in online interaction you will have the courage to speak because no one sees your face, and no one knows your real name”) where they can make mistakes and learn from others without feeling uncomfortable or embarrassed (“When you interact with others online, you will not feel stressed and you will be able to speak freely”). Most importantly, they will practice English without their mistakes being marked as in the classroom (“in Oral class, presenting in front of a number of people you don’t want to make mistakes because they are looking at you. On the other hand, in an online interaction I will not care, and I will try … until I get it right”), which (“breaks the fear barrier of using the language and makes it easier to use”).

There are a number of studies which have also presented findings about the safe learning environment that can be provided in the context of game playing. Reinders and Wattana (2015) interviews found that integrating digital games in the EFL offered a safe environment for EFL students to communicate; they also found that there was a reduction in anxiety and an increased willingness to communicate using English language. The findings of the focus groups in this study reported that playing digital games provided EFL students with a safe environment to practice the language. Also, there were strong indications that the interaction in English in this safe environment may positively effect students’ language and therefore improve their EFL learning. Alternative findings were discussed in a study by Peterson (2012) which investigated the integration of MMORPG in EFL. This researcher reported that beginner-level EFL students found that the MMORPG environment was overwhelming and they “experienced cognitive overload” (p. 72). A third study (Anyaegbu et.al., 2012) discussed an idea relating to the provision of a safe learning environment of digital games. The participants of this study preferred using educational digital games with online interaction: “the majority of the students revealed that they prefer using games because they have to learn on their own and avoid losing face and scared of teachers” (Anyaegbu et.al., 2012, p. 159).

The viewpoints of the focus group students in this study clearly stated that digital games can provide a safe learning environment to learn English. According to the findings of this study, EFL learning is evident when participating in non-educational digital games during students’ own time (at their homes). This process is seen as a transferable skill which can contribute to students’ confidence in using English in social and formal settings. It also can positively affect students’
ability to use the language regularly and improve their skills in communicating in English language.

5.3.4.2 Additional theme 2: Exposure to various versions of English expressions and accents.

The other additional theme that emerged was that digital games exposed students to a variety of English expressions and accents. Students indicated that digital games mostly use colloquial “slang” English either in dialogues between the games’ characters or while interacting with other gamers online. This allowed the students to practice and learn “an everyday language” outside of the classroom context. Some students thought that the exposure to colloquial English might interfere with their learning and practicing of standard or academic English and therefore would impact on their success in their studies.

Some studies have considered the impact of exposure to various colloquial English expressions and accents through using COTS adventure digital games as part of the EFL classroom. For example, Chen and Huang (2010) conducted an experimental study to examine the potential of using COTS adventure games in the EFL classroom. The participants reported their perceptions about the game by indicating “that the rich vocabulary, different speech styles and the great amount of colloquial daily language in dialogues could train their listening ability, expand vocabulary size and familiarise them with American pop culture” (p. 136). Another study by Chen and Yang (2012) investigated learners’ perceptions on the impact of a COTS adventure game (BONE) for EFL learning. The findings from the perceptions survey indicated that this adventure game could provide learners with an authentic English environment that improved their listening. However, only 4 out of 35 participants who answered the survey reported that one of the benefits in the game was acquiring colloquial usages of English.

The participants in our study differentiated between learning English in the classroom and outside of the classroom. They considered these two methods of learning English as being quite separate and as having different benefits. They appreciated the benefits of learning formal English within the classroom, and the benefits of learning more informal English outside of the classroom using digital games. Learning both academic/formal and informal English from these two different venues could be seen as a balanced approach where the two forms of learning provide EFL learners with broader knowledge of the target language.
Another related point which was discussed during the focus group sessions was that interacting with different people around the world in the context of online gaming introduced participants to different English accents and dialects. However, the participants’ views varied in regard to this issue. While some participants considered that they became familiar with the diversity of the target language by encountering different accents and dialects of English, other participants reflected that as beginners in language learning they should not be introduced to such complexity. However, exposure to a variety of language usages such as different accents can be seen as an additional and important aspect in EFL learning. This could not be learned in classrooms or other formal settings. In addition, exposure to variety of language usages could have an effect on EFL students’ achievements as discussed by Al Murshidi (2014). In Al Murshidi’s (2014) study about difficulties that face Saudi and Emirati students in the USA while socialising, it is argued that “informal, casually made remarks, the use of slang and euphemisms, and a lack of English proficiency reduce socio-academic acclimatization, and international students often miss vital information” (p. 88). Saudi and Emirati participants in Al Murshidi study (2014) argued that linguistic difficulties such as not understanding some American accents and dialects not only left them out of conversations, but also prevented them from participating in class.

Therefore, the language that digital games provide to EFL learners can improve and expand their understanding of the target language as well as the culture where the language is used. In addition, the environment of digital games where language is naturally used allows EFL learners to practice the target language, improve their communication skills, and increase their understanding of the social contexts of the target language. This knowledge can potentially contribute in raising EFL students’ motivation, willingness and readiness to participate in “everyday” social communications, thus in-classroom participation as well.

5.4 Chapter summary and conclusion

In line with the sequential explanatory mixed methods design of the study, after the discussion of quantitative results of the study, the findings and discussion of students’ perceptions were presented in this chapter. The chapter discussed perceptions of the overall sample of participants and perceptions of participants with rich in language game experiences, obtained from the questionnaire in the form of Likert scale questions. Next, the findings of three student focus groups which represent the qualitative data in this study were presented.
The questionnaire results of the overall sample of the students’ perceptions showed a general trend toward the perceived positive effect of digital games on EFL learning, motivation, and specific skills of English. The data showed that participants generally considered playing digital games as a useful tool in learning EFL. In addition, students favoured the use of digital games as an ‘out-of-class’ rather than ‘in-class’ activity. Lastly, most of the students perceived playing digital games as a positive impact on their English listening, speaking, and reading skills.

The results of perceptions of participants with rich in language game experiences only showed an enhanced trend toward the perceived positive effects of digital games on EFL learning. There was a notable increase of percentages of positive responses compared to the overall remaining sample. Increases were found in four groups: 1) participants who indicated they played rich in language games only, 2) participants who indicated they played both rich and moderate in language games altogether, 3) participants who indicated that they interacted highly by speaking while playing online games, and 4) participants who indicated that they interacted highly by listening while playing online games. These four groups had stronger positive perceptions about the usefulness of digital games in EFL learning in comparison to the perceptions of the rest of the overall sample.

Focus group sessions also showed students’ perceptions of digital games as having a positive effect on EFL learning, especially games that were considered as rich in language or communication. In the focus groups, students discussed how challenging playing digital games in English could be, and how they overcome language difficulties encountered while playing digital games. Students reflected on the assistance that was gained from immersion in the digital worlds (represented by the game’s characters, pictures, sounds and emotions of digital games) in understanding the language of the games. They believed that assistance from the digital worlds of these games enriched their EFL learning and helped them to play and succeed in the games. Students then discussed that they perceived digital games as a useful tool for improving certain English skills such as speaking, listening, and reading. They reiterated that adventure and role-playing (classified in the study as rich in language) games are the most helpful for EFL learning in general, and that games with online interaction features can be a great support for their communication skills in English such as speaking and listening. Students also believed that digital games would be more beneficial as an ‘out-of-class’ activity due to time restriction and classroom
management issues. In addition, students from different focus group sessions argued that online interaction is an effective tool that encouraged them as EFL learners to use and practice English.

Students in focus groups elaborated and provided further details about EFL learning and digital games which were in addition to the findings that were derived from the questionnaire and focus groups’ questions (additional themes). Students discussed that digital games provided them with a safe environment to practice English language. They argued that in the environment of digital games they can use the language naturally without stress or being concerned about making mistakes. This safe environment influenced their confidence in learning and using the language in different contexts in a positive way. Students in the focus groups also discussed how communication in digital games (online interaction or in-game dialogues) mostly use colloquial English slang more than standard or academic English. In relation to communicative features of some games, they noted that different games and interaction with different gamers (online) allowed them to encounter a variety of English accents and usages. These two viewpoints were perceived as beneficial “add-ons” that can broaden students’ knowledge about English language and its different contexts of use. This knowledge is effective for students in distinguishing between the different usages of informal and formal English expressions, vocabularies, and other language components.

