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THE ROLE OF MASSIVELY MULTIPLAYER ROLE-PLAYING GAMES IN
FACILITATING VOCABULARY ACQUISITION FOR ENGLISH LANGUAGE
LEARNERS: A MIXED-METHODS STUDY

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A Dissertation
Presented to
the Graduate School of
Clemson University

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In Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy
Learning Sciences

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by
Juan Li
May 2019

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Accepted by:
Dr. Danielle C. Herro, Committee Chair
Dr. Faiza Jamil
Dr. Matthew Boyer
Dr. Jacquelynn Malloy

ABSTRACT

Slow vocabulary development and poor comprehension among English Language learners (ELLs) (August, Carlo, & Snow, 2005) have resulted in an academic achievement gap between ELLs and native English-speaking learners in the United States (Klingner, Artiles, & Barletta, 2006; Wilde, 2010). This mixed-methods sequential explanatory research aims to help narrow the academic gap by providing increased engagement and interaction opportunities to ELLs. In this study, I replicated and extended Bourgonjon et al. (2010)'s study identifying the predictive factors of students' acceptance for using video games in the classrooms. A sequential qualitative study with 11 selected participants was conducted to explain how the factors, tested in the first quantitative phase of study, facilitate ELLs' vocabulary growth. I triangulated the results of the two phases and the discussion of the findings to answer my research questions.

Based on the data collected from 371 participants via a web-based survey, I tested the reliability and validity of the adapted survey scale items using inter-item correlations, factor analysis, and internal consistency reliability tests. Then, I formulated and validated path models to test the hypotheses related to relationships among variables. Results from the analysis concluded that the factor of perceived learning opportunity is an important predictors for players' preference for using MMORPGs in the L2 English classroom. The follow-up qualitative study aims to explain why certain factors identified in the first phase were significant predictors that impact players' preference to use MMORPGs to obtain L2 English vocabulary. Evidence shows that game texts and social interactions are major learning opportunities provided by MMORPGs.

I expect that this study, along with further research in this area, will help teachers integrate MMORPGs or related game mechanics into their regular instruction to provide increased engagement and interaction opportunities to English language learners.

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CHAPTER ONE

INTRODUCTION

Statement of the Problem

The percentage of public school students who are English Language Learners (ELLs) in the United States continues to rise, reaching 9.5% (or 4.8 million students) in the fall of 2015 (National Center for Education Statistics [NCES], 2018), However, the academic achievement gap between ELLs and their Native English peers, particularly in reading performance, remains large and persistent (Klingner, Artiles, & Barletta, 2006; Wilde, 2010). Research has found that this gap results from slow vocabulary development and poor comprehension among ELLs, and their unsatisfactory reading performance is partly due to vocabulary limitations (August, Carlo, & Snow, 2005). By definition, vocabulary, or lexicon, refers to the "stock of words in a given language" (Jackson & Amvela, 2007, p.1). Vocabulary is the "heart of language comprehension and use" (Hunt & Beglar, 2005, p. 24), and, as such, numerous studies have suggested that vocabulary knowledge is a predictor of reading comprehension. Based on the consistent research results found by previous studies (Chall, 1978; Davis, 1968, 1972; Klare, 1974; Spearritt, 1972; Thorndike, 1973; Yap, 1979), Nation and Cody (1988) concluded that vocabulary knowledge is "the most clearly identifiable subcomponent" of reading ability (p. 98). Recent studies (Laufer, 1992, 1996, 2010; Liu & Nation, 1985; Ouellette, 2006; Qian, 1999, 2002) have confirmed the positive relationship between vocabulary knowledge and reading comprehension. For example, based on a quantitative study of 74

English as Second Language (ESL) learners with a minimum English vocabulary size of 3000 word families, Qian (1999) found that the learners' vocabulary size (VS) and depth of vocabulary knowledge (DVK) are highly and positively associated, and that both make significant contributions to the prediction of scores on reading comprehension (RC). In their study of 37 secondary students in Singapore, Zhang and Annual (2008) drew a similar conclusion: vocabulary knowledge positively predicts reading comprehension for second-language (L2) learners at 2000- and 3000-word levels.

Given the crucial role of vocabulary knowledge for reading comprehension, it is surprising that even for L2 learners enrolled in higher education, their vocabulary size is less than a quarter of that known by their English-native peers (Laufer & Yano, 2001). This leads to another question: what is the minimum lexical size for L2 learners to adequately understand texts? According to Nation (1990, 1993), knowledge of 5000 word families is generally believed to be the minimal requirement for L2 learners. A word family consists of a base word and all its derivations and inflections (Bauer & Nation, 1993). In another study, Hazenberg and Hulstijn (1996) showed that at least 10,000 base words are needed for a good comprehension of non-specialist texts. Based on the results of a number of previous studies (Hu & Nation, 2000; Laufer, 1989; Laufer & Ravenhorst-Kalovski, 2010; Schmitt, Grabo & Jiang, 2001), Laufer (2013) suggested two thresholds for understanding the necessary percentage of authentic written texts: 5,000 and 8,000 word families, which yield the lexical coverage of 95% and 98% respectively. However, many second language learners feel frustrated when dealing with the overwhelming magnitude of vocabulary learning, and L2 teachers are unsure about how to help their

students (Hulstijn, 2001). Despite the great efforts that have been made to promote second language learners' vocabulary acquisition, no consensus has been reached on the best strategy for helping them do so (Vahdat & Behbahani, 2013). Therefore, more research is needed on effective methods for vocabulary acquisition.

Purpose of the Study

A number of SLA researchers (Hadley, 2001; Rivers, 1968; Wilkins, 1972) have suggested that to master a second language, learners should acquire vocabulary within the context of culture. Leaver and Willis (2004) proposed three basic premises for second language learning: language learning is a complex non-linear process; language is best learned through a variety of comprehensible input and exposure to the target language; and learners need to use the language through interaction. Similarly, Zhao and Lai (2009) identified four key factors for effective second language acquisition, including rich input, adequate use of the target language in an authentic environment for real purposes, quality negative feedback, and individualized instruction. In contrast to the ideal language learning environments proposed by researchers, the paucity of adequate exposure to the target language (TL) and the lack of motivation to use the language in a real environment present considerable challenges for language learners (Zhao & Lai, 2009). Separation from the TL makes "repeating the contents of textbooks in isolated ways" (Suh, Kim and Kim, 2010, p. 371) a typical learning approach for students, especially for those who live in communities where the TL is not spoken. As a result of inadequate exposure to the target language in culturally relevant context, the literacy performance gap between ELLs

and native English speakers in the United States remains unchanged in the past decade (Wilde, 2010).

However, the emergence of "digital natives" (Prensky, 2000)—youths and young adults who are constantly immersed in online platforms and communication technologies—has prompted educators to investigate the huge learning potential provided by digital tools. Several key educational researchers (Gee, 2003; Papert, 1980; Waston, 2007) regard video games as a promising educational tool because they have the ability to put important learning theories and principles into action. In the early 1990s, Hubbard (1991) predicted that language learning by using video games might be an essential component for the future of language education. Such an approach would reflect changing theoretical approaches to language learning. With the evolution of language learning theories from behaviorism and cognitivism to social constructivism (Kolb, 1984), language learning methodologies have experienced a radical shift from a lecture-based form of knowledge transmission to more socially constructive and collaborative approaches, such as communicative language teaching and task-based language teaching (Ellis, 2003; Thomas, 2012). Researchers have found that video games have the potential to foster constructivist approaches to language learning. Shaffer, Squire, Halverson, and Gee (2005) suggested that the social context simulated by the virtual world in video games, together with images, audio and visual platforms, and graphics, create a powerful and authentic learning environment. In a similar vein, Tomlinson and Masuhara (2009) noted that the "rich, engaging, and purposeful exposure to language in use" provided by video games, along with students' ubiquitous access to digital devices, make video games

valuable tools that might address the challenges discussed above in SLA (p. 645). Gee (2003) noted that video games have their own set of "semiotic domains"—or communicative practices that include languages, symbols, gestures, and graphical artifacts—that work in concert to create a contextual environment that helps players elicit the information they need to complete quests. Rankin, Morrison, McNeal, Gooch, and Shute (2009) described video games, especially Massively Multiplayer Online Role Playing Games (MMORPGs), as unconventional language learning tools, because the players are motivated to acquire new vocabulary items and enhance their reading performance in the target language with the purpose of accomplishing the game's goals. Similarly, Turgut and Irgin (2009) described video games as a valuable sites in which children can be exposed to various forms of literacy and multimodality; they assured teachers and parents that by using video games, children are able to enhance their reading and writing skills.

Consistent with the research above, studies have been conducted to investigate why players are able to acquire vocabulary while playing video games. For example, the frequent repetition of vocabulary in video games creates a greater range of opportunities for language learners to employ various strategies, such as guessing from the context, using dictionaries, or asking for help, to comprehend the unknown information (Turgut & Irgin, 2009). Additionally, the contextualized language environment provided by video games not only allows learners to acquire language skills in an authentic setting, but it also provides them with multiple ways to apply these skills in order to complete game activities (Gass, 2001), which has proven more effective than explicit teaching and drill-

and-practice activities that lack attention to individual differences (Filsecker &

Bündgens-Kosten, 2012). Third, online video games, especially MMORPGs, generate

rich communities of practice. A community of practice is defined as a group of people

who share a common passion and goals, and who interact regularly with the aim of

developing their shared body of knowledge and applying it more effectively (Wenger,

2009). However, communities of practice involve more than just acquiring technical

skills or knowledge for accomplishing tasks: members in the communities develop

relationships and a sense of joint enterprise and identity (Lave & Wenger, 1991), while

the communities also develop accumulated knowledge and shared resources for their

members (Wenger, 1998). In the context of gaming, collaboration is integral for players

to achieve their ultimate goals of developing their characters' skills, undertaking

progressive challenges, and consistently improving their status in the game; this can

happen through in-game interactions or through social organizations beyond the game in

which players are able to develop interpersonal relationships through building alliances or

exchanging experiences (Peterson, 2012a). This rich communication may generate

noticing, negotiation of meaning (Long, 1996; Schmidt, 2001), peer scaffolding (Thorne,

2008), enhanced comprehensible output (Rankin, Gold, & Gooch, 2006; Peterson,

2012a), transfer and adaptive discourse management (Peterson, 2012a), and enhanced

understanding of vocabulary (Rankin et al., 2006; Rankin et al., 2009).

This sequential explanatory mixed methods study both draws and builds upon

previous studies to explore ELLs' English vocabulary acquisition in a gaming

environment by conducting a survey study and an in-depth follow-up exploration with 11

purposefully selected participants using interviews and other text-based materials. The

quantitative study, conducted in the first phase, aims to not only address game players'

attitudes towards acquiring English vocabulary through playing MMORPGs, but to also

probe the factors that serve as predictors to players' preference of using MMORPGs to

acquire vocabulary by extending the existing instruments, testing the model fit, and

conducting a path model. The qualitative case study, conducted in the second phase,

elaborated on the statistical results derived from the first phase to further understand why

and how these predictors contribute to players' English vocabulary acquisition in the

gaming world of MMORPGs. This study will first inform educators of the factors that

positively affect players' perception towards using MMORPGs for English vocabulary

learning, and the follow-up deep exploration will provide valuable information of how

and why the facilitative outcomes take place. The results of this proposal study may assist

educators in understanding how to harness video games to meet the various needs of their

language learners.

Research Questions

The guiding research question in the first, quantitative phase of the study is:

RQ1: What factors predict MMORPG players' preference for using MMORPGs

to acquire English vocabulary?

Based on the guidelines for designing an effective survey (Devellis, 2012;

Dillman, Smith, & Christian, 2014; Rea & Parker, 2012) and a close analysis of the

literature, an instrument established by Bourgonjon et al. (2010) on students' perceptions

about the use of video games in the classroom was chosen for the proposed measurement

scales. This selected existing research instrument (Bourgonjon et al., 2010) is an extended model of Davis' (1989) technology acceptance model (TAM), which has been one of the most widely used and empirically validated models in the field of information research (King & He, 2006). TAM model has been affirmed by a variety of tests and studies as a reliable and economic measurement to predict users' attitudes toward technology (Bourgonjon et al., 2010). TAM measurement model developed and validated that two distinct variables, *perceived usefulness* and *perceived ease of use*, are the fundamental determinants of user acceptance for technology. On the basis of the TAM model, Bourgonjon et al (2010) extended the model to investigate the predictive factors of video game acceptance, suggesting that in addition to *perceived usefulness* and *perceived ease of use*, *learning opportunities* is the third predictor on learners' acceptance for video games. The reasons why I based my instrument on that of Bourgonjon et al. (2010) are: 1) there is no existing measurement instrument specifically on MMORPGs and vocabulary learning; 2) their instrument examines users' acceptance of video games in an educational context, in contrast to most TAM-based models that understand video games as merely entertainment; 3) reliability and validity of this instrument has been checked by performing expert reviews, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and Cronbach's alpha coefficients with a large sample size (N = 858); and 4) the authors provided explicit definitions of each construct followed by theoretical and empirical backgrounds.

Based on my research purpose and a close examination of the TAM model and its extended versions, I plan to keep the following predictive variables established by

Bourgonjon et al. (2010): *usefulness, ease of use*, *learning opportunities*, and *experience*.

The dependent variable will be *preference of using MMORPGs for vocabulary learning*.

Demographic factors and prior English knowledge were regarded as control variables. A

number of studies (Bolliger, Mills, White, & Kohyama, 2015; Suh, Kim, & Kim, 2010;

Sundqvist & Sylvén, 2014) have claimed that gender is closely associated with gaming

habits and language learning performance; however, other studies (e.g. Fengfeng, 2008;

Papastergious, 2009) refute these results, suggesting that there is not a direct relationship

either between gender and learning performance or between gender difference and

preference for video games (Bourgonjon et al., 2010). In addition, empirical evidence

(Suh, Kim, & Kim, 2010; Yang & Hsu, 2013) demonstrated a strong association between

students' prior English knowledge and learning results through MMORPGs. Age has also

proven to be a moderating digital learning acceptance (Wang, Wu, & Wang, 2009). Since

there is no consensus about gender, age and prior English knowledge, they were regarded

as control variables in this study.

Based on the factors tested from the statistical results, the guiding research

question in the second, qualitative phase of the study was formulated as:

RQ2: Why are the factors, tested from the first phase of study, significant

predictors of players' preference for using MMORPGs to facilitate English

vocabulary acquisition?

The specific research sub-questions for the second qualitative phase are:

Sub-question 1: Because of gameplay, how do MMORPGs enhance ELL

players' English vocabulary growth?

Sub-question 2: How do MMORPGs provide sufficient learning opportunities for ELL players to obtain English vocabulary?

Sub-question 3: How can educators integrate MMORPGs into L2 classroom instruction to promote language learning outcomes?

Definitions and Terms

Video games, also called **computer games or digital games,** refers to any of the various interactive games played using a specialized electronic gaming device or a computer or mobile device and a television or other display screen, along with a means to control graphic images (Video Games, n.d.).

English Language Learners (ELLs) refers to students who have limited proficiency in English, who often come from non-English-speaking backgrounds, and who typically require specialized or modified instruction in both the English language and in their academic courses (English Language Learner, 2014).

English as a Second Language (ESL) is also called English as a Foreign Language (EFL). The term "ESL students" refers to non-native English speakers who are learning English.

Computer-Assisted Language Learning (CALL) refers to "the search for and study of applications of the computer in language teaching and learning" (Levy, 1997, p.1).

Second Language Acquisition (SLA), also called **Second Language Learning**, **L2 acquisition** or **L2 learning**, refers to the process by which people learn a second language once the first language is established.

L1 refers to the First Language learned, or a person's mother tongue.

L2 refers to the Second Language learned, meaning another language learned in addition to the person's native language.

Theoretical Perspective

Evolving from Interactionist approaches that stress the importance of conversation and the *Input Hypothesis*, Long and supporters of the *Interactionist Hypothesis* (e.g. Gass, Mackey, & Pica, 1998) argue that interaction is the most important process for L2 learners to acquire language data. Ellis (1999) defined interaction as "interpersonal activity that arises during face-to-face communication" and "intrapersonal activity involved in mental processing" (p. 3). In Computer Assisted Language Learning (CALL), the interaction between the learner and the computer/network also belongs to the category of interaction (Chapelle, 2005).

Two types of interaction are identified from psycholinguistic interactionist literature (Peterson, 2010). The first type is negotiation of meaning, which occurs to solve communication problems by using strategies such as clarification checks, confirmation checks, and comprehension checks. Learners negotiate meaning by noticing the modified input and producing modified output during interaction when communication breakdowns take place (Swain, 1985). This conversational and linguistic exchange brings about the acquisition of the target language because learners are able to comprehend the input and transform this input into intake through noticing (Schimidt, 1990, 1994, 1995). Researchers (Ellis & He, 1999; Ellis, Tanaka, & Yamazaki, 1994; De la Fuente, 2002) who specifically looked at the lexical aspects of SLA found that negotiation of meaning

is beneficial for vocabulary acquisition. The other type of interaction is corrective feedback, which exposes the learners to the linguistic problems they create. There are various types of corrective feedback, including explicit correction, recasting, clarification requests, metalinguistic clues, elicitation, and repetition. These two types of interaction have been researched by a number of SLA researchers (Chapelle, 2005; Gass, 2003; Long, 1996; Picca, 1994) as beneficial tools to enhance learners' cognitive reconstruction of the target language.

Drawing on psycholinguistic perspectives and design features of MMORPGs, Peterson (2010) summarized the potential advantages of using MMORPGs to facilitate second language acquisition: adequate exposure to the target language and real-time feedback in an authentic environment through multiple communicative approaches provide opportunities for negotiation of meaning and corrective feedback; access to worldwide interlocutors enhance learners' communicative competences and social abilities; and learner-centered interaction enables more engagement.

Sociocultural theories informed by Vygotsky (1978) emphasize the social nature of learning. They have been utilized as theoretical rationales for second language acquisition in an extensive body of literature (Firth & Wagner, 2007; Lantolf & Appel, 1994; Lantolf & Thorne, 2006; Lee & Smagorinsky, 2000; Nassaji & Swain, 2000). Vygotsky (1978) claimed that any kind of cognitive development originates externally on an inter-psychological plane in the form of social interaction, which is then internalized on an intra-psychological plane as inner speech. The scaffolding involved in this social interaction gives rise to the operation of the Zone of Proximal Development (ZPD), in

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which the most powerful learning happens (Thompson, 2013). ZPD refers to the difference between what a child can accomplish independently and what a child can accomplish under assistance (scaffolding) from a more capable person, and this assistance can be provided by adults as well as peers. Sociocultural theory advocates for integrating the traditionally dichotomized cognitive and social domains by proposing that human beings' mental processes and their social activities and artifacts are not only interrelated, but also, to a large extent, determined by one another (Lantolf, 2000a). Mediation, which is considered the central and most distinguishing concept of sociocultural theory (Lantolf, 2000a), explains how individuals develop their higher mental activities through the consistent dialogues between their cognitive and social exercises. According to Vygotsky (1987), human beings employ tools and labor activity to regulate or mediate their action on the world. Tools, as artifacts created by human culture and history, could be in any physical and symbolic forms, such as languages and signs.

Drawing on this theoretical framework, recent neo-Vygotskian SLA researchers (e.g. Firth & Wagner, 1997; Lantolf, 2000; Lantolf & Appel, 1994) have criticized current practices in SLA that heavily underline the individual's cognition by profoundly disconnecting language from the social and contextual environment, even in studies that involve social discourse. Instead, these researchers claim that second language learning is a process of co-construction of meaning in the target language, which may occur through social interaction and operation of the ZPD (Lantolf & Thorne, 2006). Following Vygotsky, a large number of researchers (e.g. Bruner, 1987; Cole, 1996; Lave & Wenger,

1991; Wertsch, 1998) have also suggested that learning is a social discourse, in which social interaction is the key to co-constructing knowledge.