The perceptions from the focus groups allowed us to further understand the possible positive impact of digital games on EFL learning from current EFL learners as they shared their lived experiences and their reflections upon them. The focus group findings confirmed and supported the findings in the questionnaire, particularly the finding that digital games motivated students to study EFL and positively affected their EFL achievements, especially in communication skills. The focus group findings also showed that communication skills (Listening and Speaking) can be improved specifically via games with online interaction features, and that Reading skills can be improved when activating the subtitled dialogues between games’ characters. Findings from the focus groups also supported the students’ perceptions captured by the questionnaire about whether games are more effective within the classroom or as an extra-curriculum activity and the rationales for this finding. Specifically, the findings from the focus groups clarified that time restrictions and classroom administration issues, such as controlling students’ play time and integrating digital games in an overcrowded classroom, make the use of digital games “in-class” distracting and therefore ineffective. Finally, focus group discussions
reinforced the interconnected idea that: 1) digital games can be an effective EFL learning tool; and that 2) learning English can also be a tool to successfully achieve the goals of these digital games. The use of English language to achieve gaming goals of rich in language games allowed the participants to learn the target language without intentionally focusing on it. This finding indicated that the process of indirect and incidental language learning can occur while playing digital games.
CHAPTER 6: SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter brings together the quantitative and qualitative findings to answer the research questions of this study which aimed to investigate the relationship between EFL students’ language achievement and playing digital games at a tertiary institution in Saudi Arabia. The chapter presents the key findings of the overall study by drawing on correlational analysis, and the students’ perceptions captured via questionnaires and focus groups. The findings are presented under the research questions. The limitations of the study and suggestions for future research are outlined. Finally, practical recommendations for EFL teachers, learners and institutions on using digital games in EFL teaching and learning are outlined.

6.1 Summary of study findings

The general aim of this study was to investigate the relationship between playing digital games as part of students’ leisure activities and their EFL achievement level. To understand the relationship between these two variables, the study focused on non-educational, commercial-of-the-shelf (COTS) digital games and students playing practices and habits. The study was divided into two main parts. The first part of the study aimed to answer the following research question and its sub-questions:

1. To what extent does playing digital games relate to students’ language achievement (SLA) in English for tertiary students?
   Sub-questions:
   a) How do students’ patterns of playing digital games relate to students’ language achievement?
   b) How does the type of digital games played relate to students’ language achievement?
   c) How does engaging in online social interaction in English whilst playing digital games relate to students’ language achievement?

The second part of the study aimed to answer the second and third research questions:

2. What are the students’ perceptions of the potential of the digital games to enhance their EFL learning?
3. What are students’ perceptions of the effect of digital games on their EFL learning?
6.1.1 Research Question 1, sub-question 1

This section answers the third sub-question: How do students’ patterns of playing digital games relate to students’ language achievement?

This study found a statistically significant relationship between students’ language achievement (SLA) and the years of exposure to (playing) digital games. Overall, the students who indicated in the questionnaire that they had been playing digital games for more than four years had higher levels of SLA than others who had less than four years of digital gaming experience. There was a positive correlation between the participants who played digital games for four years or more in all the components of SLA. These expert gamers who had been playing digital games for more than four years, had significantly higher mean cumulative total final grades as well as a lower rate of repeating courses.

In our study, the significant differences in SLA were noted in students who indicated that they had as minimum as four years’ experience in playing digital games. This finding supported other studies findings that long exposure to playing digital games is beneficial to EFL learning. However, it was a shorter time period, four years as opposed to six or more, that had been previously reported in the literature. The reasons for this difference can only be speculated upon but might be an indication of the impact that digital game-playing has had in Saudi Arabian society.

Students’ perceptions from the focus groups were in line with this finding from the correlational analysis. Students who indicated that they had a long experience in playing digital games stated that gaming introduced them to the English language before they officially commenced their English language education in school. Focus group students also mentioned that many of the English vocabularies and expressions that they know and use were initially encountered while playing digital games.

However, unlike other studies, neither the correlational analysis results nor students’ perceptions in this study stated or indicated any sign of relationship between frequency of playing digital games and students’ language achievement. Therefore, according to the findings of this study, extensive hours of daily play or increased numbers of playing days per week might not be as effective as years of digital gaming experience in regard to students’ language achievement in English. This could be related to the concept of informal and incidental learning which is considered to have an effect as a result of long-term exposure to the target language.
6.1.2 Research Question 1, sub-question 2

This section answers the first sub-question: *To what extent does the type of digital games played relate to students’ language achievement?*

This study found a statistically significant relationship between the different types of digital games students played and their SLA. Overall, the students who indicated in the questionnaire that they played rich in language games had higher language achievement in comparison to those who played games which did not offer much opportunity for language use. There was a positive correlation between the participants who played rich in language games or rich and moderate in language games combined and all the components of SLA. These students who had significantly higher mean cumulative total final grades, also had a lower rate of course repetitions. Conversely, findings from the correlational analysis showed that players of low in language games had lower SLA levels compared to others who played games higher in language use.

The findings of student perceptions captured via questionnaire supported this finding by showing a general trend toward the perceived positive effect of digital games on the students’ EFL learning achievements. This trend was stronger when analysing the perceptions of students who specifically played rich in language games: the group of participants who played rich in language games had a higher percentage of agreement in relation to the positive effect of digital games on language learning (the agreement reached over 90% in some questions).

The focus group findings supported and extended the findings of the questionnaire, indicating that students perceived a beneficial effect of playing rich in language digital games on their EFL learning. In the focus groups the students explained explicitly their views on the types of games that were useful for EFL learning. Specifically, the focus groups identified adventure, role-playing and simulation games as the most helpful in EFL learning because they were rich in language. Students explained that exposure to rich in language digital games provided them with seamless language learning as they were motivated to learn the language in order to successfully continue playing the game. These qualitative findings reinforced the value of the indirect and incidental language learning processes. They highlighted the specific features of the rich in language games which were most useful to the students, which were the number of opportunities to encounter and use English language through rich dialogues and story events in these games. The participants also identified that other types of games such as sport and car race games were not useful in EFL learning because of their minimal use of English. They pointed out that low in
language games might be beneficial in providing them with certain expressions related to the theme or genre of the game. However, the use of the specific expressions provided by low in language games is too context specific to be of real benefit to EFL learners. In addition, students also explained that the objectives of these low in language games were easy to understand and achieve whenever they discover how to start and play the game, which minimises the need to use and understand the language of the game. This confirmed what was found in the correlational findings that, unlike low in language digital games, exposure to rich in language digital games might essentially have a positive effect on the language achievement of EFL learners. The results of students’ perceptions and focus groups supported and added another layer of explanation of the strong statistical findings in the correlational analysis in relation to the types of games students played and their language achievement.

To sum up, in addition to the statistical findings that showed a significant correlation between students’ language achievement and playing rich in language digital games, students’ perceptions captured by the questionnaire and the focus groups provided strong support for the perceived positive effect of playing rich in language digital games on EFL learning.

6.1.3 Research Question 1, sub-question 3

This section answers the second sub-question: How does engaging in online social interaction in English whilst playing digital games relate to students’ language achievement?

This correlational study found a strong, statistically significant relationship between the level of engagement in social interactions when playing online games and students’ language achievements in speaking and listening. The students who indicated in the questionnaire that they interacted highly by English speaking or listening while playing online games had significantly higher speaking and listening final grades, compared to the other students who did not engage significantly in online social interaction in English. Overall, the students who interacted highly by speaking or listening in English while playing online games had significantly higher mean cumulative total final grades and a lower rate of repetition. Furthermore, the two groups of participants who interacted highly by speaking and listening showed a positive correlation with their scores in the two specific language skills, with higher mean final grades in their speaking and listening courses.
The students’ perceptions captured via the final section of the questionnaires complemented this finding by showing that communication skills in English (especially spoken communications) were perceived as one of the most affected skills when playing digital games. Additionally, the perceptions of students who specifically interacted highly by English listening or speaking while playing online games showed a further increase in views toward the positive effect of digital games on communication skills in English. The participants in the two groups (who interacted highly by speaking and who interacted highly by listening) had stated that digital gaming is strongly beneficial to enhance English communication skills with positive answers that exceeded 80% of views. Further analysis of the perceptions of participants who interacted highly by English listening or speaking in online games showed their strong beliefs about the positive effect of digital games on communication skills in English.

The focus group participants views confirmed and extended the findings from the questionnaire, explaining that online interaction during playing digital games played an important role in improving their English communication skills, particularly in the areas of speaking and listening. The students in focus groups explicitly explained that the other EFL-related benefits to social online interactions while playing digital games such as improving their pronunciation and accent. They highlighted that when interacting with gamers, especially native English speakers, they mostly listen to the correct pronunciation of English words which improves their speaking as well as listening skills. Focus group participants also stated that playing with people from around the world allowed them with to encounter various English accents which added to their knowledge about the language as well as enriching their listening and speaking skills. In addition, focus groups specified that online social interaction in digital games reinforced communication skills, particularly when participating in everyday social conversations. Students also indicated that improving communication skills was important to them because these skills were transferable to their formal EFL education.

In summary, students’ perceptions captured by questionnaires and the focus groups supported and informed the significant correlation found between EFL students’ communication skills and engaging in online social interaction. These complementary findings provided further indication of the strong relationship between online social interaction and achievement in English language speaking and listening. This finding is in line with Vygotsky’s sociocultural theory which
indicates that involvement in social interactions and social activities is effective in second/foreign language acquisition.

6.1.4 Research questions 2 and 3

This section answers the second and third research questions in this study: What are the students’ perceptions of the potential of the digital games to enhance their EFL learning? And What are students’ perceptions of the effect of digital games on their EFL learning?

The findings which allow to answer these questions emerged from the students’ perceptions captured via the final section of the questionnaires and focus groups. Firstly, the findings of both sources of students’ perceptions indicated the importance of utilising digital games as an ‘out-of-class’ activity, rather than as an in-class activity. The group discussions in the focus groups explained that this choice was due to perceived problems with time constraints and classroom management issues in the formal classroom setting. According to students’ perceptions, these issues would prevent benefitting from the full experience of digital games for language learning.

The second key finding was that social interactions in online games were considered as an important factor that encouraged EFL learners to use and practise English outside as well as inside the classroom. Language learning through digital games was seen as beneficial in regard to introducing EFL learners to everyday language use and widening their knowledge about the popular culture of the target language. This is owing to the fact that in-games dialogues and online interactions generally use colloquial English and a diversity of accents and dialects, which was seen as a valuable “add-on” to the formal EFL learning that takes place in the classroom.

The third key finding that was captured in the focus groups was that rich in language digital games (such as adventure and role-playing games) can improve EFL learners’ English reading skills particularly. According to these students, English reading comprehension and speed can be enriched when enabling the subtitle feature whilst playing these games. The subtitles of dialogues between game characters were seen as a useful feature for EFL learners’ reading skills, because they associate written text with the spoken dialogues. This provided EFL learners with two language inputs which facilitated understanding the used language.

Finally, two complementary findings emerged from the focus groups’ discussions. An overarching viewpoint was that English language was used as a tool to play digital games, and at
the same time, digital games were also used indirectly to enrich EFL learning. In other words, while students used English language in gaming, playing these games allowed them to encounter English repeatedly which enhanced their language learning. The use of English language to accomplish gaming objectives gave EFL learners frequent encounters with English expressions which supported the indirect and incidental language learning processes that occur while playing digital games. This frequent involvement with English while gaming was perceived as an important provider of authentic English language, and as a facilitator of understanding and practising EFL.

6.2 Significance of the study

The proposed study has made significant contribution to practical and conceptual understanding of using digital games in EFL learning. Statistically significant results provided evidence of strong relationship between playing rich in language digital games which provide plentiful opportunities for using English language for reading and communication in leisure-based activities. The outcomes of this study demonstrated a high level of understanding and acceptance by EFL learners of digital games as an innovative tool for their learning of English as a foreign language in the context of Saudi Arabia.

The study added to the body of literature on the “commercial-off-the-shelf”, rich in language digital games and EFL learning. Specifically, it provided additional detail about the connection between EFL leaning and the length of exposure needed for playing the games prior to the formal study of the English language to give maximum benefit to the learner.

The findings of the study contributed to the limited research literature in the Saudi Arabian context. This is the only study to date which demonstrated statistically significant connection between EFL learning and playing particular type of digital games as an extramural activity in a tertiary institution. This connection was also demonstrated to be significant from the point of view of the learners themselves.

The findings provided a foundation for further evidence-based educational practice on the integration of digital games into EFL teaching in Saudi Arabia and beyond. In particular, the study informed teachers and administrators at English language institutions on the innovative avenues of utilising digital technologies to facilitate English teaching.
The study added Saudi Arabian cultural perspective to the body of current research on
digital gaming and EFL learning. It highlighted the role of incidental use of social interactions in
acquiring the English language in non-English speaking countries.

6.3 Study limitations

The study is limited by three methodological factors related to specific context of this study, the
selection of participants, and the study method.

The context of this study was an English language centre at a tertiary institution in Saudi
Arabia and only included EFL learners from Saudi Arabia. Therefore, generalisation of the
participants’ gaming patterns and preferences, which contributed to the distinctive findings of the
study, are limited to the Saudi context or other similar contexts. Further, the participants in the
study represent EFL learners that live in a main city that has a diverse population and therefore the
results are limited to this cohort of Saudi EFL learners and cannot be generalised to rural-based
communities. However, findings of this study might be applied to other similar EFL contexts.

The participants of the study were recruited from a gender segregated educational
institution in Saudi Arabia. As detailed in the Methodology chapter, the study was conducted in a
male-only context and involved only male participants. Due to segregated (single-gender)
education in Saudi Arabia, the researcher (who is a male) was only able to gain full access to the
male section of the institution. Therefore, the study is limited to the male gender only and cannot
be generalised to EFL female learners in Saudi context. The findings of this study are limited to
English as a Foreign Language (EFL) learners and cannot be generalised to all English as a Second
Language (ESL) learners. The major difference between the two cohorts is the amount of exposure
to the target language. Unlike ESL learners, EFL learners have limited access and less exposure to
the target language due to the fact that they live in a non-English speaking country. Therefore, the
findings of this study are exclusive to similar contexts of EFL learners.

The methodology of this study provided the findings of the correlational analysis section
which cannot provide a conclusive result about a causation relationship between the study
variables. While the correlational findings presented a significant relationship between digital
gaming and Students Language Achievement (SLA) levels, other factors might also affect this
relationship. The part of the study that captured students’ perceptions (the last section of the
questionnaire and the focus groups) provided complementary findings and allowed for a more
conclusive interpretation of the overall study findings. In addition, the relationship found between playing digital games and language learning in the analysis of focus groups opens an interesting avenue for its further theorising and research as a reciprocal, two-directional positive relationship between playing particular types of digital games and EFL learning.

6.4 Suggestions for future research

This study provided strong answers to the research questions, nevertheless, it provided several aspects that future research could investigate to inform the literature in relation to playing digital games and English language learning.

This study found a strong correlation between playing digital games and EFL learning, this result coupled with the findings of students’ perceptions and allowed us to suggest some possibility of a cause – effect relationship. However, further research which employs an experimental methodology that involves an intervention using digital games in EFL learning is necessary to obtain further evidence of the impact of such games on EFL learning. Some studies conducted interventions with educational purposes mostly as part of the class time. However, this study suggests that future researchers should consider conducting an experimental study that involves using digital games as an out-of-class activity. This suggestion of utilising digital games as an out-of-class activity is supported by the perceptions of most of the participants in this study who suggested that games should be used outside of the EFL classroom context. These experimental interventions should include a study of the effect of interactions in online games on communicative skills particularly English speaking and listening skills which, based on the findings of this study, were found to be positively affected by interactions in online games.

This study only included male participants, but a comparative study with female participants in the same cultural context would provide a holistic picture and a broader understanding of the possible use of digital games in EFL learning in a tertiary educational context of Saudi Arabia.

One of the limitations of this study was that it only included the learners. Therefore, conducting a study that involves EFL educators such as teachers, administration staff and policy makers would provide an insight into the readiness of the tertiary educational sector in Saudi Arabia for implementation of digital games in EFL learning.
6.5 Recommendations for EFL learning

Several recommendations can be gained for using digital games in EFL learning from the findings of this research study. The recommendations are directed towards EFL/ESL educators, learners and institutions, as well as the overall context of EFL/ESL field.