However, Platt & Brooks (1994) have argued that the so-called "acquisition rich environments" created by traditional classrooms may not generate the most effective second language acquisition, because the language activities adopted in the classrooms do not encourage regulatory and purposeful communications other than propositional information exchanges. Thorne (2008) proposed that interaction generated by online games may foster a really acquisition rich environment that creates a ZPD through intentional dialogues and co-construction of meaning in the target language.

The *Interactionist Hypothesis* and sociocultural theories discussed above have served as the foundation for much of SLA research. However, over the past two decades, second language researchers have extended these theoretical frameworks, gradually turning away from focusing on the subconscious and cognitive process within the mind of individuals to the socially interactive process of language development. Both of these theoretical frameworks suggest that interactive activities promote language skills by focusing on different but complementary perspectives. While the *Interactionist Hypothesis* solely focuses on the negotiation of meaning, sociocultural theory investigates social interactions in general and stresses the co-construction of knowledge through language activities.

The revolutionary advancement of digital technology, accompanied by the emergence of new learning sciences, stretched the theoretical frameworks discussed above to Digital Game-Based Learning (DGBL). Leading DGBL scholars (e.g. Aldrich,

2004; Gee, 2003; Johnson, 2005; Prensky, 2006; Squire, 2011; Steinkuehler, 2008) have

produced a large body of literature demonstrating the cognitive benefits of playing digital

games. Gee (2013) proposed that the optimal learning of human beings happens through

well-designed experiences in a social context, which can be provided by digital media in

popular culture. As for language acquisition, he argued that the meaning of language is

not some abstract propositional representation that resembles a verbal language. Rather,

meaning in language is tied to people's experiences of situated action in the material and

social world. Gee's theories have been applied extensively in current game-based SLA

research with the purpose of investigating whether or how video games create an

intriguing real-world environment to engage language learners to complete game tasks

that require social interaction (Bryant, 2006).

CHAPTER TWO

LITERATURE REVIEW

This chapter provides a comprehensive review of the literature on video games and second language learning. First, it describes the sources of the literature and the selection criteria. Then, it presents a brief description of the development of Computer-Assisted Language Learning (CALL) and its connections to SLA. The connection between CALL and SLA is included because theoretical frameworks of SLA lay foundations for the applications of CALL. Next, definitions of video games are discussed because that is the primary concept in this research. It is necessary to review the controversies and various emphases proposed in the literature and clarify the perspective adopted by this study. The following section of this chapter focuses on the facilitative roles played by video games for language learning. It starts from a review of studies on attitudes, with the purpose of examining perceptions of various groups of people towards using video games for acquiring language knowledge. Then, a review of comparative studies between formal language instruction and game-enhanced instruction is conducted in order to examine the strengths of game-enhanced language learning approaches. Despite the limited research available, a focused examination of video games promoting L2 vocabulary acquisition is presented. The final section of the literature review thoroughly explores how one of the most popular game genres, MMORPGs, can be utilized for language learning, because the purpose of this study is to demonstrate the implications of using MMORPGs for language instruction. In exploring these topics of research, I address gaps in the literature and the rationale for this dissertation study.

"Video games," "computer games," or "digital games," and "MMORPGs," were used in consistent combination with each of the following: second language acquisition or learning, English as a second language, and vocabulary acquisition or learning. Academic Search Complete, ERIC, Education Research Complete, Education Full Text (H.W.Wilson), Professional Development Collection, Teacher Reference Center, and Google Scholar were adopted as the major databases to search for articles. After skimming the titles and abstracts, full versions of the potentially relevant articles were retrieved.

Articles in this study were included only if they were manuscripts published in peer-reviewed journals and books. Due to the limited number of empirical studies in this field, studies included are not restricted by scales, duration, or research methods, but must be empirical studies published within the last 10 years (2008-2018). For practical reasons, all of the articles must be written in English, although the studies could have taken place in any cultural contexts with participants of any nationality. Articles without full text available and nonacademic resources are excluded from this research.

Computer-Assisted Language Learning (CALL)

CALL emerged in the 1960s along with early computing technology, and it has developed vigorously during the intervening years (Thorne & Smith, 2011). SLA researchers (e.g. Chapelle, 2009; Payne & Whitney, 2002; Stockwell & Harrington, 2003; Thorne, 2008; Thorne, Black & Sykes, 2009) in CALL have integrated a variety of SLA theoretical approaches to inform the pedagogical implications of technology use for language education. For instance, Chapelle (2009) grouped 4 general theoretical

perspectives of SLA—cognitive linguistic perspectives, psycholinguistic perspectives, language in social context, and human learning—to illuminate how SLA theories can be used to enhance CALL research and practices.

Empirical studies have also been conducted to investigate whether and how modern technologies facilitate second language learning. A review study conducted by Zhao (2003) presented research on the effectiveness of technology use in second language instruction between 1997 and 2001. The large mean effect size of this meta-analysis indicated that applications of technology have very positive impact on all aspects of language education. He concluded that modern technology can enhance the effectiveness of language education by eliciting more authentic communications, high-quality input, and useful feedback. It is noticeable that this literature also showed a shocking lack of studies on technology use for language education in K-12 classrooms, which might indicate an underutilization of technology in language education at the pre-college level or researchers' lack of interest in investigating this field. In addition, Zhao suggested that future research needs to address the implementation of multiple technologies and the effective utilization of technology.

Parmaxi and Zaphiris (2017) reviewed 41 published empirical studies from 2009 to 2013 on the use of Web 2.0 technologies in the field of CALL. These studies were selected from four top-ranked CALL journals (Smith & Lafford, 2009): *Language Learning and Technology*, *CALICO Journal*, *Computer Assisted Language Learning*, and *ReCALL*. They concluded that Web 2.0 technological tools effectively support a number of language skills, including writing, intercultural awareness, speaking, and autonomous

learning. In addition, they found that the top-researched Web 2.0 tools were blogs and wikis; social constructivism was the top SLA theory employed by researchers. However, they strongly argued that a large portion of studies did not provide any grounded theoretical frameworks, which might result from the difficulty of connecting the learning theories with real educational contexts. This review also addressed the research gap of learning effectiveness in the field of CALL.

Video Games

The video games industry began in the early 1960s with the creation of *Spacewar!* by an MIT student named Steve Russell (Graetz, 1981). Since then, the video games industry has been continuously evolving, becoming one of the fastest growing industries in the United States (Johns, 2006). In 2010, it brought in an economic gain of more than 25 billion dollars, which considerably surpassed Hollywood's 2010 box offices sales in the United States and Canada (Motion Picture Association of America, 2011). According to the Entertainment Software Association (ESA) (2015), there are 155 million Americans who play video games—42% of whom play video games at least 3 hours per week—and the average age of players is 35. The cultural importance of video games is already greater than that of movies and even sports (Aarseth, 2001).

Since the 1980's, the rapid development of the video game industry has increasingly drawn the attention of academics to the study of computer-based play environments (Egenfeldt-Nielsen, Smith, & Tosca, 2015). After 40 years of research, the study of video games has moved from a marginal place to a central point within the field of digital media, evolving from a field with a paucity of both researchers and readers into

the most popular field of study (Wolf & Perron, 2003). Newman (2013) proposed that the huge size of the video games industry, its popularity, and its demonstration of human-computer interaction are three reasons why video games deserve a serious investigation.

However, although a number of researchers have attempted to provide a comprehensive definition of video games, there is no consensus agreed upon by all scholars (Newman, 2013). Salen and Zimmerman (2004) defined a game as "a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome" (p. 80). Frasca (2001) defined video games as "any forms of computer-based entertainment software, either textual or image-based, using any electronic platform such as personal computers or consoles and involving one or multiple players in a physical or networked environment" (p. 4). Based on academic works on *game*, *play*, *interactivity*, and *narrative*, Esposito (2005) proposed a brief definition of video games as "a *game* which we *play* thanks to an *audiovisual apparatus* and which can be based on a *story*" (p. 2). While this definition includes all of the essential elements that make up video games, it is oversimplified and does not adequately explain the various categories of each element. Some researchers (e.g. Fabricatore, 2000 Gee, 2007; Granic, Lobel, & Engels, 2014; Johns, 2006) have stressed that the interactive nature and players' active engagement are the most distinguishing features of video games. For example, Gee identified video games as "complex systems composed of rules that interact" (Shapiro, 2014). Researchers' constant need to define video games might be due to the vast number of genres and dimensions that they offer (Granic, Lobel, & Engels,

2014) and the dramatic evolution of video games as they become increasingly social, complex, diverse, and realistic (Ferguson & Olson, 2013).

Nevertheless, despite the debates and controversies spurred by the different definitions of video games, there is some common ground shared by researchers. After closely observing various definitions, Wolf and Perron (2003) proposed four distinguishing elements of video games: *graphics*, *interface*, *player activity*, and *algorithm*. They described *graphics* as movable visual images on an electronic screen under control and *interface* as a junction device between players and the game that invites player activity to take place, such as mouse, speaker, screen and etc. They proposed that *player activity* includes both physical and mental activities conducted by both players and their avatars by using the interface, while *algorithm* consists of a series of procedures, including representations of the game's graphics and sound, responses and reactions to the situations within the game, rules of the game, and randomness that add more variations to make the game more interesting.

Providing the most comprehensive definition of video games is not the intention of this research, yet an adequate understanding of what video games are is important because this dissertation takes an in-depth investigation of players' experiences with and perceptions of video games. This research will adopt Yudintseva's (2015) perspective that a "video game is a goal-directed challenging interaction governed by a set of rules and feedback" because this definition synthesizes the fundamental features of video games proposed by leading scholars in the field (Gee, 2005; Malone, 1981; Peterson, 2013; Prensky, 2001b).

The connection between rule-bound games and human learning has been identified in early works of educational research. Piaget (1961) proposed that the socialization associated with rule-governed games promotes children's cognitive development. Since the 1980s, the rise of the video game industry has prompted increasing exploration of video games' learning potential from a variety of theoretical perspectives. Peterson (2013) summarized an extensive body of theoretical work on the connection between computer games and human learning from the perspectives of games studies (Crawford, 1984; Frasca, 1999; Juul, 2005; Prensky, 2001, 2002, 2005, 2006; Salen & Zimmerman, 2004), the digital media studies (Gee, 2003, 2005, 2007, 2007), and literacy studies (Gerber 2009; Jenkins 2006; Kist 2004; Kress, 2003; Lankshear & Knobel, 2006; Sanford & Madill 2007; Steinkuehler, 2004, 2006, 2007, 2008a, 2008b). As one of the leading contemporary game theorists, Prensky (2001, 2002, 2006a, 2006b) has attempted to explore the central roles of play and fun in cognitive development. Prensky (2001) identified the elements of computer games, including *rules*, *goals and objectives*, *outcome and feedback*, *challenge*, *interaction*, and *story*, that can facilitate learning, and he argued that the engagement and pleasure produced by these elements are characteristics of learning in the flow state. On the other hand, digital media theorist Gee (2003) identified 36 learning principles during the process of playing video games, and he proposed that these principles enable an effective learning context in which deep learning takes place. Gee's research is grounded in the perspective that learning is a situated, cultural, social, and embodied experience, not an exclusively individual and inner response to the external world or a purely cognitive storage of concepts (Gee,

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2009). He suggested that humans learn optimally through well-designed experiences in a social context, which can be provided by digital media. For him, good video games are able to provide this learner-centered, immersive learning environment, which engages the learners to actively interact, co-construct, and systematically solve problems. Finally, researchers (Jenkins, 2006; Kress, 2003) in the field of new literacy have adopted a sociocultural perspective to understand literacy as a complex historical, cultural, and social practice. Computer games are understood as a new form of language and are believed to foster literacy development (Kist, 2005). For example, Steinkuehler (2006, 2007, 2008a, 2008b) conducted extensive research on literacy practices of players in MMORPGs. She strongly argued that the combination of fantasy and realism, along with the rich narrative elements of MMORPGs, yield rich socializations that in turn foster players' writing and communication skills. She further explained that multiple factors in MMORPGs—such as in-game communication, out-of-game discussion, collaboration, scientific reasoning for hypothesis testing, adapting existing games, and apprenticeships between players—are eliciting literacy acquisition.

This section has presented a comprehensive picture from a variety of theoretical perspectives and demonstrated the rich educational potential of video games, along with the need to design application principles for learning instructions.

Connections between Video games and SLA

The increasing research on the educational potential of video games has also stimulated widespread interest in using video games for second language acquisition.

Research on attitude towards video games and SLA. Attitude, which is defined as the "learned pre-disposition to respond in a consistently favorable and unfavorable manner with respect to a given object" (Fishbein & Ajzen, 1975, p. 6), affects the implementation of an instructional strategy. A number of SLA studies have investigated the attitude or preference of various groups towards utilizing video games for language learning, with the purpose of effectively implementing game-based learning in classrooms (Mifsud, Vella, & Camilleri, 2013).

Based on the self-reports of 20 Taiwanese pre-service teachers after they played an adventure video game called *Back to The Future* (*BTTF*) one hour per week for 12 weeks, Chen, Chen, Chen, and Yang (2012) found that teachers believed that video games can foster second language acquisition, and they are especially useful for receptive skills, such as reading, listening, and vocabulary knowledge. In order to identify the discrepancies between teachers' and leaners' attitude, Chen and Yang (2013) conducted another survey study on learners' (N = 35) attitude towards another adventure video game, *BONE*. They concluded that students held a similarly positive attitude towards video games in facilitating their English skills. However, both studies implied that the level of language difficulty in the game and game design are crucial factors affecting the language learning results.

In order to include all "stakeholders'" attitude towards video games and learning, Mifsud, Vella, and Camilleri (2013) designed three questionnaires for students (n = 1163), teachers (n = 149), and parents (n = 783) in Malta on their opinions towards video games in education. The results showed that most students, teachers, and parents believed

that video games are helpful for learning, in spite of the fact that the majority of parents only agreed with the learning potential provided by educational games. This attitude survey does not specifically focus on second language acquisition, but a sub-study included in this research demonstrated positive language results facilitated by video games.

Given that qualitative data helps confirm or disconfirm the quantitative evidence, Wu, Richards, and Saw (2014) conducted a concurrent mixed-methods research to investigate the perceptions and motivations of casual gamers, or non-gamers (N = 19), after one hour's session of playing *EverQuest2* (*EQ2*) (Sony Online Entertainment, 2004). They found that most of the non-gamers showed positive attitude and learning expectations towards the game, although some participants complained about the inconveniences brought by the all-English interface and the unfamiliar game jargon.

The majority of the existing literature demonstrates that various groups of "stakeholders," including learners, educators, parents, gamers, and non-gamers, hold optimistic attitudes towards video games for language learning, although to different extents. For example, parents only believe that educational games have learning potential (Mifsud, Vella and Camilleri, 2013), and male participants are more willing to utilize video games than female participants (Bolliger et al., 2015).

Given the positive perceptions of using video games for second language instruction, some researchers are interested in probing predictive factors contributing for students' preference for video games. For instance, Bourgonjon, Valcke, Soetaert and Schellens (2010) proposed that that students' perspectives affect instructors' integration

of instructional technology. Defining preference for video games as "positive feelings about games for learning and predicted choice for video games in the classroom" (p. 1147), Bourgonjon et al. proposed a path model on the basis of an extension and validation of the technology acceptance model (TAM, Davis, 1989) to predict students' preference for video games. They then empirically tested 858 secondary school students. Their results showed that *usefulness*, *ease of use*, *learning opportunities*, and *gaming experiences* directly affect students' perceptions on utilizing video games in language classrooms. Bolliger, Mills, White, and Kohyama (2015) modified this questionnaire and conducted an extended study in a Japanese private university on students' (N = 222) perceptions. The researchers surprisingly found that even in a teacher-centered educational context in which teachers are highly respected as the only experts (Davis & Ikeno, 2011), students demonstrated great enthusiasm toward using video games in English language learning, which may "minimize the role of the teacher and place greater control of the learning processes in the hands of the students" (p. 394). They confirmed the findings by Bourgonjon et al. (2010) and added academic major as another predictive factor. In addition, they noted that the students most frequently perceived enjoyment and motivation as advantages in gameplay. These studies are of significance in that they pointed out the heterogeneity of video game consumers, and they developed the traditional TAM model. However, both studies regarded video games in general, without making a distinction between different types of video games. Also, the mere descriptive statistical summaries and pairwise differences conducted by Bolliger et al. (2015) are not vigorous enough.

Effectiveness of using video games for language education. In addition to research on investigating attitude and preference, a number of scholars (e.g. Peterson 2010; Suh, Kim and Kim, 2010; Sundqvist & Wiktröm, 2015; Thorne, Fischer, & Lu, 2012) have focused on comparative studies between traditional classroom instruction and game-enhanced instruction for second language education.

A mixed-methods study (Neville, Shelton, & McInnis, 2009) on German vocabulary acquisition showed that learners who were exposed to the video game performed better in vocabulary retention and transfer than those who used print-based materials, despite the fact that students perceived the traditional materials satisfactory and more relevant for learning objectives. A large-scale experimental design of study (N = 302) undertaken by Korean researchers Suh, Kim, and Kim (2010) also found that students who participated in MMORPGs-based learning obtained higher scores in English listening, reading, and writing skills than those who received traditional face-to-face instruction. Furthermore, they also identified prior knowledge, motivation, and network speed as the most influential variables in their learning.

Sundqvist and Wikström (2015) examined the relation between out-of-school video gameplay and L2 English measurements on Swedish ESL students (N = 80). Based on the data analysis of a questionnaire, students' written assignments, and English vocabulary test scores, they found that the group of frequent gamers—those who played games more than 5 hours per week—achieved higher grades in both essay writing and vocabulary tests than both groups of non-gamers and moderate gamers who played games less than 5 hours a week. Another qualitative interview study (Sundqvist, 2015) on a 14-

year-old Bosnian boy's experiences of learning English mainly through video games demonstrated how the intrinsic motivation provided by video games impacts L2 learning. These two most recent studies confirmed the positive correlations between gameplay and L2 learning proposed by previous studies.

Besides in-game learning, some researchers (e.g. Chik, 2014; Ryu, 2010, 2013) are interested in investigating the learning potential that extends from video games. A recent 12-month exploratory multi-phase case study on 10 Chinese-speaking university students undertaken by Chik (2014) examined the autonomous learning practices of learning L2 within communities. One of her findings is that gamers scaffold each other by taking on instructional roles in online discussion, such as providing tutorials and game strategies, and translating in-game texts, which form the "funds of knowledge" for L2 gamers (Moll, Amanti, Neff, & Gonzales, 1992). "Funds of knowledge" refers to "the historically accumulated and culturally developed bodies of knowledge and skills essential for household or individual functioning and well-being" (Moll et al., p. 133). Chik concluded that the "affinity space" (Gee, 2003), in which people are drawn together by shared interests, elicits a rewarding environment for fostering autonomy in L2 learning.

Before the actual implementation of video games in classrooms, an examination of the willingness to communicate (WTC) is crucial for effective L2 education (MacIntyre, Dörnyei, Clément, & Noels, 1998). In a recent interview study on five ESL college students in Thailand, Reinders and Wattana (2015) demonstrated that digital games lowered students' anxiety about using the target language and enhanced their

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WTC. However, the small sample size, the self-reported nature of interviews, and the unique cultural context may make their findings ungeneralizable to a larger population.

Controversies of using video games to facilitate L2 learning. Worth noting are a number of research results that disagree with the benefits of playing video games for L2 learning, at least for some aspects of the learning objectives. These studies are included because they indicate that research in video games and learning is still in its infancy and requires additional high-quality investigations.

For example, in one section of a study by Rankin, McNeal, Shute, and Gooch (2008), vocabulary test scores of participants (n = 6) who received three hours' of traditional classroom instruction far outweighed those of another six advanced ESL Chinese students who played *EQ2* for four hours. In a subsequent mixed-methods study at a liberal arts college in the southern United States, Rankin et al. (2009) randomly divided 18 ESL Chinese participants into three groups: one group of students (n = 6) attended three hours of classroom instruction, one group (n = 6) played *EQ2* alone for four hours, and another group (n = 6) teamed with native English speakers and played *EQ2* for four hours. Both the vocabulary post-test scores in the game context and the subsequent content analysis confirmed their hypothesis that in-game social interactions between native and L2 learners accommodate L2 vocabulary acquisition. However, students who received traditional drill and rote practices achieved significantly higher post-test scores (M = 54.78/100) in *sentence usage* assessment than both groups in which students played *EQ2* alone (M = 16.16/100) and than ESL students who were paired with native speakers (M = 13.10).