It can be suggested that EFL educators in the EFL context in Saudi Arabia consider the playing of digital games as an important and readily available source of English language learning. As this study indicated, EFL learners in the Saudi tertiary sector believe that this could be useful for their learning and they appear to be ready to embrace this option. Digital games provide EFL learners with plentiful exposure to the target language, which makes them an ideal extra educational resource for EFL learning. Secondly, according to the findings of this study, involving EFL learners in playing games that are categorised as rich in language is likely to have a positive impact on their EFL learning, particularly given that the learners themselves consider this as an effective and attractive option. This study found that adventure, role-playing and simulation games are the most effective games in regard to EFL learning. Integrating these games in the learners’ language activities will potentially improve their EFL learning and increase their motivation to learn the language.

The findings of this study suggest that players who will to enrich their EFL learning should target certain types of games. In this study, there was a strong support that EFL learners who engage in playing rich in language games had significantly higher SLA. These games provide plentiful opportunities for immersion in the use of English in an authentic manner. Therefore, EFL learners who are interested in playing digital games are recommended to engage in adventure, role-playing and simulation games, as well as use the opportunities for improving and increasing their communication skills. These types of games are rich in language which provide considerable amounts of English language exposure and practice. Additionally, interactions through digital games will also equip EFL learners with ‘every day-use language’ as well as improve pronunciation and idiomatic language use.

6.6 Coda

The need to improve the English language skills of EFL learners in Saudi Arabia was the motivating issue for this research study. This can be achieved by increasing the stimulation and motivation for language learning for young adults by utilisation of a new student-centred
pedagogical strategies rather than the more common teacher-centred strategies of the traditional classroom. This study provided strong positive indications about the utilisation of different types of digital gaming opportunities as means of facilitating EFL learning as an out of classroom leisure activity.

The major findings of the study confirmed that playing certain types of digital games might have a positive effect on some aspects of EFL learning. Specifically, playing digital games that require and provide a rich use and exposure to the English language such as adventure games, role-playing games and simulation games, can contribute to the achievement of EFL learners. These games stimulate the incidental and indirect language learning process. In this process, the learners’ attention is directed toward playing and succeeding in the game, while they unintentionally internalise a large number of language expressions, vocabulary and structures.

The outcomes of this study identified social interaction experiences through online gaming as an important provider of authentic English language environment. EFL learners engaging in digital game social interactions benefitted from these practices, particularly in enhancing communicative competencies. These outcomes were supported by the theoretical concepts of sociocultural theory, which highlights the importance of social interactions in knowledge acquisition.

The various affordances of involvement in digital gaming environments for English language learning were demonstrated in this study as well as other studies in the literature. The conclusions of this study reflected that digital games affordances were observed by EFL learners in Saudi Arabia, with more emphasis on communication skills and informal everyday social exchanges. The views of Saudi Arabian EFL learners indicated their willingness to participate in activities involving digital games to enrich their EFL learning experiences, specifically when these activities are utilised as part of their out of class language learnings.
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Appendix A

Questionnaire

I. Demographics and language learning achievement.
   1. What is your name (first and last name)?
   2. What is your language level?
   3. What is your class?
   4. How old are you (18 - 27)?
   5. When did you start studying at the English Language Centre (ELC)? (Month/Year)
   6. Which level of English did you start your study at the ELC?
      a. Level 1 (Preparatory)
      b. Level 2 (Elementary)
      c. Level 3 (Intermediate)
      d. Level 4 (Advanced)
   7. How many hours do you study per week?
      a. Less than an hour / 1 hour / 2 hours / 3 hours / 4 hours / 5 hours / 6 hours / More than 6 hours.

II. Patterns of playing digital games.

   8. Approximately, how many years have you been playing digital games?
      a- I do not play digital games.
      b- 1 year
      c- 2 years
      d- 3 years
      e- 4 years
      f- More than 4 years

   9. During your normal week, how many days do you usually play digital games?
      a. Never.
      b. 1 day
      c. 2 days
      d. 3 days
      e. 4 days
f. 5 days

10. How many hours per day do you spend playing digital games?

During working days:

a. 0 hours
b. 1 hour
c. 2 hours
d. 3 hours
e. 4 hours
f. 5 hours
g. more than 5 hours

During Weekends:

a. 0 hours
b. 1 hour
c. 2 hours
d. 3 hours
e. 4 hours
f. 5 hours
g. more than 5 hours

III. Type of played digital games.

12. In regard to English language, what type of digital games do you mostly play?

a- Games that are rich in English language. (Which include plenty of dialogues and texts that need to comprehend. Like: adventure, role playing, simulation or similar. Such as: Resident Evil, Metal Gear Solid, The Sims, Final Fantasy, or similar)

b- Games that are moderate in English language. (Which include moderate amount of dialogues and texts that need to comprehend. Like: first person shooter, fighting, design/art or similar. Such as: Call of Duty, Tekken, Design a House or similar)

c- Games that are low in English language. (Which include minimum or no amount of dialogues and texts that need to comprehend. Like: car racing, sports, puzzle games or similar. Such as: Need for Speed, Candy Crush, FIFA or similar)
IV. Engaging in online social interaction in relation to digital games.

*Please rate the following statements on a scale from “strongly disagree” to “strongly agree.”*

13. I speak a lot of English while playing online digital games.
(strongly disagree- disagree-neither agree nor disagree-agree-strongly agree)

14. I read a lot of English while playing online digital games.
(strongly disagree- disagree-neither agree nor disagree-agree-strongly agree)

15. I listen to a lot of English while playing online digital games.
(strongly disagree- disagree-neither agree nor disagree-agree-strongly agree)

16. I write a lot of English while playing online digital games.
(strongly disagree- disagree-neither agree nor disagree-agree-strongly agree)

V. Students’ perceptions.

*Please rate the following statements on a scale from “strongly disagree” to “strongly agree.”*

1. I learn new words and expressions playing digital games.
(strongly disagree- disagree-neither agree nor disagree-agree-strongly agree)

2. Sound bites, pictures, and graphics helped me to get the meaning better.
(strongly disagree- disagree-neither agree nor disagree-agree-strongly agree)

3. I think language learning through digital games is interesting.
(strongly disagree- disagree-neither agree nor disagree-agree-strongly agree)

4. Digital games could be used to effectively teach a foreign language.
(strongly disagree- disagree-neither agree nor disagree-agree-strongly agree)

5. Playing digital games relevant to foreign language coursework would be a valuable use of class time.
(strongly disagree- disagree-neither agree nor disagree-agree-strongly agree)

6. Playing digital games relevant to foreign language coursework would be a valuable use of out-of-class time.
7. Digital games and school should be kept separate.

8. Digital games provided opportunities for developing language fluency.

9. When gaming, I felt like I was in an English-speaking country.

10. Playing digital games makes me want to learn English.

11. During playing digital games I learn English listening skills

12. During playing digital games I learn English speaking skills

13. During playing digital games I learn English reading skills

14. During playing digital games I learn English writing skills

15. During playing digital games I learn English grammar skills
Appendix B

Focus Group Questions

1. While playing digital games, how do you feel when you face a word or expression you don't understand? What do you do?

2. Do you think the digital world of the game helps you learning English, e.g. to get the meaning of new words and expressions (or not)? How?

3. What are you learning from playing digital games in general?

4. In relation to your own EFL learning, do you feel that digital games helped you to improve your English language? How?

5. What types of digital games do you think help in EFL learning? And which are not helpful?

6. If you are an English teacher, how can you get the best of digital games to facilitate language learning?

7. Further comments on using digital games in English teaching and learning.
Appendix C

The Institute of Public Administration (IPA)

The Institute of Public Administration is an autonomous government agency that provides public and private sectors with training, research, and consultation in administrative, financial, economical, library, and business areas. IPA activities fall into four main categories:

1. In-service and pre-service training
2. Consultations
3. Administrative research
4. Administrative documentation

The IPA provides two types of training courses: first, In-service short training courses (Training Programs) on a period of (3-5) days provided to public and private sectors employees, administrators. These courses intend to provide trainees from different organisations with administrative, practical, high-tech skills, and end with a completion certificate provided to trainees. The other type are lengthy courses (two - three) years (Preparatory Programs) that qualify students who graduated from high school/university for an associate degree (Diploma/Post-Graduated Diploma) in any major of their choice. IPA provides long-term courses in more than 17 majors, including: Management, Accounting, Marketing, Banking, and Computer Programming.

Preparatory training provides diploma programs for high school/university graduates to qualify them for specific employment in government agencies as well as private institutions. Students who enrol in these long courses (Preparatory Programs) are usually obligated to enrol in a one-year – or less depending on their placement test – English intensive program as a prerequisite before commencing their diploma/Post-Graduated Diploma majors. This ESL intensive training course is conducted in the English Language Centre (ELC).
CONSENT FORM FOR PARTICIPANTS

TITLE OF THE STUDY: Digital Games and English as Foreign Language (EFL) Learning in Tertiary Education in Saudi Arabia

RESEARCHER: Abdullah Alamr

I have been given information about the research project entitled “Digital Games and English as Foreign Language (EFL) Learning in Tertiary Education in Saudi Arabia” and the research project with Abdullah Alamr who is conducting this research as part of Doctor of Philosophy requirements supervised by A/Prof Irina Verenikina in school of Education at the University of Wollongong.

I have been advised of the risks and benefits associated with this research and have had an opportunity to ask Abdullah Alamr any questions I may have about the study and my participation.

I understand that my participation in this pilot study is voluntary. I am free to refuse to participate and I am free to withdraw from this study at any time and withdraw any data that I have provided to that point. My refusal to participate or withdrawal of consent will not affect my relationship to the researcher and with any parties in my faculty and or with the University of Wollongong.

I understand that the results of this study will provide inputs for this research, which aims to investigate the effect of digital gaming on English language learning. The study will provide ESL/EFL teachers and learners with the possible relationship between language learning and digital gaming in addition to ESL/EFL learners perceptions which will participate to improve ESL/EFL teaching at the ELC in IPA. Findings of this study will be available for you to explore after thesis submitted and published in the University of Wollongong website.

I also understand that the collected data will be used for publication such as a PhD thesis and journal articles.

I have been informed that all the information gained from the questionnaires, focus groups and interviews will not be seen by others and only used by the researcher. And my information will not be given to any other person or parties without my permission/consent. In addition, my confidentiality as a participant will be preserved and that I will be given pseudonyms instead of my real name during data processing and analysis as well as in the subsequent publication of the project findings. However, I understand that I will provide the researcher with my name in order to match my language level and exam marks with my questionnaire results.
If I have any enquiries about the pilot study, I can contact Abdullah Alamr on +61427773599 or email: asa576@uowmail.edu.au, A/Prof Irina Verenikina on +61242214285 or email: irina@uow.edu.au or Dr. Rose Dixon on +610242215292 or email: roselyn@uow.edu.au. I understand that this study has been reviewed by the Social Sciences Human Research Ethics Committee of the University of Wollongong. If you have any concerns or complaints regarding the way this research has been conducted you can contact the UOW Ethics Officer on +612 4221 3386 or email rso-ethics@uow.edu.au.

By completing the survey which will take approximately 20 minutes to complete and include questions such as name, age, language level and digital gaming patterns, I give my consent to participate in this research as outlined in the information sheet and the consent form.

☐ Participating in this research

If you are interested in participating in focus group, please tick the box below and we will contact you via email:

☐ I am interested in participating in focus group interview as a follow-up from the survey

Signed                        Date

................................................................................................. ......./...../......
Name (please print)

.................................................................................................
Appendix E

Consent Form for Student Participants (Focus Group)

CONSENT FORM FOR PARTICIPANTS

TITLE OF THE STUDY: Digital Games and English as Foreign Language (EFL) Learning in Tertiary Education in Saudi Arabia

RESEARCHER: Abdullah Alamr

I have been given information about the research project entitled “Digital Games and English as Foreign Language (EFL) Learning in Tertiary Education in Saudi Arabia” and the research project with Abdullah Alamr who is conducting this research as part of Doctor of Philosophy requirements supervised by A/Prof Irina Verenikina in school of Education at the University of Wollongong.

I have been advised of the risks and benefits associated with this research and have had an opportunity to ask Abdullah Alamr any questions I may have about the study and my participation.

I understand that my participation in this pilot study is voluntary. I am free to refuse to participate and I am free to withdraw from this study at any time and withdraw any data that I have provided to that point. I understand that if I wish to withdraw provided information in the focus group, the researcher will ignore any recorded information provided by me and it will not be considered as part of the study. My refusal to participate or withdrawal of consent will not affect my relationship to the researcher and with any parties in my faculty and or with the University of Wollongong.

I understand that the results of this study will provide inputs for this research, which aims to investigate the effect of digital gaming on English language learning. The study will provide ESL/EFL teachers and learners with the possible relationship between language learning and digital gaming in addition to ESL/EFL learners perceptions which will participate to improve ESL/EFL teaching at the ELC in IPA. Findings of this study will be available for you to explore after thesis submitted and published in the University of Wollongong website.

I also understand that the collected data will be used for publication such as a PhD thesis and journal articles.

I have been informed that all the information gained from the questionnaires, focus groups and interviews will not be seen by others and only used by the researcher. And my information will not be given to any other person or parties without my permission/consent. In addition, my confidentiality as a participant will be preserved and that I will be given pseudonyms instead of
my real name during data processing and analysis as well as in the subsequent publication of the project findings

If I have any enquiries about the pilot study, I can contact Abdullah Alamr on +61427773599 or email: asa576@uowmail.edu.au, A/Prof Irina Verenikina on +61242214285 or email: irina@uow.edu.au or Dr. Rose Dixon on +610242215292 or email roselyn@uow.edu.au. I understand that this study has been reviewed by the Social Sciences Human Research Ethics Committee of the University of Wollongong. If you have any concerns or complaints regarding the way this research has been conducted you can contact the UOW Ethics Officer on +612 4221 3386 or email rso-ethics@uow.edu.au

By ticking the box below, I give my consent to participate in the focus groups of this research as outlined in the information sheet and the consent form, which will take approximately 20 minutes and include questions such as:

- While playing digital games, how do you feel when you face a word or expression you don't understand? What do you do?
- Do you think that digital games provide opportunities for you to work on improving your English language? How?
- What kind of digital games do you think help in language learning? And which are not helpful?

☐ Participating in focus group interview

Signed                                           Date
..........................................................................................  ....../....../.....
Name (please print)
..........................................................................................
Appendix F

Statistically Insignificant tests

A. Days of playing a week vs SLA

Students were categorised as experienced and non-experienced gamers also according to their playing days in a normal week. However, all performed tests (T-test for grades and Chi-square for repetition and language level) did not show any significant difference between the two groups’ SLA. As shown in the tables below.

Table. Experienced vs non-experienced gamers total final grades T-test (days a week)

<table>
<thead>
<tr>
<th>T-test Days vs Grades (p=.167)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent Samples Test</td>
</tr>
<tr>
<td>Levene’s Test for Equality of Variances</td>
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<tr>
<td>Equal variances assumed</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
</tr>
</tbody>
</table>

Table. Experienced vs non-experienced gamers repetition record Chi-Square Tests (days a week)

<table>
<thead>
<tr>
<th>Days vs Repetition (p=.304)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square Tests</td>
</tr>
<tr>
<td>Value</td>
</tr>
<tr>
<td>Pearson Chi-Square</td>
</tr>
<tr>
<td>Continuity Correction(^b)</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
</tr>
<tr>
<td>Fisher's Exact Test</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
</tr>
<tr>
<td>N of Valid Cases</td>
</tr>
</tbody>
</table>
B. Hours of playing vs SLA

The last categorisation of students in the variable (patterns of play) was according to the amount of time (hourly) they play during weekdays and weekends. Students were divided into heavy, moderate, and light gamers (H/M/L) based on the number of hours they play digital games. However, all performed tests (ANOVA for grades and Chi-square for repetition and language level) for both weekdays and weekends did not show any significant difference between H/M/L groups’ SLA. All tests are presented in the tables below.