While both studies provided strong evidence that video games can serve as effective informal L2 learning tools, they revealed that traditional vocabulary instruction is at least more effective for certain learning objectives. However, neither of the two studies articulated the traditional instructional strategies utilized for the control groups. As a result, it is difficult to make a generalization about which learning strategy is more beneficial. Also, the very short duration of both experiments may not guarantee the reliability of the results.

In the language acquisition domain, incidental vocabulary learning refers to acquiring vocabulary as a byproduct through listening, reading, or writing activities, which are not geared toward explicit lexical information; intentional vocabulary learning refers to the activity of explicit vocabulary introduction (Hulstijn, 2001). In gaming environments, vocabulary may be acquired as a byproduct of playing the game or communicating with others (Sundqvist, 2015). In spite of an abundant body of literature (Coady, 1997; Ellis, 1994; Hatch & Brown, 1995; Huckin & Coady, 1999; Nagy & Anderson, 1984; Nation, 1990; Schmidt, 1994; Shu, Anderson & Zhang, 1995) that stresses the effect of incidental vocabulary acquisition, some researchers (Hulstijn, 2001; Krashen, 1989; Singleton, 1999) take issue with advocating for incidental vocabulary learning at the expense of intentional vocabulary learning.

To compare the effect of these two vocabulary learning strategies in a gaming environment, Chen and Yang (2013) divided 22 Taiwanese intermediate-level EFL students into two groups and asked them to play an English adventure game, *BONE*, for about 1.5 hours. One group was suggested (but not required) to take notes, while the

other group was not allowed to take notes. The posttest results showed that both groups achieved vocabulary enhancement, but that there was no significant difference between the two groups, indicating that an intentional note-taking strategy does not outperform incidental vocabulary learning. The researchers also noticed a sharp decrease in the amount of notes throughout the game session, probably due to inconvenience and a lack of motivation. Their study suggested that adopting a note-taking strategy through playing adventure video games is not conducive for learning vocabulary. This study is significant in that it explored implementations of particular vocabulary learning strategies in a gaming context, which implied practical suggestions for teachers. However, a sheer quantitative comparison is not adequate enough to discourage the application of the note-taking strategy. To obtain a deeper insight into how students acquire vocabulary in an authentic and complex environment, descriptive qualitative research emphasizing participants' perspectives is necessary (Bytheway, 2015).

To examine the learning strategy of using supplementary materials for the pedagogical effectiveness of simulation games for ESL learners, Ranalli (2008) carried out a mixed-methods study on nine intermediate-level ESL students from a university in the Midwestern United States. Participants who shared the same language proficiency but different L1 backgrounds were grouped into dyads. They were asked to play *Sims* together with one person as the controller and the other as the manager. The within-subject design rotated the dyads randomly through each of the 3 station conditions: station 1, which included all supplementary materials of vocabulary information, quizzes, cultural notes, and daily game instructions; station 2, which included optional cultural

notes and a link to an online dictionary; and station 3, which featured only game instructions. The quantitative results showed that students in station 1 yielded higher mean scores (M = 8.56) in weekly quizzes than those in station 2 (M = 5.78) and station 3 (M = 6.89), which suggested that supplementary learning materials are helpful for vocabulary learning through playing *Sims*. A subsequent survey study on participants' perspectives revealed that learners believed that supplementary materials are helpful. However, the fact that the mean score of station 3 is higher than that of station 2 makes it hard to conclude whether better learning outcomes are achieved through supplementary materials or the game itself. This study provided valuable pedagogical implications, but due to the unclear role of supplementary materials and a small sample size, more evidence is needed to corroborate its conclusions.

The impact of learner interactivity with the multimedia—which serves as a type of metacognitive strategy (Yudintseva, 2015) on learning outcomes—was also found in the literature (DeHaan, Reed, & Kuwada, 2010; Rankin et al., 2009; Ryan, Rigby, & Przybylski, 2006). DeHaan, Reed, and Kuwada (2010) examined the L2 vocabulary effect of video game interactivity on L2 vocabulary recall in a Japanese university. The participants (N = 80), all of whom were experienced gamers, were divided to forty pairs. One subject of the pair was asked to play a music video game called *Parappa the Rapper 2* (NanaOn-Sha, 2002) for 20 minutes, and the paired subject was asked to watch the game on another monitor. Paired-samples *t*-test statistics on the pre- and post-tests on vocabulary revealed that the players recalled significantly less vocabulary items (*M* = 7.23, *SD* = 4.76) than the watchers (*M* = 21.70, *SD* = 6.94, *t* (39) = 11.63, *p*<.05).

However, a two-week delayed posttest on vocabulary recall indicated that the mean scores of the watchers decreased (from 23.27 to 16.03) much more than the players (from 7.42 to 5.15). This study suggested that the physical interactivity with video games hinders learning due to the additional and unnecessary cognitive load, which confirmed their previous research (DeHaan, 2005) that the interactivity with L2 multimedia is not conducive for language acquisition. It is interesting to note that one study conducted by Rankin et al. (2006) showed that intermediate-advanced level ESL students achieved a 40% increase in vocabulary gains after they interacted with non-player characters in *EQ2*. However, a follow-up study by Rankin et al. (2009) found that students who played *EQ2* alone performed similarly in the vocabulary posttest to the group that received traditional instructions, which was worse than students who were paired with native speakers. These studies suggested that although video games are a rich medium of linguistic information, the learning context and activities are probably more important than the game itself. Also, game genres may restrict the learning outcomes. For example, English is not as crucial for winning in music games as it is in MMORPGs. Additionally, a very short play time may also contribute to poor vocabulary noticing and recall.

Massive Multiplayer Online Role-Playing Games & Second Language Acquisition. As one of the fastest growing genres of video games, MMORPGs, which enable players from around the world to interact with one another, have obtained enormous popularity in recent years. For example, the highly popular *World of Warcraft* (*WoW*) has more than 12 million global subscribers (Bytheway, 2013). A MMORPGs survey indicated that 45% of MMOPRGs players spend more than 20 hours per week on

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MMORPGs, and 80% of MMORPGs players reported that they have spent more than 8 hours continuously playing MMORPGs in one session (Ng & Wiemer-Hastings, 2005). Additionally, based on a three-year longitudinal study on the online survey data collected from 30,000 MMORPGs players, MMORPGs attract people from various age groups (11-68) with an average age of 26.57 (Yee, 2006).

The term MMORPGs was coined in 1997 Richard Garriott, an online game creator, and originated from text-based role-playing games called Multi-User Dungeons (MUD). Wolf and Perron (2003) described MMORPGs as the "first persistent (twenty-four hours a day, seven days a week) worlds" and "the first instance of individualized mediated experiences within a mass audience (each player's experience is unique despite the large amount of simultaneous participants" (p. 11). Dickey (2007) defined MMORPG as "a persistent, networked, interactive, narrative environment in which players collaborate, strategize, plan, and interact with objects, resources, and other players within a multimodal environment" (p. 254). MMORPGs have a number of unique characteristics that distinguish them from other video games and make them the "most interesting innovations in the area of online video gaming" (Hussain & Griffiths, 2009). For example, MMORPGs feature immersive 3-Dimensional graphics interfaces, diverse visual and audio channels for communication, social interactions, and customizable character avatars (Peterson, 2012a). They also require the players to frequently engage in collaboration, competition, and sociability to accomplish game-related tasks (Christou, Law, Zaphiris, & Ang, 2013). Due to these characteristics, the potentially significant educational implications associated with MMORPGs have been examined in a variety of

contexts (Aldrich, 2009; Prensky, 2001b, 2006), including promoting critical thinking, problem-solving and leadership skills (Yee, 2006), supporting collaborative learning for online courses (Childress & Braswell, 2006), and fostering intrinsic motivation (Dickey, 2007).

These distinguishing characteristics make MMORPGs a valuable arena for second language learners (Peterson, 2010a). The ubiquitous and constant conversations taking place through a variety of chat channels are normally text-based in a target language (Steinkuehler & Williams, 2006). Moreover, the topics of the conversation are quite diverse, including game strategies and game characters, adventures of players, politics, and culture (2006). These conversations create valuable opportunities for language learners to use the target language in an authentic and immersive environment.

Rankin et al. (2008) identified three characteristics of MMORPGs that support second language learning: virtual identity, social interactions, and game context. They proposed that MMORPGs provide a less stressful and more forgiving environment to motivate students to communicate with others, ample interactions with native speakers, and an immersive learning environment. Zhao and Lai (2009) asserted that the "legitimate use of human and technological expertise makes MMORPGs optimal language learning environments" due to the massive exposure and feedback, ample practice and testing of the acquired skills in a real setting (p. 408). In addition, distributed learning resources, intriguing collaborative activities, cultural exchanges, democratic environments, and the high level of motivation promoted by MMORPGs all contribute to successful language learning.

For example, Bytheway (2015) identified a flexible combination of 15 vocabulary learning strategies used by the participants through playing *WOW*, including *interacting with players*, *playing in English*, *reading in-game information*, *looking up words*, *noticing frequency/repetition of words*, *requesting/giving explanations*, *equating image/action to word*, *recognizing knowledge gap and selecting words for attention*, *giving/asking feedback*, *noticing in other contexts and adding to existing knowledge*, *guessing from context*, *using word to learn word use*, and *observing players*. After comparing these strategies with those established by current SLA researchers (Gu, 2005; Schmitt, 1997) in formal learning contexts, Bytheway found that formal learning strategies are less comprehensive in the gaming environment. For example, strategies that enable players to play the dual roles of both teachers and learners by *requesting/giving explanations* and *receiving/giving feedback* are largely absent in formal educational settings. This study suggested valuable implications for future research on aspects of vocabulary learning strategies in MMORPG context, but because of the very small sample size (N = 6), the results cannot be generalized to a larger population.

Thorne (2008a) conducted a case study that examined the conversations between a North American and a Ukrainian game player in *WoW*. He observed that both gamers were rested in each other's languages, and that they often switched the roles of instructors and learners for linguistic interaction either in English (mostly) or in Russian. He argued that the multilingual world of MMORPGs provides a natural and active learning environment for L2 learners through peer scaffolding. Another study by Peterson (2012b) on EFL (English as a Foreign Language) students' collaborative interactions in playing

Second Life also produced similarly encouraging results: the large amount of collaborative interactions stimulated by *Second Life* supported participants' practice of the target language (TL) in a less stressful setting. Peterson (2012c) also conducted a qualitative study on four EFL Japanese students to further examine EFL learners' social interaction in playing *Wonderland* and their attitude toward English language learning in MMORPGs by analyzing their text chats and interview questions. He proposed that peer scaffolding in games fosters a conducive environment for the target language production. Learners were found to be less anxious in this enjoyable atmosphere, and their reading and writing skills were enhanced. All of these studies produced positive research outcomes, but they are all limited by small sample sizes and short durations.

In order to improve their gaming skills, some players participate in activities in online communities after they finish playing, forming a "beyond-game" culture (Gee, 2008; Steinkuehler, 2006), and this kind of "beyond-game" interaction is more active and richer than "in-game" interaction (Ryu, 2013). For instance, Ryu (2011) spent 25 months observing and interviewing 20 non-English native speakers to study their multiliteracies learning through interactions with native or more capable peers of English at *Civfantatics.com* (CFC), one of the biggest online communities devoted to *Civilization* (Civ). The author identified traditional, multimodal, multilingual, and multicultural learning moments based on a discourse analysis of their participation in the online space. He argued that multiple literacy practices elicited by online communities are beneficial for both L1 and L2 literacy learning. To further investigate and compare the role of social interactions both in-game and beyond-game, Ryu (2013) conducted a multi-phase

exploratory case study at *CFC* by applying Activity Theory (Engeström, 1987), which refers to a framework explaining how people carry out purposeful collective activities, with the assistance of sophisticated tools in the complex dynamic environments of modern organizations (Hasan, 1999; Waycott et al., 2005). After repeated reviews of the observation data and in-depth interviews, the author concluded that in-game and out-of-game learning environments are interrelated, and while gameplay interaction assists with the acquisition of English words and phrases in a situated context, interaction with more capable peers in beyond-game culture facilitates English discourse development.

Based on the analysis of current studies, it is not hard to conclude that there is a great need for more quality studies on L2 vocabulary acquisition in gaming environments. First, abundant evidence has suggested the positive role of collaborative dialogue on L2 acquisition, but as the "heart" of language, vocabulary learning has not received the attention it deserves. Second, the significant learning potential embedded in video games for L2 acquisition, especially their ability to provide numerous opportunities for interaction, has been proven by numerous studies. With the field's shift in research focus from traditional classroom instruction to technology-mediated language learning, combining video games and L2 acquisition can be an avenue for future research. Third, current studies lean heavily on quantitative research, which may misrepresent the playing process and affective experiences of the participants. At the same time, a number of qualitative study results are limited by small sample sizes, short play duration, an imbalance between participants' genders, and different language levels or gaming experiences, among other limitations. Finally, for various reasons, a number of studies

with similar research questions obtained different, even contradictory outcomes, making it difficult to draw conclusions. Thus evidence from the current studies needs to be further investigated through additional quality mixed-methods studies, with the purpose of making solid generalizations from adequate and solid empirical data.

CHAPTER THREE

RESEARCH DESIGN AND PROCEDURES

The goal of this study is to investigate the potential of using MMORPGs to facilitate ELLs' vocabulary acquisition by exploring players' perceptions and interpreting their learning experiences. This study will illuminate the aspects of MMORPGs that contribute to ELLs' preference for video games and uncover how and why learning takes place while playing the game. In so doing, this study will provide educators with implications that can be employed in their second language instructions.

This chapter will demonstrate the research design utilized in the present investigation, followed by a detailed description and justification of the research methodology, including the recruitment of participants, development of the survey instrument, efforts to ensure its validity and reliability, establishment of the interview protocol, data collection procedures, and methods used to analyze the data.

Mixed-Methods Design of the Research

A research design is a logical plan or "blueprint" that guides the researcher to answer research questions through the process of collecting, analyzing, and interpreting relevant data (Yin, 2014). With the purpose of using the evidence to address my research questions, a mixed-methods sequential explanatory design consisting of a quantitative research study followed by a qualitative one is considered the best fit to answer my research questions (Creswell et al., 2003).

Despite the debates in defining mixed-methods research among scholars (e.g. Creswell & Clark, 2007; Greene, 2007; Greene, Caracelli, & Graham, 1989; Johnson, Onwuegbuzie, & Turner, 2007; Tashakkori & Teddlie, 1998), there is a consensus that mixed-methods research enables researchers to combine the strength of qualitative and quantitative research methods and adopt multiple paradigms, tools, and approaches to obtain a comprehensive and in-depth understanding of the research questions (Creswell & Clark, 2010). The rationale for mixing quantitative and qualitative data within one study is grounded in the facts that one data source is insufficient; initial results need to be explained, generalized, or enhanced; a theoretical lens needs to be utilized; or a study needs to be understood through multiple phases (Ivankova, Creswell, & Stick, 2006). Specifically, an explanatory mixed-methods research design was employed for this study. This research design implies an integration of two consecutive research phases within one study: a numerical data collection and analysis phase followed by a qualitative data and analysis phase to explain and refine the quantitative results (Ivankova, Creswell, & Stick, 2006; Rossman & Wilson 1985; Tashakkori & Teddlie 1998).

Quantitative research methods are typically grounded in a post-positivist paradigm, and they rely on deductive reasoning to test the hypothesis by using data collected from a large sample size (Thorne, 2000). This research method is traditionally characterized as "exhibiting a preoccupation with operational definitions, objectivity, replicability, causality, and the like" (Bryman, 1984, p. 77). These qualities make a quantitative approach appropriate to addressing my first research question. Therefore, an initial statistical study was used to identify the existing predictive factors for students'

preference for using MMORPGs to acquire English vocabulary. The results of this study will provide insight into what my samples of ELLs are looking for in a game that they hope will improve their vocabulary.

In contrast with quantitative methods, qualitative studies are grounded in a constructivist paradigm, which holds that truth is dependent on people's subjective worldviews, and that these subjective views are shaped by their personal experiences as well as their social interactions with others (Creswell & Clark, 2010). Given that the purpose for the second phase of the study was to obtain an in-depth and descriptive perception of the players' actions, a follow-up qualitative study that provides rich, thick descriptions (Merriam, 1998) was employed to explore in great depth the facilitative role played by the predictive factors. Based on my research on the existing literature, more qualitative or mixed-methods studies are needed due to the fact that the majority of the current studies are quantitative, which may ignore the important role that personal experiences and subjective attitudes play in the learning process.

A pilot study with one selected participant was conducted prior to the full-scale qualitative study to assist me with clarifying my qualitative research questions, testing my research methods, testing the strength of my interview questions, and providing a preliminary understanding of the research results (Glesne & Peshkin, 1992). Although there is no clear rule for the sample size of a pilot study, existing literature suggested that a pilot sample should be 10% of the sample for the major study (Connelly, 2008). Given that my proposed sample size of the qualitative study was 12, one participant is considered adequate.

Specifically, a web-based survey methodology was used for the first phase of the study to answer the first research question: What factors are predictors to players' preference for learning vocabulary by playing MMORPGs? The survey method was selected because it allows the researcher to use a subset of the population to make inferences about a very large group, which might be too expensive to study (Holton & Burnett, 1997). Moreover, data obtained from web-based surveys can be easily stored and transformed into numerical form and put into data analysis software (Ivankova, 2002).

A qualitative research approach served to answer the second research question in the second phase of study: How are the factors, tested in the first phase, significant predictors of players' preference for using MMORPGs to facilitate English vocabulary acquisition? This research question was addressed through three sub-questions: 1) How do MMORPGs enhance ELL players' English vocabulary growth?; 2) How do MMORPGs provide sufficient learning opportunities for ELL players to obtain English vocabulary?; and 3) How can educators integrate MMORPGs into L2 classroom instruction? All qualitative data falls into four basic categories: "observations, interviews, documents, and audiovisual materials" (Creswell, 2007, p. 129). Interviews serve as the primary approach to collecting stories and closely examining participants' experiences from various angles (Jacob & Furgerson, 2012). Therefore, in-depth semi-structured interviews with selected participants were conducted to help answer my qualitative research questions. The sampling procedures of the two phases will be detailed later in the "Data Collection" section.

All mixed-methods designs have to deal with the issues of priority, implementation, and integration of the quantitative and qualitative approaches. Priority refers to the fact that a researcher gives more weight or attention to either quantitative or qualitative methods for the purpose of answering the research questions. (Creswell & Clark, 2010; Morgan 1998). This issue is typically determined by the research purposes, the breadth of research questions of each phase, the particular research design of each phase, as well as the interests of the researcher and the emphasis that the researcher intends to seek (Creswell, 2003; Morgan, 1998). In most cases of sequential explanatory studies, the priority is given to the quantitative strand because the quantitative data collection has a major influence on the mixed-methods data collection process (Ivankova, Creswell, & Stick, 2006). In this study, the initial quantitative strand is a broad investigation of which factors of MMORPGs promote students' preference for using MMORPGs to facilitate their lexical accretion, providing the foundation for the second qualitative strand and offereing a profound inquiry into a contextual-based interpretation of the statistical results (Creswell, 1999; Green & Caracelli 1997). In other words, the purpose of the study is to identify and explain the factors that affect players' preference. Considering the study goals, the robustness of the first phase, and the smaller qualitative component of enhancing the depth of the statistical results, I decided to give priority to the quantitative data collection and analysis. Multiple philosophical assumptions will be utilized respectively for each phase on the grounds that qualitative researchers view the world from a constructivist perspective and quantitative researchers measure their results in terms of post-positivism (Creswell & Clark, 2010).

Implementation refers to whether the two stages of study occur in sequence or concurrently (Morgan, 1998). In this sequential explanatory design, the data were collected in two consecutive stages. I first collected the quantitative data using a web-based survey with the purpose of identifying potential predictors for players' preference for using MMORPGs to acquire English vocabulary. Then, I collected and analyzed the qualitative data to explain why these factors are significant and how they work.

Integration refers to the connection and interaction of the quantitative and qualitative methods (Tashakkori and Teddlie, 1998). Determining the level of interaction between the two methods is considered most pertinent to the mixed-methods design (Greene, 2007). Integration of quantitative and qualitative approaches could happen in the early stage of the study when the researchers formulate research questions (Teddlie & Tashakkori, 2003), in the intermediate stage when the results of the initial research phase stage inform the data collection in the second phase (Ivankova, Creswell, & Stick, 2006), or at the final interpretation stage (Onwuegbuzie & Teddlie 2003). In this sequential explanatory study, the quantitative and qualitative phases are connected during the intermediate stage in the research process while selecting the participants for the follow-up qualitative strand from those who completed the surveys in the initial statistical phase. The second connecting point took place when I developed the qualitative interview protocols based on the results of the initial quantitative phase. The third connection happened when the pre-determined code categories for the interview transcript were determined by examining the statistical results. The final integration is the triangulation

of the findings of both quantitative and qualitative research to interpret the outcomes of

the study as a whole.

Phase	Procedure	Product
QUANTITATIVE Data Collection	• Web-based survey (N = 371)	• Numeric data
QUANTITATIVE Data Analysis	• Data screening	• Missing data, descriptive statistics
	• Exploratory factor analysis • ANOVA • Path analysis	• Factor Loadings • Variance • Model fit, path coefficients
	• SPSS quantitative software, v. 25 • *AMOS*, v. 25	
Connecting quantitative and qualitative phases	• Purposefully selecting the participants for the second qualitative study (N = 12) • Maximal variation sampling • Developing interview protocol	• Participants (N = 12) • Interview protocol
QUALITATIVE Data Collection	• Pilot interview with 1 participant • Semi-structured interview Text data with 11 participants	• Modified interview protocol • Text data
QUALITATIVE Data Analysis	• Two cycles of coding • Directed content analysis • Thematic analysis • Theme development • Atlas. Ti 8 qualitative software	• Codes • Categories • Themes • Visual display
Integration of the quantitative and qualitative	• Explanation and Interpretation of quantitative and qualitative results	• Discussion • Implications • Future research

Figure 1. Visual Model for the Mixed-Methods Sequential Explanatory Design Procedures.

A visual model for the research design procedure was created to better illustrate

the multistage format of the mixed-methods procedures used in the study (Ivankova,

Creswell, & Stick, 2006). A graphical representation of the mixed-methods procedures has been encouraged in a large amount of mixed-methods literature (Creswell et al. 2003; Morse 1991; Tashakkori &Teddlie 1998). Using the rules developed by Ivankova, Creswsell, and Stick (2006), I created a graphic representation of the mixed-methods sequential explanatory design procedures for my research study (see Figure 1). Following the example they provided in their illustrative study, the term QUANTITATIVE was capitalized to indicate the priority of the quantitative study. The data collection and analysis procedures and results from each stage are listed. The places where connections and integration of the two phases of research occurred are shown.

In the following section, I will detail the data collection and data analysis procedures of the two phases of study respectively. Data collection and data analysis in both the quantitative and qualitative studies were conducted by following the six steps suggested by Creswell and Clark (2010): 1) preparing the data; 2) exploring the data; 3) analyzing the data; 4) representing the analysis; 5) interpreting the data; and 6) validating the data and interpretations**. I will first describe the data collection and analysis procedures for the quantitative study, and then for the follow-up qualitative study.

Phase One: Quantitative Phase

*Data Collection***. The following section outlines the data collection procedures used in the first, qualitative phase of my study.

Instrument development. The survey consisted of 33 items that solicited responses on 19 Likert-scale items, 5 multiple-choice items, and 10 open-ended items. The 19 Likert-scale items were expected to measure the 5 constructs: *Experiences*, *Usefulness*,

Ease of Use, *Learning Opportunities*, and *Preference*. Among the other 15 items, 6 of them collected demographic information; 7 solicited personal experiences or opinions on learning English vocabulary through playing MMORPGs, 1 collected feedback on the comprehensiveness of the survey. The last question inquired about the possibility of participating in the follow-up interviews.

The 19 Likert-scale question items were adapted from an existing instrument (Bourgonjon et al., 2010). I made moderate changes, such as changing "video games" to "MMORPGs" and "learning" to "learning English vocabulary." I also changed the 5-point Likert scale to 6-point Likert scale. In spite of the widespread use of the Likert (1932) scale for attitude measurement in social research, controversies (e.g. Allen & Seaman, 2007; Borgers, Sikkel & Hox, 2004; Leung, 2011) on the optimal number of scale points have yet to be resolved. A well-cited study by Garland (1991) shows evidence that social desirability bias could be minimalized by removing the neutral point. A more recent study (Chomeya, 2010) suggested that a 6-point Likert scale is preferred to a 5-point Likert scale if a higher reliability and lower deviation of personal decision making are desired, or if an instrument has several variables. However, some research (e.g. Allen & Seaman, 2007) recommended retaining the neutral point for political or sensitive cases to avoid forced choices. By considering the context (Garland, 1991) of this specific research, which aims to investigate predictable variables for the preference of using MMORPGs, I decided on a 6-point Likert scale to obtain ascertainable answers from my respondents. This significant change means that I needed to reexamine the factor structure of the measured variables. I will discuss this issue later in Data Analysis.

The measurement instrument was initially checked through expert reviews. The technique of expert reviews was chosen because it is a relatively inexpensive and time-saving method for identifying and addressing problems in the draft survey questions (Presser & Blair, 1994). Also, studies (Presser & Blair, 1994; Willis et al,. 1999) have found that expert reviews identified different problem types and more problems than other techniques. In this study, a small group of four experts from game-based learning, learning and teaching, and instrument development reviewed the question items. The diversity and interaction of the subject matter experts and the measurement professional helped me to review whether the participants and I could perform the survey study without difficulty (Czaja, 1998). Experts can rely individually on their own judgment and produce comments on the survey questions, or work in group sessions to provide an agreed upon evaluation (Willis et al., 1999). For the convenience of the experts, I asked them to review the survey questions independently, and they provided me with informal and open-ended feedback via emails. I finalized the survey questions with my committee chair after revising based on the experts' feedback.

Finally, I converted the survey to an online format using a web-based survey tool Qualtrics. I selected Qualtrics because of its free access to Clemson students and flexible features. For example, it offers 85 question types, the data can be exported directly to different file types, and respondents can stop in mid-survey and resume later, among other useful features.

Recruitment of the participants. Participants for the survey study were recruited mainly from Reddit, a community-driven online platform. I chose Reddit because of its

potential of high exposure to the communities of gamers. Reddit was established in 2005 with a mission statement of becoming "the front page of the Internet" (Reddit, n.d.). It showed an exponential growth in the past decade and has become one of the largest online communities. As of July 2018, Alexa traffic rank marked Reddit as the 8th and 5th most popular website globally and in the U.S. respectively (reddit.com Traffic statistics, 2018). Currently, there are more than 138,000 active communities and 330 million average monthly active users from all over the world (Reddit, n.d.).

I used a combination of non-probability voluntary sampling and snowball sampling approaches to recruit the participants. Voluntary sampling is used to recruit people who self-select to respond to the survey. My target population is MMORPG players who speak English as a second language, meaning the participants could be very diverse in terms of ages, nationalities, first languages, and locations. I assumed that voluntary sampling approach through online communities was the most practical way to reach my target population. Snowball sampling is also called chain referral sampling, referring to the method that "yields a study sample through referrals made among people who share or know of others who possess same characteristics that are of research interest" (Biernacki & Waldorf, 1981, p. 141). In snowball sampling, the researcher identifies the initial subjects in the population and asks them to recruit more participants into the study. This procedure is replicated until the researcher obtains the desired sample size. Snowball sampling is appropriate for this study because: 1) snowball sampling may elicit large sample sizes with low costs; and 2) the researcher finds it "hard to reach" the desired target population number (Miller & Sonderlund, 2010; Wilson & Laskey, 2003).

Online game forums and social media advertising served as the major resources employed to identify and recruit the initial subjects. Researchers (Baltar & Brunet, 2011; Kosinski, Matz, Gosling, Popov, & Stillwell, 2015) have suggested that incorporating snowball sampling with digital networks enables the researcher to obtain a considerable sample size while also enhancing the response rate and the recruitment performance. Therefore, digital recruitment combined with snowball sampling was considered to be a feasible approach for this study. I identified the initial subjects based on the online exchanges and their survey responses. Then I encouraged them to spread the survey link to people who met the criteria.

Criteria for selecting the participants for the quantitative phase were: 1) they must be English language learners (ELLs), and 2) they must have experiences playing MMORPGs. Participants are not limited by nationalities, first languages, cultural backgrounds, or genders. Participants are assumed to be at intermediate English proficiency level because the challenging game missions of MMORPGs may bring cognitive overload for players of low language proficiency (Yudintseva, 2015).

Sample Size. Four key factors were included for deciding the sample size for the survey study: target population size, margin of error, confidence level, and response distribution (Dillman, Smyth, & Christian, 2014). According to Dillman, Smyth, and Christian (2014), the required sample size does not increase much for populations of approximately more than 20,000. Official sources that identify the number of ELLs who play MMORPGs are not readily available; however, due to the large number of active players of the MMORPG *World of Warcraft* (*WoW*)—estimated to have around 10

million active players as of 2014 (Blizzard Entertainment, Inc. 2014)—the target

population is estimated at more than 20,000. Therefore, the target sample size of 377 in

this study was initially determined by using the formula established by Dillman, Smyth,

and Christian (2014) at ± 5% margin of error and 95% confidence level. On the other

hand, sample size requirement for structural equation modeling (SEM) is also considered

for deciding the number of my participants. Various guidelines for sample size in SEM

have been developed, such as a minimum sample size of 100-200 (Boomsma, 1985) or 10

cases for each variable (Nunnally, 1967). Following guidelines created by Muthén and

Muthén (2002), Wolf et al. (2013) employed Monte Carlo data simulation techniques to

investigate sample size requirements for different SEM models. Based on a systematic

examination on how varied parameters (e.g. number of factors, missing data, factor

loadings, and path coefficients) affect the sample size requirements regarding power, bias

in the parameter estimates, and solution propriety, a sample size of between 30 to 460

cases was determined. Specifically, even for missing data at 20%, a sample size around

320 would suffice. Therefore, the initial decision to obtain 377 participants was not

changed. I finally recruited 371 participants, which is considered a large enough sample

size for the survey study.

As I stated in the literature review, a large number of current quantitative studies

are limited by small sample sizes. Therefore, the large sample size of my study would be

one of its strengths.

Data Analysis. The first, quantitative phase is a replication and extension of a

model constructed by Bourgonjon et al. (2010) on predictive factors of students'

preference of using video games for learning. The quantitative data analyses tests include factor analysis, reliability measurement, descriptive statistics, and ANOVA using Statistical Program for the Social Sciences (IBM SPSS 25) and factor analysis and path analysis using Analysis of a Moment Structures (IBM AMOS 25). The survey data were exported from Qualtrics to IBM SPSS 25. All variables were defined by the parameters. In the data set, males and females were coded as 1 and 2 respectively.

Data Cleaning. Data cleaning is a three-stage process of identifying, diagnosing and correcting faulty data (Van den Broeck, Cunningham, Eeckels, & Herbst, 2005). By following recommendations of Meyer et al. (2013), consistency checks were performed to verify the reliability of data, followed by a frequency table in SPSS to identify missing and erroneous data. Missing data is a problem that virtually no statistical analysis method can avoid, which may result from various reasons. Inappropriate handling of missing data may result in serious consequences, such as bias in the parameter estimates, inaccuracy of confidential intervals, weakened statistical power (Soley-Bori, 2013), and inefficient use of the data (Afifi & Elashoff, 1966). Conventional methods such as listwise deletion, pairwise deletion, and imputation have proven undesirable because they are based on the assumption that data are missing at random (Allison, 2003). Two advanced methods to handle missing data are considered to have good statistical properties for Structural Equation Modeling (SEM): maximum likelihood (ML) and multiple imputation (MI). For this study, I decided to use the ML estimation method to handle the missing data. Instead of filling in the missing data, ML approaches "operate by estimating a set of parameters that maximize the probability of getting the data that was observed" (Newman, 2003, p.

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332). In other words, maximum likelihood estimation uses all available data to identify the parameter values that are most possible to produce the sample data (Baraldi & Enders, 2009). Compared with MI, ML is preferred for handling missing data for SEM (Allison, 2003) for several reasons: ML is more efficient in using data; ML produces the same results for the same set of data; ML is more straightforward and requires fewer decisions; and there are no conflicts between the imputation model and the analysis model in ML (Allison, 2012). I used AMOS 25 to perform ML.

Exploratory Factor Analysis (EFA). Factor analysis was conducted to investigate the construct validity when the relationships among variables were unexplored or not clear (Brown, 2016). Factor analysis is a complex structure-analyzing procedure used to identify the smallest numbers of explanatory constructs or factors that have common characteristics through a data reduction technique (Nunnally & Bernstein, 1994). Specifically, factors or exploratory constructs or latent variables are highly correlated clusters of variables (Field, 2013). The goal of performing factor analysis is to determine the number of latent constructs underlying a set of items and clearly explain the meaning of the observed correlation matrix (Howard, 2016; Suhr, 2006).

The existing scale (Bourgonjon et al., 2010) used in this research has been proven reliable and valid. However, a re-examination of the factor structure is considered necessary due to two major reasons: 1) the scale is moderately modified by rewording "video games" to "MMORPGs" and "learning" to "learning English vocabulary," and the 5-point Likert Scale was changed to 6-point Likert Scale; 2) the demographic characteristics of the samples in the two studies are significantly different. The previous

study by Bourgonjon el al. (2010) was conducted on secondary school students in Flanders, Belgium, while participants of my study are MMORPGs players with diverse demographic characteristics.

Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) are two types of factor analysis, and both can test the validity and reliability of an instrument. EFA is a variable reduction technique used to explore the possible underlying factor structure of a set of observed variables without imposing a preconceived structure on the outcome (Child, 1990). Confirmatory Factor Analysis (CFA) is a type of SEM driven by a hypothesis based on a strong theoretical framework and deals specifically with the relationships between observed measures or indicators and latent variables or factors (Brown, 2016). In other words, CFA allows researchers to statistically test their hypothesis on the relationship between observed variables and the underlying latent constructs. However, the current stage of the study is to develop a new scale by identifying the underlying latent structure of the data instead of testing a hypothesis. Therefore, EFA is considered more appropriate.

The procedure for conducting EFA in this study followed the recommendations proposed by Field (2013). Generally, it included three steps: an initial data screening, the main analysis that determined the number of factors retained, and a post reliability analysis.

Initial Checks. Prior to the extraction of the factors, the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy (Kaiser, 1970) and Bartlett's test of sphericity (Barlett, 1950) were used to assess the sufficiency of the relationship within the data set

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for factor analysis. Kaiser (1974) recommends a KMO value greater than .5 as barely acceptable. This study adopted the most recent recommendation that a KMO Measure of Sampling Adequacy higher than .60 would be considered acceptable (Howard, 2016). Barlett's test of sphericity aims to test whether the correlation matrix is an identity matrix, which means whether the items correlate with each other (Pett, Lackey & Sullivan, 2002). Bartlett's test of sphericity should be significant (p < .05). However, due to the fact that Barlett's test is always significant if the sample size is large, even when the correlations between variables are very small, a visual screen of the correlation matrix and significance table were used to identify items that are too highly correlated (r ≥ .80) or too poorly correlated (r < .30) with each other (Field, 2013; Pett, Lackey & Sullivan, 2002). In factor analysis, the correlation matrix (also termed Factorability) summarizes the relationship among items in a scale, from which the researchers could get an initial sense of the possible item clusters. A weak correlation among items indicates a low shared common variance and would potentially result in too many factors. In contrast, a very high correlation would cause a problem with multicollinearity (Field, 2013). The items that correlated too high (r ≥ .80) or too low (r < .30) were examined and removed.

Following the interrelations check, descriptive statistics were used to make sure that the variables met the assumption of normality and were measured at an interval level (Field, 2013). Frequencies and descriptive statistics including mean, standard deviation, skewness, and kurtosis were run and reported in the tabular form. Mean and mode were used to measure the central tendency of the distribution. The mean describes the average score around a value, and mode demonstrates the number that occurs the most. Standard

deviation of the mean was used to provide a more complete understanding of the mean. Standard deviation of the mean is a measure of variability, which indicates how far the individual responses to a question item disperse from the mean; this allows researchers to understand the spread of the responses. A low standard deviation indicates a small dispersion of the data, while a high standard deviation indicates that the data are spread out. On the other hand, Standard error indicates the standard deviation of the population mean, which was used to estimate the reliability of the sample mean. Therefore, a standard error close to zero is considered a more accurate reflection of the population mean.

Skewness is a measure of symmetry of a variable. If the distribution looks the same to the left and right of the center point, the data set is symmetric; otherwise, it is referred to as skewed. A distribution would be considered significantly skewed if the number is greater than +1 or lower than -1 (Hair, Hult, Ringle, & Sarstedt , 2017). Kurtosis is a measurement to assess whether the distribution of the data are heavy-tailed or light-tailed relative to a normal distribution. The distribution is considered too peaked if the number is greater than +1. Likewise, a kurtosis of lower than -1 indicates a too flat distribution (Hair et al., 2017).

Main Analysis. The main analysis began with data extraction. For the analytic method, Maximum Likelihood (ML) was chosen for this study. ML mathematically determines the factor loading and unique variance estimates that are most likely to have produced the observed data (De Winter & Dodou, 2012). Compared to other methods, ML can provide more information, such as model fit indices shared with SEM. The

retention method of the Kaiser criterion (1960), which suggests that all factors with eigenvalues above 1 should be retained, is used in this study to determine the number of factors.

After the number of factors was decided, the factors were rotated to interpret the individual variable. Oblique rotations were chosen because it allows for the resultant factors to be correlated (Costello & Osborne, 2005; Fabrigar et al., 1999; Hinkin, 1995, 1998). Oblique rotation is highly recommended in social sciences research because factor intercorrelations are normal in social sciences, and even if the factors are not correlated, oblique and orthogonal approaches produce the same results (Costello & Osborne, 2005). Due to the fact that one of the purposes of the current research is to investigate the predictive relations among variables, oblique rotation is considered more appropriate than orthogonal solution. Specifically, a direct oblimin rotation with a delta of zero was adopted due to its satisfactory performance reported by previous research (Browne, 2001; Ford, MacCallum, & Tail, 1986; Hinkin, 1995, 1998).

Factor loading values demonstrate the extent to which each variable represents each factor (Howard, 2016). Variables that represent either multiple factors or no factors are suggested to be removed (Hair et al., 2006). This study employed the .40-.30-.20 rule recommended by Howard (2016), which suggested that satisfactory variables (a) load onto their primary factor above 0.40, (b) load onto alternative factors below 0.30, and (c) demonstrate a difference of 0.20 between their primary and alternative factor loadings.

Post Reliability Analysis. The reliability of an instrument refers to the extent to which scores on an instrument are free from the measurement error (American

Psychological Association, 1985; Pedhazur & Schmelkin, 1991). The internal consistency was used to measure the relative homogeneity among a set of items that make up a subscale or an instrument (Pett, Lackey & Sullivan, 2003). To assess the internal consistency of the questionnaire, Cronbach's coefficient alpha (α) (Cronbach, 1984) was performed to objectively measure the reliability of the questionnaire (Tavakol & Dennick, 2011). A variety of acceptable values of Cronbach's alpha are reported, ranging from .70 to .95 (George & Mallery, 2003; Gliem & Gliem, 2003; Nunnally & Bernstein, 1994). Meanwhile, a maximum value of .90 was recommended to avoid redundancy (Streiner, 2003). A recent study (Taber, 2017) investigating the use of Cronbach's alpha in 69 papers in 4 leading science education journals in 2015 showed that it is a common practice that a value of .70 was considered as a sufficient measure of reliability of an instrument. After a close examination the literature mentioned above, an alpha value higher than .70 was considered as acceptable for this study.