Table. Heavy, moderate and light gamers’ total final grades ANOVA Test. (weekdays)

ANOVA H/M/L (weekdays) vs Grades (p=.685)

Tests of Between-Subjects Effects

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>132.255</td>
<td>2</td>
<td>66.128</td>
<td>.379</td>
<td>.685</td>
</tr>
<tr>
<td>Intercept</td>
<td>1672187.302</td>
<td>1</td>
<td>1672187.302</td>
<td>9571.673</td>
<td>.000</td>
</tr>
<tr>
<td>H/M/L_weekdays</td>
<td>132.255</td>
<td>2</td>
<td>66.128</td>
<td>.379</td>
<td>.685</td>
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<tr>
<td>Error</td>
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<td>174.702</td>
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<tr>
<td>Corrected Total</td>
<td>65820.084</td>
<td>378</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

a. R Squared = .002 (Adjusted R Squared = -.003)

Table. Heavy, moderate and light gamers’ total final grades ANOVA Test. (weekends)

ANOVA H/M/L (weekend) vs Grades (p=.123)

Tests of Between-Subjects Effects

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
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<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
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</thead>
<tbody>
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<td>2.111</td>
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<tr>
<td>H/M/L_weekends</td>
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<td>365.427</td>
<td>2.111</td>
<td>.123</td>
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<tr>
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<td>65089.230</td>
<td>376</td>
<td>173.110</td>
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<tr>
<td>Total</td>
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<td>379</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Corrected Total</td>
<td>65820.084</td>
<td>378</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. R Squared = .011 (Adjusted R Squared = .006)
Table. Heavy, moderate and light gamers’ repetition record Chi-Square Test. (weekdays)

**H/M/L (weekdays) vs Repetition (p=.858)**

<table>
<thead>
<tr>
<th>Chi-Square Tests</th>
<th>Value</th>
<th>df</th>
<th>Asymptotic Significance (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>.305^a</td>
<td>2</td>
<td>.858</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
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<td>.857</td>
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<td>.835</td>
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<td>N of Valid Cases</td>
<td>379</td>
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</table>

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 27.01.

Table 19. Heavy, moderate and light gamers’ repetition record Chi-Square Test. (weekends)

**H/M/L (weekends) vs Repetition (p=.171)**

<table>
<thead>
<tr>
<th>Chi-Square Tests</th>
<th>Value</th>
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<th>Asymptotic Significance (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
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</table>

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 16.39.
# Appendix G

A Comprehensive Table of Statistically Significant Results

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<thead>
<tr>
<th>Dependent variable</th>
<th>Independent Variable</th>
<th>Performed Test</th>
<th>Significance level (p=value)</th>
<th>Tested Groups</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>A. Years of experience.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Years of experience.</td>
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<tr>
<td></td>
<td>C. Separate tests</td>
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</tr>
<tr>
<td></td>
<td>D. 1st combined groups tests</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Tuckey’s HSD</td>
<td>.016</td>
<td>1. Rich L gamers  2. Low L gamers</td>
</tr>
<tr>
<td></td>
<td>E. 2nd combined groups tests</td>
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<td>---------------------------</td>
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<td>---------------------------</td>
<td>---------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Total Final Grades</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3. Online Social Interaction:</td>
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<td></td>
</tr>
<tr>
<td>A. Speaking Interaction level.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tuckey’s HSD</td>
<td></td>
<td>1. Rich and Moderate L gamers</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Low L gamers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ANOVA</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>1. High online speaking interaction.</td>
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<td>2. Moderate online speaking interaction.</td>
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<td></td>
<td>3. Low online speaking interaction.</td>
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<tr>
<td></td>
<td>Tuckey’s HSD</td>
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<td>1. High online speaking interaction.</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Low online speaking interaction.</td>
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</tr>
<tr>
<td><strong>Speaking and listening Grades</strong></td>
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<td>3. Online Social Interaction:</td>
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<tr>
<td>A.1. Speaking Interaction level.</td>
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<td>Tuckey’s HSD</td>
<td></td>
<td>1. High online speaking interaction.</td>
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<td></td>
<td></td>
<td>2. Moderate online speaking interaction.</td>
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<td></td>
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<td>3. Low online speaking interaction.</td>
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<td>Tuckey’s HSD</td>
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<td>1. High online speaking interaction.</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Low online speaking interaction.</td>
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<tr>
<td><strong>Writing Grades</strong></td>
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<td></td>
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<td>3. Online Social Interaction:</td>
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<td></td>
</tr>
<tr>
<td>B. Writing Interaction level.</td>
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</tr>
<tr>
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<td>Tuckey’s HSD</td>
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<td>1. High online writing interaction.</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Moderate online writing interaction.</td>
<td></td>
</tr>
<tr>
<td><strong>Total Final Grades</strong></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>3. Online Social Interaction:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Listening Interaction level.</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>ANOVA</td>
<td></td>
<td>1. High online listening interaction.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Moderate online listening interaction.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Low online listening interaction</td>
<td></td>
</tr>
<tr>
<td><strong>Speaking and listening Grades</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Online Social Interaction:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Listening Interaction level.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ANOVA</td>
<td></td>
<td>1. High online listening interaction.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Moderate online listening interaction.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Low online listening interaction</td>
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</tr>
</tbody>
</table>
## Appendix H

### Table of perceptions of rich in language games players (RL) in relation to all questions

<table>
<thead>
<tr>
<th>Questions</th>
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<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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<tbody>
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<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
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<tr>
<td>1. I learn new words and expressions playing digital games.</td>
<td>91</td>
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<td>42</td>
<td>29.2</td>
<td>8</td>
</tr>
<tr>
<td>2. Sound bites, pictures, and graphics helped me to get the meaning better.</td>
<td>87</td>
<td>60.4</td>
<td>39</td>
<td>27.1</td>
<td>15</td>
</tr>
<tr>
<td>3. I think language learning through digital games is interesting.</td>
<td>97</td>
<td>67.4</td>
<td>38</td>
<td>26.4</td>
<td>6</td>
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<tr>
<td>4. Digital games could be used to effectively teach a foreign language.</td>
<td>68</td>
<td>47.2</td>
<td>43</td>
<td>29.9</td>
<td>24</td>
</tr>
<tr>
<td>5. Playing digital games relevant to foreign language coursework would be a valuable use of class time.</td>
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<td>48</td>
<td>33.3</td>
<td>30</td>
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<td>6. Playing digital games relevant to foreign language coursework would be a valuable use of out-of-class time.</td>
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<td>41.0</td>
<td>57</td>
<td>39.6</td>
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<tr>
<td>7. Digital games and school should be kept separate</td>
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<td>20.1</td>
<td>35</td>
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<td>37</td>
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<td>8. Digital games provided opportunities for developing language fluency</td>
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<td>27</td>
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<tr>
<td>10. Playing digital games makes me want to learn English</td>
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<tr>
<td>11</td>
<td>I learn English listening skills</td>
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<td>31</td>
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## Appendix I

Table of perceptions of rich and moderate in language games players (RML) in relation to all questions

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<th>Questions</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>1. I learn new words and expressions playing digital games.</td>
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<td>68.0</td>
<td>13</td>
<td>26.0</td>
<td>3</td>
</tr>
<tr>
<td>2. Sound bites, pictures, and graphics helped me to get the meaning better.</td>
<td>31</td>
<td>62.0</td>
<td>14</td>
<td>28.0</td>
<td>5</td>
</tr>
<tr>
<td>3. I think language learning through digital games is interesting.</td>
<td>36</td>
<td>72.0</td>
<td>13</td>
<td>26.0</td>
<td>1</td>
</tr>
<tr>
<td>4. Digital games could be used to effectively teach a foreign language.</td>
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<td>17</td>
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<td>5. Playing digital games relevant to foreign language coursework would be a valuable use of class time.</td>
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<td>20</td>
<td>40.0</td>
<td>10</td>
</tr>
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<tr>
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<td>8</td>
<td>16.0</td>
<td>17</td>
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<tr>
<td>8. Digital games provided opportunities for developing language fluency</td>
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<td>58.0</td>
<td>20</td>
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<td>1</td>
</tr>
<tr>
<td>9. When gaming, I felt like I was in an English-speaking country</td>
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<td>40.0</td>
<td>23</td>
<td>46.0</td>
<td>5</td>
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<tr>
<td>10. Playing digital games makes me want to learn English</td>
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<td>42.0</td>
<td>23</td>
<td>46.0</td>
<td>5</td>
</tr>
<tr>
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<td></td>
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</tr>
<tr>
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<td>I learn English listening skills</td>
<td>33</td>
<td>66.0</td>
<td>16</td>
<td>32.0</td>
</tr>
<tr>
<td>12</td>
<td>I learn English speaking skills</td>
<td>24</td>
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<td>19</td>
<td>38.0</td>
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<td>I learn English grammar skills</td>
<td>9</td>
<td>18.0</td>
<td>16</td>
<td>32.0</td>
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</tbody>
</table>
# Appendix J

Table of perceptions of players who interacted highly by speaking while gaming (IHS) in relation to all questions

<table>
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<tr>
<th>Questions</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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<td>N</td>
<td>%</td>
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<td>1 I learn new words and expressions playing digital games.</td>
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<td>2 Sound bites, pictures, and graphics helped me to get the meaning better.</td>
<td>122</td>
<td>59.8</td>
<td>62</td>
<td>30.4</td>
<td>15</td>
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<tr>
<td>3 I think language learning through digital games is interesting.</td>
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<td>65</td>
<td>31.9</td>
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<td>4 Digital games could be used to effectively teach a foreign language.</td>
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<td>70</td>
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<td>5 Playing digital games relevant to foreign language coursework would be a valuable use of class time.</td>
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<td>31.4</td>
<td>71</td>
<td>34.8</td>
<td>41</td>
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<tr>
<td>6 Playing digital games relevant to foreign language coursework would be a valuable use of out-of-class time.</td>
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<td>42.2</td>
<td>79</td>
<td>38.7</td>
<td>25</td>
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<td>7 Digital games and school should be kept separate</td>
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<td>53</td>
<td>26.0</td>
<td>47</td>
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<td>8 Digital games provided opportunities for developing language fluency</td>
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<td>64</td>
<td>31.4</td>
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<tr>
<td>9 When gaming, I felt like I was in an English-speaking country</td>
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<td>31.4</td>
<td>89</td>
<td>43.6</td>
<td>41</td>
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<tr>
<td>10 Playing digital games makes me want to learn English</td>
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<td>28.9</td>
<td>17</td>
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<tr>
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<td>During playing digital games</td>
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<td>---</td>
<td>---</td>
</tr>
<tr>
<td>11</td>
<td>I learn English listening skills</td>
<td>121</td>
<td>59.3</td>
<td>71</td>
<td>34.8</td>
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<tr>
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<td>I learn English speaking skills</td>
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<td>84</td>
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<td>27.5</td>
<td>56</td>
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<tr>
<td>15</td>
<td>I learn English grammar skills</td>
<td>44</td>
<td>21.6</td>
<td>59</td>
<td>28.9</td>
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### Appendix K

Table of perceptions of players who interacted highly by listening while gaming (IHL) in relation to all questions

<table>
<thead>
<tr>
<th>Questions</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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<td>I learn new words and expressions playing digital games.</td>
<td>159</td>
<td>55.6</td>
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<td>Sound bites, pictures, and graphics helped me to get the meaning better.</td>
<td>166</td>
<td>58.0</td>
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<td>I think language learning through digital games is interesting.</td>
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<td>89</td>
<td>31.1</td>
<td>19</td>
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<td>Digital games could be used to effectively teach a foreign language.</td>
<td>116</td>
<td>40.6</td>
<td>89</td>
<td>31.1</td>
<td>58</td>
</tr>
<tr>
<td>Playing digital games relevant to foreign language coursework would be a valuable use of class time.</td>
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<td>31.5</td>
<td>95</td>
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<td>60</td>
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<td>Playing digital games relevant to foreign language coursework would be a valuable use of out-of-class time.</td>
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<td>38.8</td>
<td>109</td>
<td>38.1</td>
<td>43</td>
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<tr>
<td>Digital games and school should be kept separate</td>
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<td>18.2</td>
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<td>75</td>
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<tr>
<td>Digital games provided opportunities for developing language fluency</td>
<td>156</td>
<td>54.5</td>
<td>107</td>
<td>37.4</td>
<td>19</td>
</tr>
<tr>
<td>When gaming, I felt like I was in an English-speaking country</td>
<td>74</td>
<td>25.9</td>
<td>118</td>
<td>41.3</td>
<td>71</td>
</tr>
<tr>
<td>Playing digital games makes me want to learn English</td>
<td>154</td>
<td>53.8</td>
<td>97</td>
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<td>29</td>
</tr>
<tr>
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</tr>
<tr>
<td>11</td>
<td>I learn English listening skills</td>
<td>156</td>
<td>54.5</td>
<td>106</td>
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</tr>
<tr>
<td>12</td>
<td>I learn English speaking skills</td>
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<td>I learn English writing skills</td>
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<td>I learn English grammar skills</td>
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<td>16.4</td>
<td>74</td>
<td>25.9</td>
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</tbody>
</table>
Appendix L

UOW Approval Email from HREC

Subject: HREC Approval of Application 2016/949
Date: Tuesday, 13 December 2016 at 1:57:43 pm Australian Eastern Daylight Time
From: irma-support@uow.edu.au
To: irina@uow.edu.au
CC: Abdullah Alamr, roselyn@uow.edu.au, rso-ethics@uow.edu.au

Dear Associate Professor Verenikina,

I am pleased to advise that the application detailed below has been approved.

Ethics Number: 2016/949
Approval Date: 13/12/2016
Expiry Date: 12/12/2017
Project Title: Digital Games and Language Learning - Effects and Perceptions of ESL Learners and Teachers
Researchers: Verenikina Irina; Alamr Abdullah; Dixon Roselyn

Documents Approved:
- Response to Review Form V1 12122016
- Invitation Email for Students Participants (Survey) V1 12122016
- Invitation Email for Students Participants (Focus Group) V1 12122016
- Invitation Email for Teachers Interviewees V1 12122016
- Information Sheet for Students Participants (Survey) V2 12122016
- Information Sheet for Students Participants (Focus Group) V2 12122016
- Information Sheet for Teachers Interviewees V2 12122016
- Consent Form for Students Participants (Survey) V2 12122016
- Consent Form for Students Participants (Focus Group) V2 12122016
- Consent Form for Teachers Interviewees V2 12122016
- Research Cite Approval Letter V1 01112016
- Survey V1 01112016
- Focus Group Questions V1 01112016
- Interview Questions V1 01112016

The HREC has reviewed the research proposal for compliance with the National Statement on Ethical Conduct in Human Research and approval of this project is conditional upon your continuing compliance with this document. Compliance is monitored through progress reports; the HREC may also undertake physical monitoring of research.

Approval is granted for a twelve month period; extension of this approval will be considered on receipt of a progress report prior to the expiry date. Extension of approval requires:

- The submission of an annual progress report and a final report on completion of your project.
- Approval by the HREC of any proposed changes to the protocol or investigators.
- Immediate report of serious or unexpected adverse effects on participants.
- Immediate report of unforeseen events that might affect the continued acceptability of the project.

If you have any queries regarding the HREC review process or your ongoing approval please contact the Ethics Unit on 4221 3386 or email rso-ethics@uow.edu.au.

Yours sincerely,
Appendix M

Research cite approval letter from ELC at the IPA

Kingdom of Saudi Arabia
Institute of Public Administration

Mr. Abdullah Saleh Alamr,
The University of Wollongong

Dear Mr. Abdullah,

With reference to the request you submitted to the Research Center at the Institute of Public Administration (IPA) to implement your study “Digital Games and Language Learning-Effects and Perceptions of ESL Teachers and Learners” on ELC students and faculties at IPA headquarters, I’m pleased to inform you that it has been approved by the Deputy Director General for Research and Consultations.