Due to the fact that studies utilizing Likert-type scales will report both overall scale and subscale internal consistency reliability estimates (Gliem & Gliem, 2003), reliability analysis on the generated subscales were conducted respectively.

Each time when an item was deleted, I re-conducted the EFA.

Figure 2 shows the procedure for conducting EFA by following Field's (2013) example.
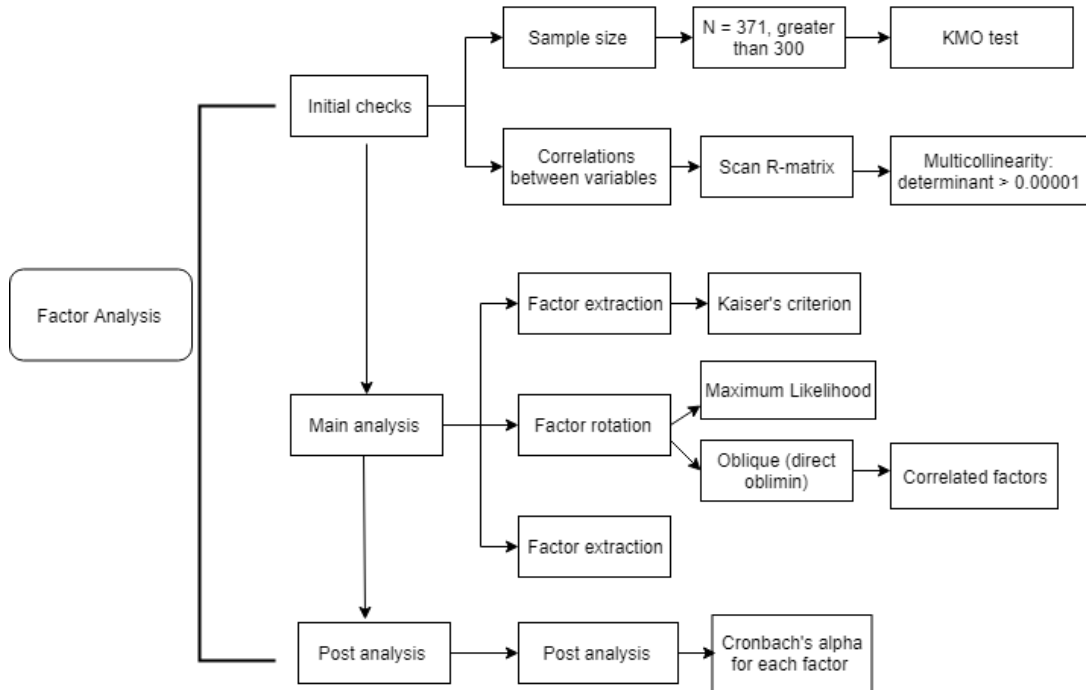
Figure 2. Procedure used for conducting EFA following Field (2013).

Analysis of Variance (ANOVA). ANOVA is a statistical method used to test differences between two or more means. An ANOVA was conducted to determine whether there were significant differences between male and female participants for the four constructs. Previous studies showed significant gender differences in the acceptance of video games (Wang & Wang, 2008), weekly playing time of video games (Greenberg, Sherry, Lachlan, Lucas, & Holmstrom, 2010; Bourgonjon, 2009), motivation for gameplay (Yee, 2006; Williams et al., 2009). However, this stereotype of video game players has been challenged by recent studies. For example, after a close examination of the literature on gender and gaming, Romrell (2014) found that although women are less likely to describe themselves as gamers, those who identify as such play games play more

often and for longer periods of time than male players. Papstertio (2009) showed that both male and female participants achieved better learning outcomes and showed more positive attitudes through video games than other web applications. To date, no existing research has targeted MMORPGs players. Due to the controversies and limitations of the existing literature, it is necessary to conduct an ANOVA test to examine the association between gender and variables of interest.

A *Chi*-square test of independence was performed to investigate the association between weekly playing time and gender. Prior research (e.g. Bourgonjon et al., 2010; Greenberg et al., 2010) showed significant difference of weekly playing time between males and females. However, no research has reported the results from the perspective of MMORPG players. This test can extend the current literature on the association of gender and weekly playing time.

Research Model and Hypothesis. I conducted a path analysis by using IBM AMOS 25 to depict the correlation matrices hypothesized in the study and to test the hypothesized causal paths between variables. The method of path analysis was first developed by geneticist Sewall Wright around 1918. It is "a special type of multi-variate analysis, a method of dealing with a 'closed' system of variables that are linearly related" (Li, 1956, p. 190). In other words, all of the causal relationships among factors are demonstrated within a completed system (Li, 1956). As an extension of multiple regression, path analysis is a straightforward extension of multiple regressions, which can provide estimates of multiple and interrelated causal relationships concurrently within a single input path diagram (Hair et al., 1998). I chose the path analysis method for this

research because compared to multiple regression, it provides a more realistic view of the world (Norman, 2008). For example, there is only one dependent variable in multiple regression, and a variable in multiple regression is either a predictor or an outcome. However, path analysis can depict sources of correlations among two or more dependent variables. In other words, a variable in path analysis could be both a "cause" and an "effect." In addition, both a direct and indirect effect on a dependent variable could be produced within one diagram.

However, the purpose of employing path analysis technique is not to draw a conclusion on the causal relationships among a set of correlated variables; on the contrary, the researcher must formulate a causal pattern based on hypothesis (Li, 1956). The path model for this study was hypothesized based on the results of previous studies (Bourgonjon et al., 2010; Davis, 1989) that suggest a causal relationship among the four factors. It is worth noting that the hypotheses would be revised upon the results of data analysis.

H1: Usefulness (USE) positively affects players' preference for MMORPGs (PRF).

H2: Ease of Use (EOU) positively affects players' preference for MMORPGs (PRF).

H3: Learning Opportunities (LO) positively affects players' Preference for MMORPGs (PRE).

H4: Experience (EXP) positively affects players' Preference for MMORPGs (PRF).

H5: Ease of USE (EOU) positively affects Learning Opportunities (LO).

H6: Ease of Use (EOU) positively affects Usefulness (USE).

H7: Experience (EXP) positively affects Ease of Use (EOU).

H8: Experience (EXP) positively affects Learning Opportunities (LO).

H9: Experience (EXP) positively affects Usefulness (USE).

H10: Learning opportunities (LO) positively affects Usefulness (USE).

To begin the path analysis, the first step is to specify a structural model that depicts the causal hypotheses proposed by the researcher (Keline, 1998). The 10 research hypotheses in regard to the relations among the five constructs are depicted in the structural model of this study in Figure 3.
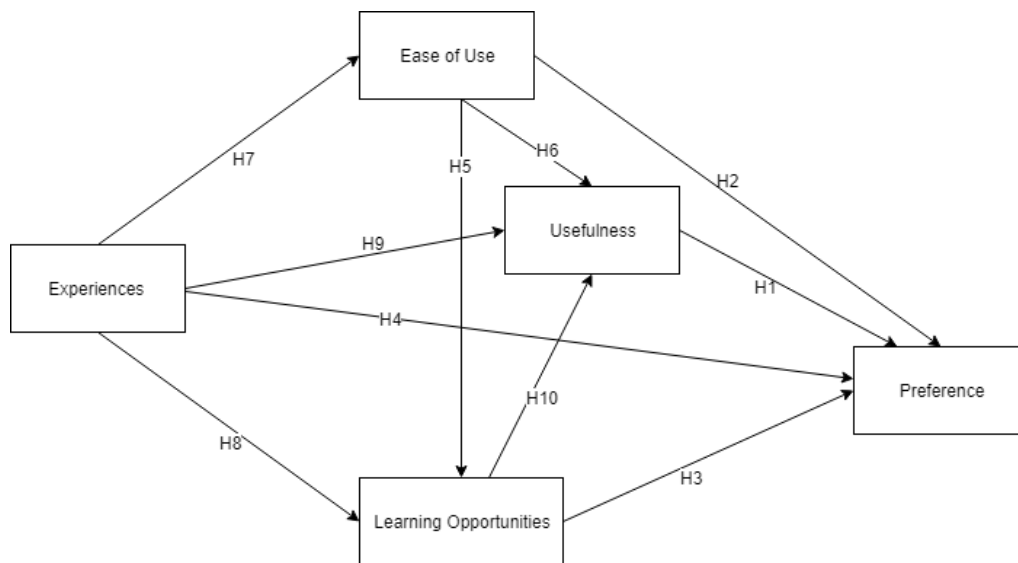
Figure 3. A depiction of the Hypothetical Structural Model.

Model Fit. "Goodness-of-fit measures the correspondence of the actual or observed input (covariance or correlation) matrix with that predicted from the proposed model" (Hair et al., 1998, p. 611). A variety of model fit indices was selected to

determine the adequacy of model fit to the data: the Comparative Fit Index (CFI), the Tucker-Lewis index (TLI), the Normed Fit Index (NFI), and the Goodness of Fit Index (GFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). CFI and the TLI were employed to determine a good model fit. Values equal to or greater than .90 are widely used as adequate indices (Bryne, 2001; Hu & Bentler, 1999). RMSEA and SRMR values are expected to be equal to or less than .06 (Hu & Bentler, 1999) to reflect a good fit. According to Cope, Harju, and Wuensch (2001), a GFI value of .90 and above is needed for the model to be considered a good fit. NFI According to Tabachnick and Fidell (2001), an NFI value of greater than .90 is indicative of a good-fitting model.

Phase Two: Qualitative Phase

Data Collection. The second, qualitative phase of the study aims to elaborate the statistical results yielded from the first, quantitative phase to answer the following research question: Why are the factors, tested in the first phase, significant predictors of players' preference for using MMORPGs to facilitate English vocabulary acquisition? This research question consists of three sub-questions:

Sub-question 1: How do MMORPGs enhance ELL players' English vocabulary growth?

Sub-question 2: How do MMORPGs provide sufficient learning opportunities for ELL players to obtain English vocabulary?

Sub-question 3: How can educators integrate MMORPGs into L2 classroom instruction?

Interview protocol development. Construction of the Interview Protocol is suggested to be derived from the research questions and contain the information that helps elicit answers to these questions (Maxwell, 2008). The interview protocol for this study was grounded in the quantitative results from the first phase to understand why certain predictor variables contribute differently to the vocabulary growth of the participants in the MMORPG context. To follow the principles that interview questions need to be "far more focused, context-specific, and diverse than the broad, general research questions" (Maxwell, 2008, p. 236), the interview protocol was built upon a combination of the statistical results yielded from the first phase of the study and a close examination of the existing literature addressing similar questions. Thus, 13 open-ended questions were composed. The interview protocol was sent to the committee chair for an initial review.

Prior to the recruitment of participants and data collection, an exempt review application was sent to the University's Institutional Review Board (IRB) office to maintain an ethically appropriate standard for this research. Upon the approval obtained from IRB office, I pilot tested the interview protocol on one participant to examine the potential weaknesses of the question design and to make revisions prior to the implementation of the study (Kvale, 2007). Turner III (2010) suggests that pilot test participants should share the same traits as the target population and have similar interests as those who will participate in the implemented study. Thus, one participant who responded to the survey was selected in the pilot test by using a convenient sampling approach. The participant for the pilot interview was a 26-year-old female doctoral

student from Clemson University. Her first language is Chinese and she has been playing MMORPGs for 4 years. Given the fact that we share the same first language and we have been friends for four years, it was expected that she could provide feedback on the interview questions with fewer misunderstandings and less discomfort than a stranger might. The pilot interview was conducted face-to-face at my apartment in July 2018, and it was audio-typed. The length of the pilot interview was 44 minutes. After the interview, I asked the participant whether the questions were clear and understandable for her as an ELL. Then, I made minor revisions on the phrasing of the questions based on her feedback. By repeatedly listening to the recording and reexamining the research questions, I made further improvements to the interview protocol by splitting big questions into several individual questions and asking them one by one. For example, instead of asking the participants "Can you tell me about your experiences when learning English vocabulary at school? What does it look like? Do you like it? Why or why not?," I split the question into "Can you tell me about your experiences of learning English vocabulary at school?," and "Tell me the reasons why you like or dislike it."

Recruitment of the Participants. The characteristics of the sequential explanatory design of the mixed-methods research dictate that participants for the second qualitative phase should be selected from those who have completed the survey. Given that the purpose of this research phase is to deepen the understanding of the quantitative results by illuminating the participants' experiences and views, the purposeful sampling approach was selected to identify and select information-rich cases for in-depth understanding (Patton, 1990, 2002). Specifically, information-rich cases are those "from

which one can learn a great deal about issues of central importance to the purpose of the inquiry" (Patton, 2002, p. 230), those who are especially knowledgeable about a phenomenon of interest (Cresswell & Clark, 2011), and those who are available and willing to participate in the research and who also have the ability to articulate and communicate (Bernard, 2002). Among the 16 types of purposeful sampling identified by Patton (1990), the criterion sampling approach was employed for recruiting participants for this study. Criterion sampling refers to the procedure of "selecting cases that meet some predetermined criterion of importance" (Patton, 2002, p. 238). Among the 371 participants who responded to the survey, 107 of them expressed their willingness to participate in the follow-up interviews. Next, a close examination of the questionnaires, especially the open-ended questions, was conducted to identify knowledgeable and experienced players who are capable of articulating their experiences. The open-ended questions included "What do you think are feasible ways to integrate MMORPGs into English course instruction? Or, why do you think it is not feasible?" and "Is there anything we haven't asked on this form that you think we should have?" Those who offered detailed and well-structured answers were identified as "information-rich" participants. Finally, I used the maximum variation sampling strategy (Creswell, 2005) to maximize the diversity of the participants in terms of age, gender, first language, educational background, and years of playing MMORPGs. By using these criteria, 40 participants were identified as interview candidates.

Email invitations, along with interview protocols and informed consent information, were sent to 5 players every week from July 24, 2018. In contrast with

quantitative research, data analysis and data collection in qualitative research can proceed concurrently (Merriam, 1998), meaning that this weekly based data collection allowed me to consistently reflect on the data and the preliminary findings, which informed the subsequent data collection procedures. At the time when I finished 11 interviews and the data reached saturation, 25 email invitations had been sent out.

Prior to the interviews, I exchanged emails with the participants to negotiate the interview schedule, notify them of the purpose of the interview, explain the terms of confidentiality, outline the format and length of the interview, and tell them that the interview would be tape-recorded and transcribed. The interviewees were also informed that they might be asked to review the transcribed interviews and confirm the contents if necessary. Each interviewee was awarded a $15 Amazon e-gift card sent by email upon the completion of each interview.

The data collection approach for this study was in-depth semi-structured interviews with 11 purposefully selected participants. The interviews ranged from 26 to 90 minutes. All interviews were recorded and transcribed verbatim. The interview format was a standard open-ended interview, in which participants are asked identical questions, but their responses are open-ended (Gall, Gall, & Borg, 2003). This pattern was selected because it allows the participants to share their views in great detail and provide adequate opportunities for researchers to probe with follow-up questions (Turner, 2010). Ten interviews were conducted online via Discord and Skype. One interview was conducted face-to-face at a quiet cafeteria in the Clemson area. Table 1 presents the date, length, and type of the interviews.

Table 1
Data, Duration and Type of the Data Collection Procedure

No.	Name	Date	Duration	Interview Type
1	Beth	July 30, 2018	00:55:02	Discord
2	Toby	Aug. 2, 2018	00:51:45	Skype
3	Cody	Aug. 3, 2018	00:51:32	Discord
4	Ellen	Aug. 6, 2018	01:29:51	Discord
5	Andy	Aug. 7, 2018	00:40:50	Discord
6	John	Aug. 19, 2018	00:33:00	Discord
7	Victor	Sep. 2, 2018	00:27:36	Discord
8	Andrew	Sep. 15, 2018	00:49:18	Discord
9	Izzie	Sep. 18, 2018	00:40:56	Discord
10	Pablo	Sep. 18, 2018	00:26:38	Discord
11	Yasmin	Oct. 5, 2018	00:31:57	Face-to-face

To facilitate easy retrieval, all items obtained from each data source were categorized, indexed, and cross-referenced (Sasa, 2014).

*Data Analysis***.** The goal of the follow-up, qualitative study was to elaborate on the quantitative results in more depth and obtain a more detailed understanding of how players engaged in learning English vocabulary by playing MMORPGs and how they applied their acquired knowledge. It specifically aimed to investigate why and how certain factors tested in the first phase were significant or not significant predictors of players' preference for using MMORPGs to learn English vocabulary.

The Qualitative Methodology**.** Directed content analysis was used to analyze the qualitative data. Qualitative Content Analysis (QCA) is a research method for

understanding and interpreting textual content interviews or observations by identifying

themes and patterns using a systematic process of coding (Assarroudi, Heshmati Nabavi,

Armat, Ebadi, Vaismoradi, 2018; Hsieh & Shannon, 2005). QCA is regarded as a flexible

method for analyzing qualitative textural data, and it has been widely used in recent years

(Cavanagh, 1997; Hsieh & Shannon, 2005). There are three different approaches to QCA

that a researcher can choose depending on their research questions and theoretical

interests: conventional (inductive), directed (deductive), and summative methods (Hsieh

& Shannon, 2005; Mayring, 2014).

A directed content analysis approach was chosen for the current study because it

enables researchers to identify initial coding categories by using existing theory or prior

research (Potter & Levine-Donnerstein, 1999). The current qualitative study is built upon

a prior quantitative strand with the purpose of elaborating variables and relationships

among the variables inducted from the first phrase. That is to say, data analysis of the

second strand is deductive by nature. By using directed content analysis, the focus is on

the research questions, allowing researchers to formulate initial coding categories or

themes by using the existing or prior theory and making predictions on the variables and

relations among variables (Mayring, 2000). The findings derived from the directed

content analysis were employed as evidence to support or disapprove the conclusions

drawn from the prior stage.

The strategies proposed by Hsieh and Shannon (2005) were employed to guide

the direct QCA. Hsieh and Shannon suggested two strategies. The first is to read the

transcripts and highlight the texts that seem related to the predetermined categories. Then,

code the highlighted texts. In contrast, the second strategy is to start the coding process immediately without highlighting the transcripts (Assarroudi et al., 2018). Both strategies require an iterative coding process. I decided to code the transcripts immediately because that approach can strengthen the trustworthiness of the study by allowing me to capture all relevant circumstances and recognize newly emerged codes (Assarroudi et al., 2018). Hsieh and Shannon (2005) suggested that textual data that cannot be categorized with the initial coding scheme should be given a new code. To that end, the interview protocol was formulated to ask open-ended questions first, followed by questions targeting the predetermined categories (Assarroudi et al., 2018; Hsieh & Shannon, 2005). For example, the open-question "Can you tell me your experiences of learning English by playing MMORPGs?" would be followed by the targeted question "What are your major sources of learning English by playing MMORPGs?" to address the category of "learning opportunities."

By following Hsieh and Shannon's (2005) suggestions, I began the data analysis process by identifying the initial categories obtained in the prior quantitative research. The first, quantitative study concluded that the learning opportunities perceived by MMORPG players have a direct, positive influence on their preference for using MMORPGs to acquire English vocabulary. While perceived usefulness and ease of use do not directly impact their preference, perceived ease of use has a positive influence on both perceived usefulness and learning opportunities. In addition, perceived learning opportunities directly influence players' perception of the game's usefulness. In other words, if players believe that MMORPGs can provide the resources needed to learn

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English, they would tend to believe that MMORPGs are useful for learning purposes and would therefore accept this learning approach. Also, if players believe that MMORPGs are an easy-to-use tool for learning English, they would tend to believe that MMORPGs are resourceful and useful. The purpose of the current study is to further explore these factors and relations among the identified categories. Thus, learning opportunities, usefulness, ease of use, and preference are the main categories derived from the initial research. The formed factor "playing experiences" was removed from the instrument after the first quantitative data analysis stage due to low internal consistency. However, I decided to include "playing experiences" into the predetermined categories in order to further investigate why playing experiences do not correlate with players' preference in this study. Next, an accurate theoretical definitions for the each category were determined based on the existing literature and prior research:

Perceived Usefulness refers to "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989, p. 320).