Kind regards,

Acting Director General of Research Center

[Signature]

Dr. Waseem Alnoaier
Appendix N
Study questionnaire (Arabic version)

الاستبانة:

أولاً: المعلومات الشخصية ومستوى اللغة:

أ. الاسم (الاسم الأول والأخير):
ب. المستوى والفصل:
ج. العمر (18 – 21):
د. متى بدأت الدراسة في مركز اللغة في معهد الإدارة:
    a. الجزء الأول من الفصل الثاني عام 2011/2015
    b. الجزء الثاني من الفصل الثاني عام 2011/2015
    c. الجزء الأول من الفصل الأول عام 2012/2016
    d. الجزء الثاني من الفصل الأول عام 2012/2016
    e. الجزء الأول من الفصل الثاني عام 2012/2016
ه. في أي مستوى بدأت دراسة اللغة في المركز:
    a. المستوى الأول Preparatory
    b. المستوى الثاني Intermediate
    c. المستوى الثالث Elementary
    d. المستوى الرابع Advanced
و. كم عدد الساعات التي تقضيها بالذاكرة أسبوعياً؟
    a. أقل من ساعة أسبوعياً
    b. ساعة أسبوعياً
    c. ساعتين أسبوعياً
    d. ثلاث ساعات أسبوعياً
    e. أربع ساعات أسبوعياً
    f. خمس ساعات أسبوعياً
    g. ست ساعات أسبوعياً
    h. أكثر من ست ساعات أسبوعياً

ثانياً: أنماط لعب الألعاب الإلكترونية (كألعاب البلايستيشن والكمبيوتر والجوال):

أ. منذ كم سنة تقريباً – وأنت تلعب الألعاب الإلكترونية (كألعاب البلايستيشن والكمبيوتر والجوال)؟
    a. لا ألعب الألعاب الإلكترونية مطلقاً
    b. منذ سنة تقريباً
    c. منذ سنتين تقريباً
    d. منذ ثلاث سنوات تقريباً
    e. منذ أربع سنوات تقريباً
    f. منذ أكثر من أربع سنوات
ب. كم يوم تقريباً تقم بألعاب الألعاب الإلكترونية خلال الأسبوع الواحد (كألعاب البلايستيشن والكمبيوتر والجوال)؟
    a. لا ألعب
    b. يوم واحد
    c. يومين
    d. ثلاثة أيام
    e. أربع أيام
    f. خمس أيام
    g. أكثر من سبعين يوماً

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ج. كم ساعة تقضيها بلعب الألعاب الإلكترونية (كألعاب البلايستيشن والكمبيوتر والجوال) خلال اليوم الواحد؟

<table>
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<tr>
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<td>أقل من ساعة واحدة</td>
<td>أقل من ساعة واحدة</td>
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<td>v</td>
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</tr>
<tr>
<td>vi</td>
<td>خمس ساعات</td>
<td>خمس ساعات</td>
</tr>
<tr>
<td>vii</td>
<td>أكثر من خمس ساعات</td>
<td>أكثر من خمس ساعات</td>
</tr>
</tbody>
</table>

ج. أنواع الألعاب الإلكترونية:

- a. ألعاب غنية باللغة الإنجليزية (فيها الكثير من المحادثات والنصوص التي تحتاج لفهمها)
  (مثل: ريزيدنت إيفل، ميتال قير سوليد، ذا سيمز، فاينال فانتسي، أو ما شابهها)
- b. ألعاب متوسطة اللغة الإنجليزية (فيها بعض المحادثات والنصوص التي تحتاج لفهمها)
  (مثل: كول أوف دوتي، تيكين، ألعاب التصميم، فيفا، أو ما شابهها)
- c. ألعاب قليلة اللغة الإنجليزية (فيها القليل جداً من المحادثات والنصوص وقد لا تحتاج لفهمها)
  (مثل: نيد فور سبيد، كاندي كراش، أنقري يبردز، أو ما شابهها)

رابعاً: استخدام التواصل الاجتماعي عبر الإنترنت (المحادثات الصوتية أو الكتابية):

<table>
<thead>
<tr>
<th>الملاحظة</th>
<th>درجة الموافقة أو عدمها</th>
<th>الرسالة المرتبطة</th>
</tr>
</thead>
<tbody>
<tr>
<td>أ. الرواد كإختبار درجة الموافقة أو عدمها على العبادات التالية، وفق المعيار التالي</td>
<td></td>
<td></td>
</tr>
<tr>
<td>أولاً: أً</td>
<td>أؤيد بشدة = ٥، أوافق = ٤، محاذَد = ٣، لا أوافق = ٢، أعارض بشدة = ١</td>
<td>أولاً: أً</td>
</tr>
</tbody>
</table>

(online) a. أنا أتحدث اللغة الإنجليزية كثيراً أثناء اللعب عبر الإنترنت
(online) b. أنا أقرأ الكثير من النصوص (الكتابات) باللغة الإنجليزية أثناء اللعب عبر الإنترنت
(online) c. أنا أستمع إلى الكثير من المحادثات باللغة الإنجليزية أثناء اللعب عبر الإنترنت
(online) d. أنا أكتب الكثير من النصوص (الكتابات) باللغة الإنجليزية أثناء اللعب عبر الإنترنت
خامساً: آراء وتصورات الطلاب:

الرجاء اختيار ما يتناسب معك من العبارات التالية، وفق المعيار التالي:
أؤيد بشدة = ٥
أوافق = ٤
محايد = ٣
لا أوافق = ٢
أعارض بشدة = ١

أ. التعليم والألعاب الإليكترونية:
1. أتعلم كلمات ومصطلحات جديدة خلال لعب الألعاب الإليكترونية.
2. الأصوات والصور والرسومات في الألعاب الإليكترونية تساعدني في فهم المعاني بشكل أفضل.
3. أعتقد أن تعلم اللغة الإنجليزية باستخدام الألعاب الإلكترونية شيء ممتع.
4. من الممكن استخدام الألعاب الإلكترونية لتدريس اللغات الأجنبية بشكل ناجح.
5. أعتقد أن تعلم اللغة الإنجليزية باستخدام الألعاب الإليكترونية شيء ممتع.
6. لعبة الألعاب الإلكترونية تتعلن بمنهج دراسة اللغة الأجنبية قد يكون مفيداً خلال وقت الدرس (الحصة).
7. لعبة الألعاب الإلكترونية تتعلن بمنهج دراسة اللغة الأجنبية قد يكون مفيداً خارج وقت الدرس (الحصة).
8. الألعاب الإلكترونية تتيح لي الفرصة لأطور من لغتي الإنجليزية.
9. أثناء لعبة الألعاب الإلكترونية أشعر وكأنني في بلد يتحدث اللغة الإنجليزية.
10. الألعاب الإلكترونية يعطني أشعر بالرغبة في تعلم اللغة الإنجليزية.
11. أثناء لعبة الألعاب الإلكترونية، أتعلم مهارة الاستماع للغة الإنجليزية (listening).
12. أثناء لعبة الألعاب الإلكترونية، أتعلم مهارة التحدث باللغة الإنجليزية (speaking).
13. أثناء لعبة الألعاب الإلكترونية، أتعلم مهارة القراءة باللغة الإنجليزية (reading).
14. أثناء لعبة الألعاب الإلكترونية، أتعلم مهارة الكتابة باللغة الإنجليزية (writing).
15. أثناء لعبة الألعاب الإلكترونية، أتعلم قواعد اللغة الإنجليزية (grammar).
Appendix O

Focus group questions (Arabic version)

أسئلة مقابلات الطلاب:

1- أثناء لعبك للألعاب الإلكترونية، بماذا تشعر عندما تواجه كلمات أو مصطلحات لا تفهمها؟ وماذا تفعل؟

2- هل تشعر أن العالم الرقمي في الألعاب الإلكترونية يساعدك على فهم معاني الكلمات والمصطلحات الجديدة أم العكس؟ وكيف؟

3- ماذا تشعر أنك تتعلم أثناء لعب الألعاب الإلكترونية؟

4- هل تشعر أن الألعاب الإلكترونية ساعدتك في استخدام وتطوير لغتك الإنجليزية؟ لماذا؟ وكيف؟

5- ما هي أنواع الألعاب التي تعتقد أنها تساعد في تعليم اللغة الإنجليزية وماهي الأنواع التي لا تساعد في ذلك؟

6- لو كنت مدرس لغة إنجليزية، كيف تستطيع استخدام الألعاب الإلكترونية الاستخدام الأمثل في تدريس اللغة؟

7- هل هناك أي آراء أو تفاعلات أخرى على استخدام أو تأثير الألعاب الإلكترونية على تعلم اللغة الإنجليزية؟
الحمد لله الذي بنعمته تتم الصالحات