Perceived Ease of use refers to "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989, p. 320).

Perceived Learning opportunities refers to "the degree to which a person believes that using [MMORPGs] (originally 'video games') in the classroom can offer him or her opportunities for learning" ('vocabulary' was added to the original definition) (Bourgonjon et al., 2010, p. 1147).

Playing Experience refers to the time dedicated to playing MMORPGs.

Preference for MMORPGs refers to "positive feeling about [MMORPGs] (originally 'games') for learning and predicted choice for [MMORPGs] (originally 'video games') in the classroom" (Bourgonjon et al., p. 1147).

The Main Coding Process. After determining the main categories and their operational definitions, I started the process of coding the interview transcripts. Coding is a "critical link" between data collection and data interpretation (Charmaz, 2001), which is an iterative process of assigning codes to raw data. By definition, code refers to "a word or short phrase that symbolically assigns a summative, salient, essence-capture, and/or evocative attribute for a portion of language-based or visual data" (Saldana, 2009, p. 3). In other words, code is a construct created by the researcher for the purpose of explaining the meaning of data (Vogt et al., 2014). In most cases, codes are developed either from existing theory or from the raw data (Ryan & Bernard, 2003). For this study, interview transcripts comprise the major data sources. A combination of pre-determined and emergent coding approaches were adopted to create both theory- and data-driven codes.

Coding in qualitative studies can be conducted collaboratively or individually (Saldana, 2014). Some researchers (Erickson & Stull, 1998; Patton, 1999; Schreier, 2012) advocate for collaborative coding to avoid personal biases and to broaden the scope of the analysis. In contrast, some experts (Janesick, 2003; Morse, 1994) proposed that the data collection and analysis work should be conducted by a single researcher because the two are so closely intertwined. Coding for this study was conducted individually. Recruiting a team of experts with different backgrounds and providing cross-training are challenging, considering the timeline of the research. Additionally, coding by one single researcher is

preferred when the continuing relationships with participants are important for the data quality (Bradley & Devers, 2007). My relationship with the participants started from the preparation stage of the research, and it was ongoing throughout the data collection process. Therefore, coding the interview data individually instead of collaboratively is appropriate.

Data analysis in the second, qualitative phase began by transcribing each interview verbatim (Creswell 2005), checking for accuracy, and entering them into the data analysis tool ATLAS.ti 8. Software was used to assist me with quickly retrieving and managing the coded data, and to generate theoretical assumptions through observations of the visual display of the code relationships. However, it was my responsibility to create the codes and decide what to enter into the computer (Glesne, 2014). The coding process was guided by *The Coding Manual for Qualitative Researchers* by Saldana (2014).

The Coding Cycles*.* Two cycles of coding were involved in the interview data analysis process. The initial coding cycle included a close review of the data along with recording thoughts and reflections and the development of a preliminary codebook. Among the 26 first cycle coding methods provided by Saldana (2014), Initial Coding was appropriate to make initial analytic decisions on the raw data. By using Initial Coding (also referred to as "open coding"), researchers construct codes by reading quickly but carefully through the data, breaking down the data into detached pieces, making a close examination of them and exploring their similarities and differences (Charmaz, 2014; Strauss & Corbin, 1998). In addition to naming the codes by myself, the In Vivo Coding method was employed as a complementary approach during Initial Coding. Different

from other coding approaches, codes generated by using In Vivo Coding are actual words, terms, or phrases used by the participants (Saldana, 2014). Given the fact that the raw data contained terms that were unique to the culture of MMORPGs, the In Vivo Coding approach was particularly useful to deepen my understanding of participants' opinions through coding that used their actual words (Saldana, 2014).

Data analysis started with repeatedly reading and re-reading the interview transcripts to absorb the information and obtain a preliminary understanding of the whole (Tesch, 1990). Then, a word-to-word, line-to-line coding was adopted to derive initial codes (Miles & Huberman, 1994; Morgan, 1993; Morse & Field, 1995). Following the suggestions of Thornberg and Charmaz (2013), the whole coding process was guided by analytical questions commonly asked by grounded theorists (Charmaz, 2014; Glaser, 1978, 1998) to critically and analytically code the data:

1. What is this data a study of?

2. What category does this incident indicate?

3. What is actually happening in the data?

4. What is the participant's main concern?

5. What do the actions and statements taken for granted?

6. What process(es) are at issue here? How can I define it?

7. How does this process develop?

8. How does the research participant(s) act and profess to think and feel while involved in this process?

9. What might his or her behavior indicate?

10. When, why and how does this process change and what are the

consequences?

Based on the suggestions that coding involves "the process of grouping evidence and labeling ideas so that they reflect increasingly broader perspectives" (Creswell & Clark, 2010, p. 208), the second round of coding worked with codes to "look for patterns, make comparisons, produce explanations and build models" (Gibbs, 2007, p. 78). In other words, the second cycle of code work is a more analytic process, aiming to develop themes and theoretical organization (Saldana, 2014). For this specific study, three goals were expected during the second cycle of coding. The first was to group the codes into the predetermined main categories: *learning opportunities*, *usefulness*, *ease of use*, *playing experiences*, and *preference*. The second was to closely examine the data for each category and decide whether subcategories are needed. The third was to develop salient categories or themes using the Axial Coding method (Saldana, 2014) for the data that cannot be grouped into the five categories. The development of the newly emerged categories was guided by grounded theory (Glaser & Strauss, 1967), a methodological approach for generating theories that emerge through specific data collection and analysis processes. Different from logical empiricism, grounded theory supports qualitative research through a set of specific procedures that include data sampling, coding, categorizing, and comprising (Glesne, 2014). Grounded theory is considered appropriate for the current study because it can generate "why" questions and help discover the answers from the data (Charmaz, 2017). By using grounded theory, the researchers generate ideas about the data through coding and comparative analysis, and these ideas

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would compel the researcher to conduct a further investigation until an original theory is created (Charmaz, 2017). Strauss and Corbin (1998) suggest that a minimum of 10 interviews or observations are required for generating a grounded theory. Thus, the interview data for the current study was considered sufficient to construct concepts. To that end, constant comparative analysis (Glaser & Strauss, 1967) was employed to obtain theories grounded in the data by identifying patterns from the collected data.

Finally, categories of the codes were determined through the repeated process of revisiting the initial codes and reexamining the relationships among them, which led to the assignment of category clusters.

Theme Development. The final stage of the data analysis was to confirm themes that developed the storyline. Different from categories, which are an explicit description of the participants' accounts, themes are an abstract and implicit concept that requires interpretation (Sandelowski & Barroso, 2003). A thematic analysis method was utilized to identify, analyze, and report patterns derived from the data. Given that a good thematic analysis should be transparent and explicit, I followed the step-by-step guide proposed by Braun and Clarke (2006) to identify themes within the data that captured the players' experiences and perceptions of learning English vocabulary by playing MMORPGs. Specifically, I started by searching for themes that present the main idea that developed from the categories. By following Braun and Clarke's (2016) example, a thematic map was used at this early stage to help me sort different categories into themes. Next, I closely examined the candidate themes and made refinements, making sure that each theme description fits into the whole data in relation to the research question (Cho &

Trent, 2006). Two specific steps were involved in this stage: First, I revisited all the extracted data for each theme to determine whether a consistent pattern existed. Then, I examined the association between the themes and the whole data set to determine whether the themes accurately represented the data. The thematic map was revised accordingly at this stage. The third step was to define and formulate the theme statements by addressing the specifics of each theme. Sentences, instead of words, were employed to capture complete ideas (Sandelowski & Leeman, 2012).

Finally, the meaning of the analysis results were interpreted to address the research questions and relevant studies and presented as a narrative (Creswell & Clark, 2010). In other words, by connecting the theme statements to the theoretical concepts (Vaismoradi, et al., 2016), I developed the study's storylines to help the readers understand its contributions.

Upon completing the data analysis process, I used the 15-point checklist of criteria for a good thematic analysis process (Braun & Clarke, 2006) to review my data analysis procedure and made refinements accordingly. The criteria for a Written Report were used after I completed the subsequent chapter of results and findings.

Table 2
A 15-point checklist of criteria for good thematic analysis (Braun & Clarke, 2006, p.96)

Process	No.	Criteria
Transcription	1	The data have been transcribed to an appropriate level of detail, and the transcripts have been checked against the tapes for 'accuracy'
Coding	2	Each data item has been given equal attention in the coding process.

	3	Themes have not been generated from a few vivid examples (an anecdotal approach), but instead the coding process has been thorough, inclusive and comprehensive.
	4	All relevant extracts for all each theme have been collated.
	5	Themes have been checked against each other and back to the original data set.
	6	Themes are internally coherent, consistent, and distinctive.
Analysis	7	Data have been analyzed / interpreted, made sense of / rather than just paraphrased or described.
	8	Analysis and data match each other / the extracts illustrate the analytic claims.
	9	Analysis tells a convincing and well-organized story about the data and topic.
	10	A good balance between analytic narrative and illustrative extracts is provided.
Overall	11	Enough time has been allocated to complete all phases of the analysis adequately, without rushing a phase or giving it a once-over-lightly.
Written report	12	The assumptions about, and specific approach to, thematic analysis are clearly explicated.
	13	There is a good fit between what you claim you do, and what you show you have done / ie, described method and reported analysis are consistent.
	14	The language and concepts used in the report are consistent with the epistemological position of the analysis.
	15	The researcher is positioned as active in the research process; themes do not just 'emerge'.

Trustworthiness. Unlike quantitative research, which establishes credibility

through validity and reliability tests, qualitative studies establish coherence and

trustworthiness (Lincoln & Cuba, 1985) through a process of verification (Ivankova, 2002). To validate the data and findings, member-checking with the interview participants and external review were used in the qualitative stage of the study. Specifically, participants were asked to check whether the results accurately reflected their experiences. Because the interviews were conducted in a second language, meaning participants might have used inaccurate expressions that are confusing to understand, I emailed the transcripts to some participants, highlighting the confusing parts, and asked them to clarify the meaning. The second member checking took place when I finished the theme development, when I asked the participants to check its accuracy. Additionally, the dissertation committee members were asked to review the process and results throughout the study (Creswell & Clark, 2010; Stake, 1995). Finally, a rich and thick description of the findings were provided to help determine whether the information matches reality (Ivankova, 2002; Merriam, 1988).

CHAPTER FOUR

RESULTS

This chapter presents the findings of each phase of the study. The first section describes the major findings from the quantitative phase, utilizing both SPSS 25 for Windows and AMOS version 25. Results from descriptive statistics, ANOVA, Exploratory Factor analyses, reliability analysis, and path analysis are reported. EFA results are presented following the guidelines established by Cabrera-Nguyen (2010) to scale development and validation. The second section describes the findings that evolved from data collected through interviewing a total sample of 11 participants who responded to the survey.

Phase One: Quantitative Study

This chapter reports qualitative findings from the data analysis of the present study, utilizing both SPSS 25 for Windows and AMOS version 25. Results from descriptive statistics, ANOVA, Exploratory Factor analyses, reliability analysis, and path analysis are reported. EFA results are presented following the guidelines established by Cabrera-Nguyen (2010) to scale development and validation.

Data Screening. The data was screened for entry errors and missing data. Seven cases were removed from the data set because the participants' first language is English. Maximum Likelihood (ML) Estimation by using AMOS 25 was performed to deal with the missing data. A sample size larger than 300 is usually considered acceptable for running EFA (Worthington & Whittaker, 2006). The respondent-to-item should be at

least 10: 1 (Kline, 1998). Thus, the minimum amount of data for factor analysis was satisfied, with a final sample of 371, providing a ratio of over 19 cases per variable.

Demographic Information of the Participants. Of the total 371 valid respondents, there were 330 males (89%) and 41 females (11%). This remarkable disproportion probably results from the fact that there are more male than female gamers (Yee, 2016) and that men are more likely to use Reddit than women (Duggan & Smith, 2013). Thirty-six different first languages were reported. Among them, German, Spanish, French, and Dutch are the most frequently reported first languages, accounting for 14.3%, 12.4%, 9.9%, and 8.5%, respectively. The highest completed educational level reported for approximately one-third of the participants (30%) was "High school graduate, diploma or the equivalent (for example: GED)," 23% were "Bachelor's degree," and 21% were "some college credit, no degree." Ages of the participants ranged from 16 to 42. Approximately two-third of the participants (67%) reported being between 21-30 years old. Table 1.1 reports the frequencies and percentages of participants' ages. For the weekly playing time, 85 participants (22.9%) reported that they play MMORPGs more than 20 hours a week. Table 1.2 reports the frequencies and percentages of participants' weekly playing time. The question item EXP 1, "On average, how many hours do you play MMORPGs weekly" was reverse scored by labeling "more than 20 hours" as "1" and "1-3 hours per week" as "6."

Table 3.1
Frequencies and Percentages of Age Differences of the Participants

Age Range	Frequency	Percentage
16-20	88	23.7
21-25	161	43.4
26-30	86	23.2
34-35	24	6.5
36-40	10	2.7
above 40	2	.5

Table 3. 2
Frequencies and Percentages of Participants' Weekly Playing Time

Playing Time Range	Frequency	Percentage
More than 20 hours	85	22.9
16-20 hours	80	21.6
12-15 hours	62	15.7
8-11 hours	81	21.8
4-7 hours	40	10.8
3 hours or less	23	6.2

Exploratory Factor Analysis. Factor analysis was conducted on the 19 question items, and the factorability of the 19 question items was examined. The item means, standard deviation, and standard errors are presented in Table 2.1. On a 6-point scale, where 1 = strongly agree to 6 = strongly disagree, the means ranged from 1.34 (Q2: I like playing MMORPGs) to 3.25 (Q5: I play different MMORPGs). Table 2.2 shows the interitem correlation among the 19 question items and selected covariates (age and

education level). It was observed that 16 of the 19 items correlated ≥ |.30| with at least one other item in the matrix (range: 1-10). No interitem correlation exceeded r = .754, thus indicating no problems with multicollinearity. After a close examination, three items that had very low correlation with any other variable were dropped from the scale. Additionally, another three questions items—"Q2: I like playing MMORPGs," "Q4: Compared to people of my age, I play a lot of MMORPGs," and "Q5: I would describe myself as a gamer of MMORPGs"—might cluster in factor analysis, because they had significant correlation with each other. However, these questions seem problematic because Q2 and Q5 correlated with only Q4 in the matrix. Further analysis would be performed before I decided whether to abandon these items or not. The selected covariates "age" and "education level" have no significant correlation with any of the question items, which indicate that they are not confounding variables and would not be included in the future research model.

Secondly, a maximum likelihood analysis was conducted on the 16 items with oblique rotation. Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy were used to evaluate the strength of the linear association among the 16 selected items. The KMO measure was .845, which was "meritorious" according to the criteria by Hutcheson and Sofroniou (1999). The Bartlett's test of sphericity was significant ($\chi2 = 2188.200$, p = .000), which indicates that the correlation matrix was not an identity matrix.

The item-to-total scale correlations ranged from .166 ("Compared to people of my age, I play a lot of MMORPGs") to .627 ("I can acquire English vocabulary in an

efficient way by playing MMORPGs"). Cronbach's alpha for the total 16 items was .850

(n = 16).

An initial analysis was run to obtain eigenvalues for each factor in the data. Five

factors had eigenvalues over Kaiser's criterion of 1 and in combination explained 66% of

the variance, with 32%, 12%, 9%, 7%, and 6% of the variance respectively (see Table 3).

The scree plot showed inflexions that justify retaining 4 or 5 factors. I retained 5 factors

because of the large sample size and the convergence of the scree plot and Kaiser's

criterion on this value. Table 4 shows the factor loadings after rotation. The items that

cluster on the same factor suggest that factor 1 represents *Usefulness (USE)*, factor 2

represents *Preference (PRE)*, factor 3 *Ease of Use (EOU)*, factor 4 *Playing Experiences*

(PRF), and factor 5 *Learning Opportunities (LO)*.

Table 4.1

Mean, Standard Deviation, and Standard Errors of the 19-item Questionnaire

Question items	Mean	S.D.	S.E.
Q1. On average, how many hours do you play MMORPGs weekly?	2.95	1.53	.079
Q2. I like play MMORPGs.	1.34	.550	.029
Q3. Compared to people of my age, I play a lot of MMORPGs	1.97	.944	.049
Q4. I would describe myself as a MMORPGs gamer.	2.15	1.10	.057
Q5. I play different MMORPGs.	3.25	1.64	.058
Q6. I have acquired English vocabulary by playing MMORPGs.	1.68	.96	.05
Q7. I can acquire English vocabulary in an efficient way by playing MMORPGs.	1.92	.95	.049
Q8. I know how to use the vocabulary I acquired from MMORPGs.	1.58	.75	.039
Q9. I know how to use MMORPGs to acquire English vocabulary	2.03	.97	.05
Q10. It would be easy for me to use MMORPGs to acquire English vocabulary.	2.02	.95	.05
Q11. My interaction with both non-player characters and other players is easy and understandable.	1.38	.54	.029
Q12. MMORPGs offer opportunities for me to experiment with English vocabulary.	1.68	.87	.045
Q13. MMORPGs offer opportunities for me to take control over the learning process.	2.43	1.19	.062
Q14. MMORPGs offer opportunities for me to interact with other players and acquire English vocabulary.	1.37	.64	.033
Q15. MMORPGs motivate me to acquire English vocabulary.	1.78	1.02	.053
Q16. MMORPGs offer opportunities for me transfer the vocabulary knowledge between the game and the real world.	1.77	.88	.046
Q17. If I had the choice, I would choose to follow courses in which MMORPGs are used.	2.33	1.32	.069
Q18. I am enthusiastic about using MMORPGs in the English classrooms.	2.45	1.40	.073
Q19. Compared to traditional classroom instructions, I prefer to integrate MMORPGs into the vocabulary instruction.	2.61	1.34	.069

Table 4.2
Intercorrelations among Variables in the 19-item Questionnaire, and Select Covariates (N = 371)

	Age	Edu	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19
Age	-	.339	.015	.106	-.101	-.081	.014	.168	.103	.121	.230	.165	.094	.047	.169	.019	.041	.093	.050	.086	.055
Edu		-	.142	.027	.060	-.007	-.018	.009	.039	.048	.077	.020	.078	.065	.027	.025	.018	.119	-.020	-.003	-.017
Q1			-	.229	.298	.203	.003	.019	.075	-.001	.062	.043	.105	.009	.013	.026	.029	.027	.006	-.018	.036
Q2				-	.237	.487	.153	.147	.235	.100	.212	.196	.270	.131	.130	.177	.122	.049	.267	.238	.250
Q3					-	.358	.194	.090	.112	.115	.048	.041	.131	.043	.049	.083	.063	.118	.052	.044	.094
Q4						-	.231	.248	.263	.127	.177	.185	.106	.179	.135	.130	.135	.043	.269	.268	.246
Q5							-	.165	.177	.191	.151	.086	.078	.103	.112	.126	.099	.075	.148	.139	.131
Q6								-	.433	.436	.316	.327	.100	.261	.141	.232	.323	.284	.154	.145	.125
Q7									-	.545	.505	.521	.189	.390	.400	.363	.366	.384	.278	.261	.325
Q8										-	.377	.322	.247	.276	.316	.446	.314	.428	.237	.173	.252
Q9											-	.706	.244	.372	.373	.251	.288	.335	.219	.247	.205
Q10												-	.248	.342	.302	.247	.277	.321	.222	.213	.216
Q11													-	.191	.205	.242	.086	.246	.132	.134	.106
Q12														-	.429	.287	.253	.345	.300	.314	.258
Q13															-	.260	.301	.372	.293	.337	.346
Q14																-	.340	.414	.180	.172	.181
Q15																	-	.440	.272	.278	.324
Q16																		-	.230	.223	.250
Q17																			-	.741	.684
Q18																				-	.754
Q19																					-

Table 5
Total Variance Explained by the Five Extracted Factors

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% Variance	Cumulative %	Total	% Variance	Cumulative %
1	5.194	32.463	32.463	2.599	16.242	16.242
2	1.895	11.847	44.309	3.049	19.059	35.301
3	1.497	9.358	53.667	1.347	8.417	43.718
4	1.123	7.022	60.689	1.005	6.282	49.999
5	.898	5.614	66.302	.592	3.699	53.689

Table 6
Rotated Factor Matrix for the 16-item Questionnaire

Question Items	Factors				
	1	2	3	4	5
I have acquired English vocabulary by playing MMORPGs.	.437				
I can acquire English vocabulary in an efficient way by playing MMORPGs.	.528				
I know how to use the vocabulary I acquired from MMORPGs.	.994				
I know how to use MMORPGs to acquire English vocabulary.			.838		
It would be easy for me to use MMORPGs to acquire English vocabulary.			.837		
If I had the choice, I would choose to follow courses in which MMORPGs are used.		.817			
I am enthusiastic about using MMORPGs in the English classrooms.		.907			
Compared to traditional classroom instructions, I prefer to integrate MMORPGs into the vocabulary instructions.		.832			
I like playing MMORPGs.				.557	
Compared to people of my age, I play a lot of MMORPGs.				.427	
I would describe myself as a gamer of MMORPGs.				.853	
MMORPGs offer opportunities for me to experiment with English vocabulary.					.501
MMORPGs offer opportunities for me to take control over the learning process.					.524
MMORPGs offer opportunities for me to interact with other players and acquire English vocabulary.					.555
MMORPGs motivate me to acquire English vocabulary.					.599
MMORPGs offer opportunities for me to transfer the vocabulary knowledge between the game and the real world.					.728

Note. The exaction method used was Maximum Likelihood. The rotation method used was Oblimin with Kaiser Normalization.

Finally, internal consistency for each scale was examined using Cronbach's alpha. By following the suggestions of Hatcher (1994), simple descriptive statistics (including means and standard deviations) and correlations were also performed. Table 5 presents the descriptive statistics, between-factor correlations, and alpha coefficients for the five

generated subscales. The reliability estimates were moderate: .888 for Preference (3 items), .827 for Ease of Use (2 items), .710 for Learning Opportunities (5 items), and .718 for Usefulness (3 items). However, the Playing Experiences (3 items) subscale had relatively low reliability, with Cronbach's α = .594. The decision was made to drop playing experiences (EXP) as a construct for future data analysis. Thus, H4, H7, H8 and H9 are not supported.

Table 7
Factor Correlations and Factor Alpha Coefficients for the 16-item Scale (N = 371)

Factor	Mean	SD	1	2	3	4	5
USE *(n = 3)*	1.73	.71	(.718)				
PRF *(n = 3)*	2.46	1.22		(.888)			
EOU *(n = 2)*	2.03	.969			(.827)		
EXP *(n = 3)*	1.82					(.594)	
LP *(n = 5)*	1.81	.64					(.710)
Total scale *(n = 16)*							

Note. Reliability estimates appear in the parentheses on the diagonal.

After removing one construct, I re-performed the EFA on the selected 13 items to check whether different results of factor loadings would show up. The item means, standard deviations, and interitem correlations are presented in Table 8. Examination of the correlation matrix indicated that all items correlated at least .30 with at least four other items in the matrix (range: 4-10). No interitem correlation exceeded r = .754, thus indicating no problems with multicollinearity.

Table 8
Intercorrelations among Variables in the 13-item Questionnaire (N = 371)

	1	2	3	4	5	6	7	8	9	10	11	12	13
1	-	.433	.436	.316	.327	.261	.141	.232	.323	.284	.154	.145	.125
2	-	-	.545	.505	.521	.390	.400	.363	.366	.384	.278	.261	.325
3	-			.377	.322	.276	.316	.446	.314	.428	.237	.173	.252
4	-				.706	.372	.373	.251	.288	.335	.219	.247	.205
5						.342	.302	.247	.277	.321	.222	.213	.216
6							.429	.287	.253	.345	.300	.314	.258
7								.260	.301	.372	.293	.337	.346
8									.340	.414	.180	.172	.181
9										.440	.272	.278	.324
10											.230	.223	.250
11												.741	.684
12													.754
13													-

Four factors had eigenvalues over Kaiser's criterion of 1 and in combination explained 67% of the variance, with 38%, 14%, 8%, and 7% of the variance respectively (see Table 9).

Table 9
Total Variance Explained by the Four Extracted Factors

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% Variance	Cumulative %	Total	% Variance	Cumulative %
1	4.934	37.955	37.955	4.309	33.146	33.146
2	1.831	14.082	52.037	1.663	12.792	45.938
3	1.091	8.389	60.426	.708	5.449	51.387
4	.913	7.025	67.451	3.49	2.687	54.074

Table 10 shows the factor loadings after rotation. The items that cluster on the same factor suggest that factor 1 represents *Preference (PRF),* factor 2 represents *Ease of Use (EOU)*, factor 3 *Learning Opportunities (LO)*, and factor 4 *Usefulness (USE)*.

Table 10
Rotated Factor Matrix for the 13-Item Questionnaire

Question Items	Factors			
	1	2	3	4
If I had the choice, I would choose to follow courses in which MMORPGs are used.	.885			
I am enthusiastic about using MMORPGs in the English classrooms.	.803			
Compared to traditional classroom instructions, I prefer to integrate MMORPGs into the vocabulary instructions.	.790			
I know how to use MMORPGs to acquire English vocabulary.		.794		
It would be easy for me to use MMORPGs to acquire English vocabulary.		.762		
MMORPGs offer opportunities for me to experiment with English vocabulary.			.634	
MMORPGs offer opportunities for me to take control over the learning process.			.475	
MMORPGs offer opportunities for me to interact with other players and acquire English vocabulary.			.457	
MMORPGs motivate me to acquire English vocabulary.			.454	
MMORPGs offer opportunities for me to transfer the vocabulary knowledge between the game and the real world.			.415	
I have acquired English vocabulary by playing MMORPGs.				.748
I can acquire English vocabulary in an efficient way by playing MMORPGs.				.500
I know how to use the vocabulary I acquired from MMORPGs.				.451

Internal consistency for each scale was examined using Cronbach's alpha. Table 11 presents the descriptive statistics, between-factor correlations, and alpha coefficients for the four generated subscales. The correlations between the subscales ranged from .248 to .578. The reliability estimates presented in parentheses ranged from .710 to .888 with a total scale coefficient alpha equal to .850.

Table 11
Factor Correlations and Factor Alpha Coefficients for the 13-item Scale (N = 371)

Factor	Mean	SD	1	2	3	4
PRE *(n = 3)*	2.46	1.22	(.888)			
EOU *(n = 2)*	2.03	.969	.248	(.827)		
LP *(n = 5)*	1.81	.64	.436	.475	(.710)	
USE *(n = 3)*	1.73	.71	.296	.498	.578	(.718)
Total scale *(n = 13)*						

Note. Reliability estimates appear in the parentheses on the diagonal.

As the results in Table 11 indicate, the means for composite scores of Preference, Ease of Use, Learning Opportunities, and Usefulness are 2.46, 2.03, 1.81, and 1.73 respectively. The skewness and kurtosis statistics demonstrated a non-normal distribution for LO (sk = 1.49, ku = 5.22) and USE (sk = 1.50, ku = 4.86). The distribution of the LO and USE are skewed right, which means the right tail of the distribution is longer than the left tail. The kurtosis statistics showed peaked distributions of the responses to the variables. Due to the fact that the distribution is heavily influenced by extreme values (Sainani, 2012), a Box plot diagram was used to define the outliers. After removing the extreme values, the distribution of each variable became normal: LO (sk = .512, ku = -.263) and USE (sk = .513, ku = -.690). This suggested that the original distribution was strongly influenced by extreme scores. The previous data screen excluded the possibility of entry error. Another close examination of the outlier scores indicated that the outliers are extreme scores in response to the question items. I decided to keep the outliers, because they entail valuable information about the respondents' perceptions. Also, non-normal distributions would violate assumptions of some statistical tests, such as ANOVA and regression tests, only when the sample size is small (Field, 2013).

Overall, these analyses indicated that four factors emerged from the results of the factor analysis: 3 items for Usefulness (USE), 2 items for Ease of Use (EOU), 5 items for Learning Opportunities (LO), and 3 items for Preference (PRE). All scales adopted a six-point Likert-type scale with values ranging from 1 (strongly disagree) to 6 (strongly disagree). Estimates of reliability using Cronbach's alpha were acceptable for all factors. Six of the nineteen items were removed. An approximately normal distribution was

evident for the composite score data in the current study, thus the data were well suited for parametric statistical analyses.

ANOVA. A one-way analysis of variance was conducted to evaluate the relationship between gender and the four constructs of interests. The independent variable, gender, included two levels: males and females. The dependent variables are Preference, Learning Opportunities, Usefulness and Ease of Use. As the results in Table 12 indicate, none of the F values was significant at the .05 level, meaning there is no significant difference between males and females for any of the four constructs. This result indicates that males and females do not differ much on their perceptions toward ease of use, learning opportunities, and usefulness of MMORPGs at a group level. Both males and females show a preference for using MMORPGs to learn English vocabulary.

Table 12
ANOVA between Groups of Males and Females

	Sum of Squares	df	Mean Square	F	Sig.
USE	.039	1	.039	.077	.781
EOU	.074	1	.074	.079	.779
LO	.059	1	.059	.145	.704
PRE	.649	1	.649	.433	.511

A *Chi*-square test of independence examining the association between weekly playing time and gender shows no significant relationship was found ($\chi 2$ (5, N = 371) = 4.781, p > .05), meaning that there is no significant difference of weekly playing time by gender between MMORPG players.

Research Model and Hypothesis. A revised structural model was specified upon the removal of the unsupported hypothesis. Six hypotheses were proposed based on the results of EFA:

H1: Usefulness (USE) positively affects players' preference for MMORPGs (PRF).

H2: Ease of Use (EOU) positively affects players' preference for MMORPGs (PRF).

H3: Learning Opportunities (LO) positively affects players' Preference for MMORPGs (PRF).

H4: Ease of USE (EOU) positively affects Learning Opportunities (LO).

H5: Ease of Use (EOU) positively affects Usefulness (USE).

H6: Learning opportunities (LO) positively affects Usefulness (USE).

Figure 4 is the modified structural model depicting correlations among the four factors.
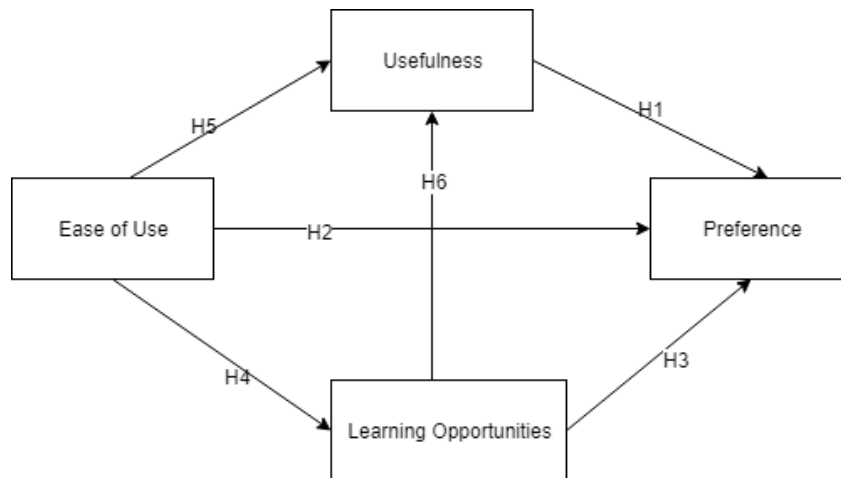

Figure 4. The Modified Hypothetical Model.

The path coefficients matrix shown in table 13 indicates that Learning

Opportunities appear to be a significant predictor for players' preference for using

MMORPGs to learn English vocabulary (H3, β = .625, p < .001). Learning Opportunities

also has a strong positive influence on Usefulness (H6, β = .615, P < .001). Additionally,

Ease of Use positively predicts Learning Opportunities (H4, β = .631) and Usefulness

(H5, β = .316) at .001 level. Ease of Use and Usefulness showed no direct influence on

Preference for MMORPGs. In fact, Ease of Use is mediated by Learning Opportunities.

In addition, 85.3% of the variance in players' preference for MMORPGs could be

explained.

Table 13
Path Coefficients of the Hypothesized Model (N = 371)

Hypothesis	Standard Regression Weights	S.E.
H1: USE→PRF	-.137	.353
H2: EOU→PRF	.010	.130
H3: LO→PRF	.625***	3307
H4: EOU→LO	.631***	.054
H5: EOU→USE	.316***	.050
H6: LO→USE	.615***	.086

*** P < .001

Model Fit. The Comparative Fit Index (CFI), the Tucker-Lewis index (TLI), the

Normed Fit Index (NFI), the Goodness of Fit Index (GFI), the root means square error of

approximation (RMSEA), and the standardized root mean square residual (SRMR) were

calculated to estimate the goodness of fit for the Modified Model. The indices are shown

in Table 14.

Table 14
Goodness-of-fit Indices (N = 371)

	CFI	TLI	NFI	GFI	RMSEA	SRMR
Model	.961	.948	.932	.946	.058	.043

The model has a CFI value of .961 and a TLI value of .948, both of which are higher than the widely accepted criteria of .90 (Bryne, 2001; Hu & Bentler, 1999), reflecting a good-fitting model. Both RMSEA and SRMR values are less than .06, suggesting a good model fit (Hu & Bentler, 1999). The GFI value and NFI value are above .90, which is needed for the model to be considered a good fit (Cope, Harju & Wuensch, 2001; Tabachnick & Fidell, 2001). All six indices indicate that the model fits well.

The final structural model (see Figure 5) shows the results of path analysis. It represents the path coefficients between the variables. The solid arrow lines represent significant relationships between the variables. The dotted arrow lines represent that the variables do not have a significant relationship.
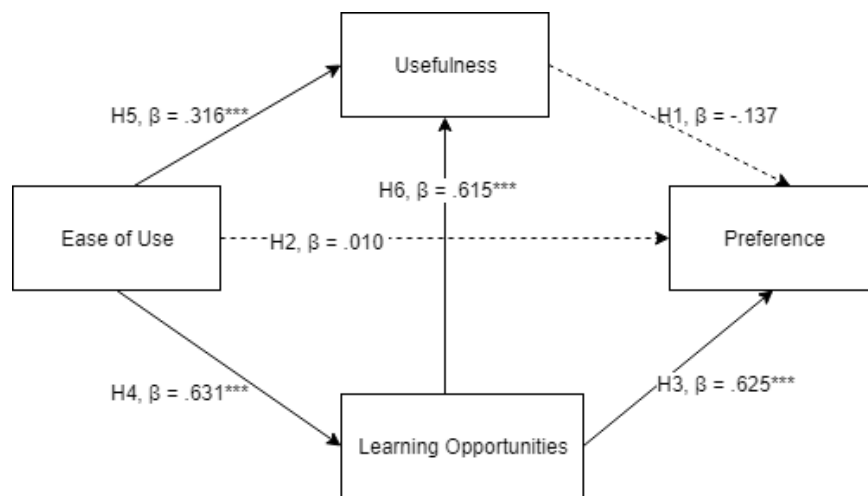

Figure 5. The Final Model (N = 371)

As discussed before, male and female groups do not have a bivariate correlations with the four constructs: learning opportunities, ease of use, usefulness, and preference. To examine whether gender difference would impact relationships between variables, I re-ran the structural model as a multi-group model by gender. I got a model for male participants (n = 330) and another one for female participants (n = 41). Table 13 shows the path coefficients matrix of the two models based on gender. Table 14 shows the indices of the goodness of fit of the two models.

Table 15
Path Coefficients of the Hypothesized Models on Males (n = 330) and Females (n = 41)

Hypothesis	Standard Regression Weights Male/Female	S.E. Male/Female
H1: USE→PRF	-.338/.419	.354/.608
H2: EOU→PRF	-.031/.321	.133/.321
H3: LO→PRF	1.280***/-.016	.318/.069
H4: EOU→LO	.563***/.332	.098/.150
H5: EOU→USE	.200*** /.282	.055/.133
H6: LO→USE	.454***/.600	.055/.293

*** P < .001

The path coefficients matrix shown in table 15 suggests that the relationships between variables are different based on gender. For the male group, Learning Opportunities positively impact players' preference for using MMORPGs to learn English vocabulary (H3, β = 1.280, p < .001). Learning Opportunities is also a predictor factor for Usefulness (H6, β = .454, P < .001). Ease of Use positively predicts both Learning Opportunities (H4, β = .563, P < .001) and Usefulness (H5, β = .454, P < .001). In addition, 69% of the variance in players' preference for MMORPGs could be

explained. For the female group, there is no significant relationship between any two

variables. Only 43.7% of the variance in players' preference could be explained.

Table 16
Goodness-of-fit Indices of the Hypothesized Model on Males and Females

	CFI	TLI	NFI	GFI	RMSEA	SRMR
Male (n = 330)	.964	.952	.932	.944	.056	.046
Female (n = 41)	.800	.731	.657	.741	.137	.085

The model fits are different across the gender groups too. The six indices of the

model for males (n = 330) suggest a good model fit. It has a CFI value of .962 and a TLI

value of .952, both of which are considered a good-fitting model. The RMSEA value is

.056 and SRMR value is .046, which are both less than .06, suggesting a good model fit

(Hu & Bentler, 1999). The GFI and NFI are higher than the threshold of .90 (Cope,

Harju, & Wuensch, 2001; Tabachnick & Fidell, 2001). In contrast, the indices of the

model for females (n = 41) suggest a poor model fit. The values of CFI, GFI, TLI, and

NFI are all lower than the suggested criteria of .90. The value RMSEA and SRMR are

.137, and .085 respectively, both of which are higher than .060, suggesting that the model

fits poorly with the data.

Figure 6 represents the structural model for males (n = 330). Figure 7 represents

the structural model for females (n = 41). Results of the path coefficients between the

variables are shown in the figures. I used a solid arrow line to indicate a significant

relationship between the variables and a dotted arrow line to show a non-significant

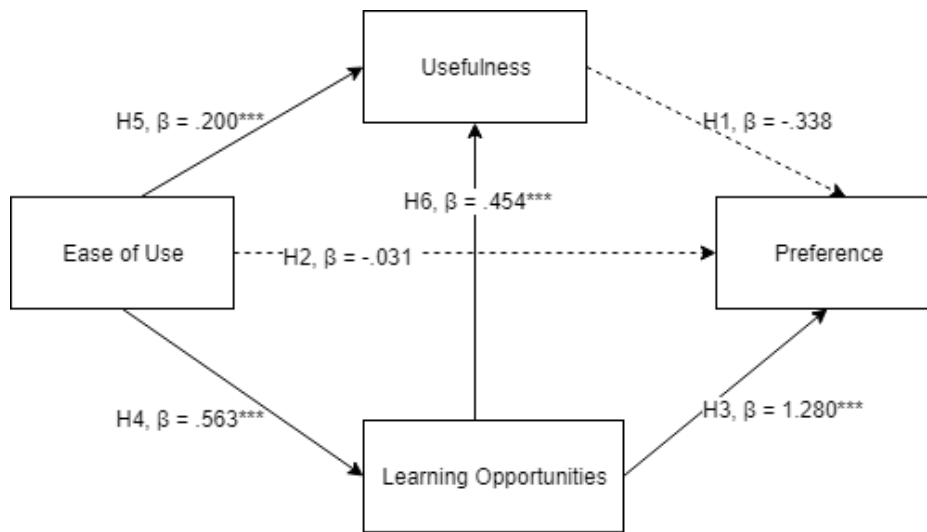relationship between the variables.

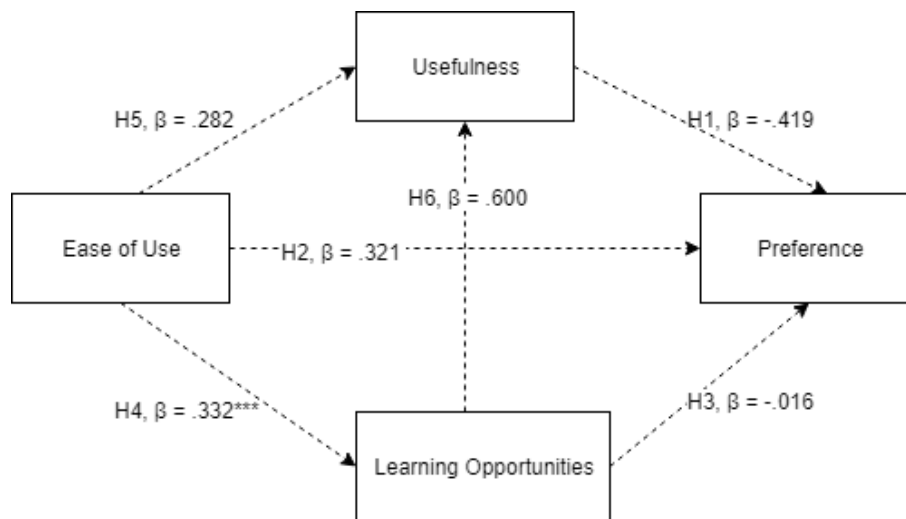Figure 6. The Structural Model for Males (n = 330).

Figure 7. The Structural Model for Females (n = 41).

It is clear that although males and females do not differ systematically on their levels of the four constructs, they do result in different structural models, meaning the relationships between the constructs are different by gender. Results of the model for males (n = 330) are very close to those of the original model with participants included (N = 371) because they support the same hypotheses and both models fit well with the

data, while the model for females (n= 41) does not show any significant relationships between the variables, meaning it does not support any hypothesis. The poor model fit for the female group might be caused by the small sample size (n = 41) since a sample size of 200 is widely considered as the minimum for running SEMs (Boomsma, 1982). I will address this limitation in the Discussion chapter.

In summary, the first, quantitative phase of the study aims to identify the factors that predict players' preference for using MMORPGs for learning L2 English vocabulary. Data for this study was collected from 371 MMORPG players. Based on an existing instrument measuring students' preference for using video games in classrooms, I proposed and validated a new instrument on players' preference for using MMORPGs to learn English vocabulary by performing factor analysis and an internal consistency test. Then, I specified a structural model that tested the assumptions, depicting the predictors that impact players' preference and explaining the relations between the variables. The model suggests that learning opportunities is the only important factor predicting players' preference. Ease of use directly impacts learning opportunities and usefulness, having an indirect influence on players' preference. The model fits the collected data well, meaning that the model is reliable and valid. Finally, I re-ran the structural model by gender and generated separate models for male and female participants respectively. The different models indicate that the relationships between variables are different by gender. However, due to the small sample size of the female group (n = 41), more investigations are needed to validate the results.

Phase Two: Qualitative Study

This study used a qualitative interview approach to explain why certain factors have a significant impact on predicting participants' preference of using MMORPGs to learn English vocabulary and how these factors work in facilitating their learning process. In other words, this study intends to investigate how and why MMORPGs can facilitate ELLs to acquire vocabulary. This section describes the results of data coding and theme development.

Data Coding. The preliminary coding work yielded 338 codes as significant to the study. After a close examination of the code reports produced by ATLAS. ti 8, I carefully re-read the codes and the transcripts, compared the similarities and differences, and then cleaned the redundant codes, which resulted in an Excel spreadsheet with 248 codes. A codebook was generated with each final code on a three-column spreadsheet, on which the codes, types of coding methods, and examples were listed. Table 15 shows an excerpt of the codebook with selected codes and examples.

After the first cycle, I read the 248 codes repeatedly to compare the similarities and differences. Then, I sorted the 248 original codes into 8 categories. One hundred and eighty codes were grouped into the predetermined categories: Learning Opportunities, Usefulness, Ease of Use, Preference, and Playing Experiences. Three new categories emerged from another 65 codes: Classroom Instruction, Suggested Implications, and Ways of Learning English. Three codes were removed from the coding because they couldn't be categorized into any of the 8 groups. Table 18 shows the frequency of the response to the 8 code categories.

Table 17
Except from codebook with codes, resources, coding types and examples

Codes	Data Source	Coding Type	Examples
communicate in English	Interview	Open coding	You have to talk with Americans or people from other countries.----Yasmin
read quests	Interview	Open coding	You started with this long texts with your mission, or your quests. I didn't know what the quest was, I just I couldn't read them. ----Cody
suggestion	Interview	Open coding	I think it should be choice. So if there are people really don't like playing MMOs, and they So giving them a choice like your homework for today is choosing between playing a game listening to five songs or watching movie. ----Cody
play a lot of video games	Interview	Open coding	The video games is my primary entertainment source.----Beth
Dislike reading quests.	Interview	Open coding	I would not pay much attention to the quests. ----John
do not focus too much on the community	Interview	In Vivo coding	Right now MMORPGs are designed not focus too much on the community. -----John
stories of *WOW*			*WOW* has a lot of stories of histories, although not real. It has been published in several books. ----Yasmin
a real life involvement	Interview	In Vivo coding	Well that is a real life involvement, I would say. Because I would learn how to, how to say that word and I'll start saying them properly and probably using them more. ----Beth

Theme Development. As previously stated, qualitative data analysis is a cyclical

process involving several rounds of first and second coding work. After revisiting all of

the extracted data, the original 9 categories were regrouped into 6 data clusters: Learning

Opportunities, Ease of Use, Playing Experiences, Usefulness, Suggestions, and Ways of

Learning English. Ultimately, three overarching themes relating to players' experiences

and perceptions towards learning English vocabulary by playing MMORPGs emerged

through the data analysis process: MMORPGs promoting English vocabulary

acquisition, MMORPGs providing rich learning resources and opportunities, and

integrating MMORPGs into traditional classroom instruction. An initial thematic map

(See Figure 8) showing the three candidate themes was created to help me understand the

relationship between codes, categories, and different levels of themes (Braun & Clarke,

2006).

Table 18
Frequency of the Response to the Categories

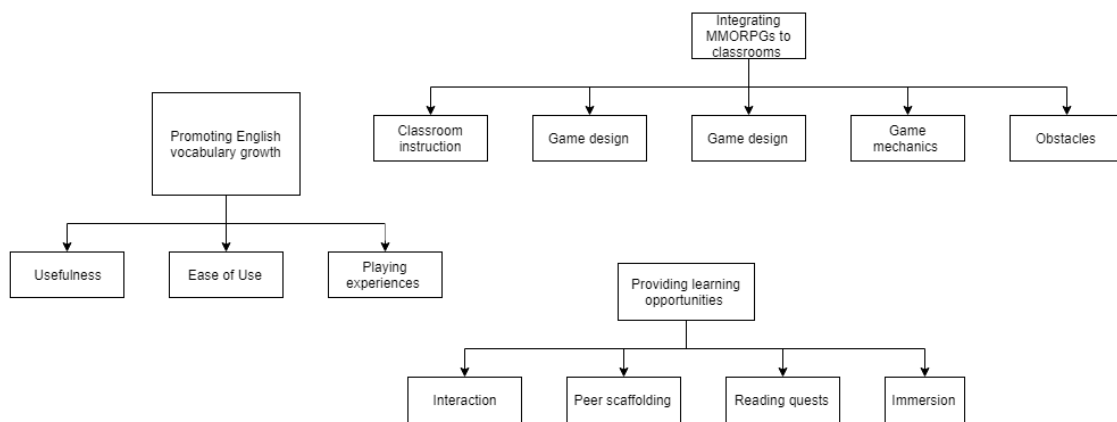|	Code Categories	Frequency
Prior Categories	Usefulness	39
	Ease of Use	12
	Learning Opportunities	67
	Preference	3
	Playing Experience	59
Emergent Categories	Classroom Instruction	33
	Suggested Implications	22
	Ways of Learning English	10

Figure 8. The initial thematic map of three main themes.

After a repeated examination of the relationships represented in the thematic map,

the initial three themes were considered as accurate representations of the whole data set.

First, I read all the codes and categories under each theme and found a coherent pattern within each theme. Then, I examined the associations between each theme and the data extracts and made adjustments accordingly. For example, I moved "Ease of Use" from the theme ***MMORPGs promoting English vocabulary acquisition*** to the theme ***MMORPGs providing rich learning resources and opportunities*** after a repeated reading of the transcripts, which indicates that participants' responses to this concept are more related to suggestions than experiences. By using Patton's (1990) dual criteria of internal homogeneity and external heterogeneity, I believe that the data within the three themes are coherent and meaningful, while the themes are clear and distinct from each other (Braun & Clarke, 2006). Last, I cleaned up the thematic map by refining the main themes, discarding unnecessary sub-themes and combining data extracts into different categories. Ultimately, three themes—***MMORPGs promoting English vocabulary growth, MMORPGs providing learning opportunities***, and ***introducing MMORPGs into traditional instruction***—are considered as accurate reflections of the data set.

Specifically, the first theme, ***MMORPGs promoting English vocabulary acquisition***, represents players' experiences and their reflections on the English learning process by playing MMORPGs. The essence of this theme relates to how players experience vocabulary growth. The second theme details what players believe why they could obtain vocabulary development through playing MMORPGs. The essence of this theme lies in how players understand their learning process. The third theme describes the implications that players proposed, which emerged when the participants made thoughtful reflections on their playing and learning experiences. A final thematic map

(Figure 9) was formulated after a further refinement of themes and a reexamination of the relations among the codes and themes.
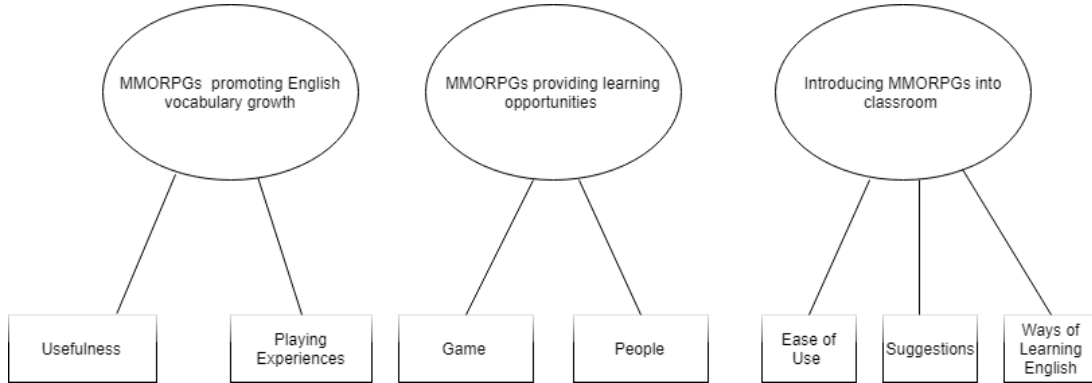

Figure 9. The final thematic map.

To illustrate the qualitative data analysis process, starting from interview transcripts data to developing the three themes, I created a visual model (see Figure 9) of this study's approach to qualitative analysis by adapting an example by Ivankova (2002).
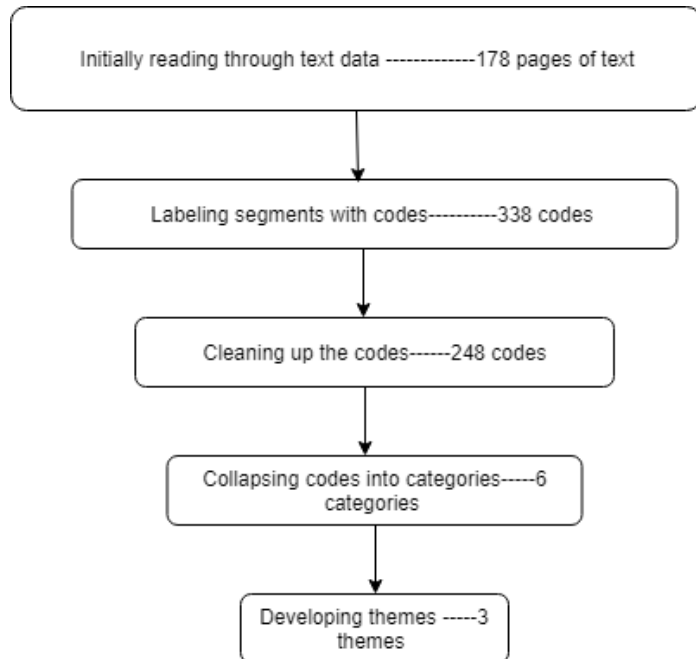

Figure 10. A visual model of the qualitative data analysis.

In the following section, findings of the study will be illustrated by a data-embedded analytic narrative (Braun & Clarke, 2006; Creswell, 2005). Live examples and direct quotes from the interview transcripts will be used to highlight the essence of the findings. Arguments depicting the findings in relation to research questions will be presented at the end (Braun & Clarke, 2006).

Theme One: MMORPGs Promoting English Vocabulary Acquisition**.** The participants started playing MMORPGs for different reasons. Eight of them started playing MMORPGs because their friends introduced it to them. One was introduced by her mother, and one became interested in MMORPGs because she enjoyed watching a cartoon that adopted the storylines of *World of Warcraft* (*WoW*). Although their playing experiences are diverse (See Table 19), all of them expressed that their English proficiency and vocabulary has been enhanced by playing MMORPGs.

Table 19
Demographics of the interview participants (n = 11)

No.	Name	Age	Gender	First Language	Education Background	Weekly playing time (hr/week)	Years of Playing
1	Beth	26	Female	Brazilian Portuguese	Some college credits, no degree	16-20	14
2	Toby	27	Male	Italian	Master's degree	12-15	12
3	Cody	19	Male	Dutch	High school graduate	8-11	7

4	Ellen	38	Female	French	High school graduate	30-40	15
5	Andy	25	Male	Dutch	Bachelor's degree	8-11	13
6	John	30	Male	Spanish	Some college credits, no degree	35	18
7	Victor	28	Male	German	High school graduate	30	10
8	Andrew	19	Male	Russian	High school graduate	4-7	5
9	Izzie	21	Female	Serbian	High school graduate	12-15	14
10	Pablo	25	Male	Polish	Some college credits, no degree	16-20	10
11	Yasmin	23	Female	Chinese	Bachelor's degree	4-7	4

When being asked about how much of their English vocabulary they believe that they have acquired from playing video games, the responses included "more than half," " maybe 60% or 70%," "a big portion," "a lot," "70%," "60%," and "mostly." Toby added value to this theme by sharing the story of how MMORPGs, especially *World of Warcraft*, motivated him towards learning English by himself. Toby likes technology in general and has always been "fascinated with video games," but the "very little" English skills he acquired from school made it hard for him to play his favorite MMORPG *World of Warcraft*. He struggled a lot to figure out different ways to learn English in order to

understand the stories and missions of this "huge world." However, four years later when *World of Warcraft* was finally released in Italian, Toby tried it for one day and switched back to the English version, because he "was so used to playing it in English" and "the Italian translation looked stupid." At present, Toby is working as a software developer in London. He recalled the first time interacting with people in English for a job interview:

> My first conversation in English was for the interview of the job that I was going
> to do in Geneva. So I was super nervous because it was my first conversation in
> English in my life. You know, I only played *World of Warcraft* and watched
> movies...When I had to take the conversation with the one that would become my
> boss in Geneva, I was super nervous, but it went good and I was so happy. I was
> so so proud of myself.

Toby's story of learning English to play games is not unique among the participants. For example, Andy had to learn English because he "want(s) to progress" in game. Pablo learned a lot of "casual vocabulary" to communicate with native English players. John used to have a strong attitude towards learning English, stating that "I hate the English class," "I don't see a point," "why do I need to learn English," and "I don't want to learn something that I will not see any uses." However, gaming illustrated the practical uses of learning English: "until I started playing MMORPG games, then they were like, I need I like I cannot play this thing if do not understand, so I ended up by going to look for my dictionary to see where I was going." Andy demonstrated a vivid example of how MMORPGs compelled him to learn English:

I want to be good at this game. I want to progress. I want to become like cutting

edge of doing Dungeons. Those kind of things, or just beating other people at the

game. To do that, you have to work together with other people...I remember I was

there just listen for the whole evening to see what level their English is. Then, if I

can understand and I know an answer to a question, I would say something...I

think my motivation to that was indeed progressing through the game.

Some participants, like Cody and Izzie, are not only motivated by the desire to

play MMORPGs, but also by a clear intention to learn English. It is evident that their

responses demonstrate more self-awareness of their language proficiency that has been

developed with their gaming experiences. For example, Cody was "intrigued by English"

the first time he watched National Geography on TV. However, watching TV shows and

trying to understand them is "way too hard" for a 10-year-old kid. Two years later,

through friend's introduction, he was intrigued by MMORPGs as well. He described the

double motivations MMORPGs have brought to him:

I really like the fantasy of playing a game, being in another world, and being a

character in a weird world. And the main language being English made it way

more fantastical for me because it was also another language...I had to learn

English if I wanted to play the game. And I also just wanted to learn English. One

of the reasons why I get longing into the game was because I wanted to learn

English. Not really consciously, but now when I look back to it, I remember being

fascinated by the fact that it was in another language.

Driven by this strong dual motivation, Cody started to play MMORPGs when his English was limited to several basic words, like "yes," "no," "Okay," and "Goodbye." But several years later, his English "stood out" because of playing *World of Warcraft*:

Well, at first I didn't notice that it was *World of Warcraft* that taught me English. Just a few years ago when I started to look back on how I learned English because my English was always good at high school. I always got good grades and I'm never really bothered with it. I wasn't a really good high school student, so English really stood out for me because of good grades for it. So I started wondering how I learned English and the answer I got was *World of Warcraft*.

Similar to Cody, Izzie was interested in learning English. Izzie was born and raised in the Netherlands, and her first language is Serbian. Her bilingual environment made her "daring and into learning a language." She started to play games at 7 and began to "imitate people" to learn English at the same age. She repeatedly claimed that her experiences of learning English by playing MMORPGs are "very positive." She described the positive aspects of MMORPGs from the perspective of a current English teacher:

I was often surprised by how difficult and proficient the language games use...That's very advanced language...I'm really surprised by the grammatical correctness in games. So I think games is a very good example of English...Even now, I often have to look up words and learn how to use these words.

While most participants used MMORPGs as a major source to acquire English knowledge either consciously or unconsciously, Yasmin played MMORPGs to help her

adapt to American culture as an international student. When Yasmin came to the U.S. for the first time, she felt frustrated. Although she "studied English very hard" and "got good grades" at school, she found that what she learned is "not English." She felt intimidated and dared not speak to people until she played MMORPGs on an American server for a while, after which she felt relieved because "Americans are normal people" and they are "not scary." Yasmin's story does not directly reveal her long-term language development by playing MMORPGs, but her temporary gaming experiences with native English players, to some extent, accelerated her adaptation to American English.

Ellen is the only participant who makes video games her career. Her current job is a content creator, doing live streaming of playing MMORPGs on twitch TV and making MMORPGs-related videos on Youtube. Ellen is fascinated by the seemingly contradictory aspects provided by video games: the peace of escape, and the "community and boundedness." She enjoys communicating with people from all over the world, so she decided to switch to an international server from the French-speaking server. And since then, her English was greatly improved due to "daily immersion" and "constant practice." Now, Ellen has almost "abandoned" her native language, doing all her live streaming and videos in English on a daily basis. By comparing her experiences of learning Dutch and English, she concluded that motivation leads to different results:

> In Belgium, we are forced to learn (Dutch) because we are a country of two
> languages: French and Dutch...So we were imposed to learn that very young, so it
> started at six. Generally you hate it. So you don't want to do it. The teacher does
> not find a way to motivate you because it's always 'you need to learn Dutch to

have a job or grades.' I used the language to connect another human being, not because I have to find a job, or because I have to pass the examinations, that's not enough. It's like me I learned Dutch for 9 years, a lot more than English. And I forgot everything...I've lost 9 years doing nothing.

The first theme ***MMORPGs promoting English vocabulary acquisition*** described why players experience growth in their English language vocabulary by playing MMORPGs. It shows that players experienced considerable language enhancement because they were driven by a strong motivation to learn English. Players are also aware of their language development throughout the gaming activity. It also demonstrates that MMORPGs are intentionally used by some players for language learning and other purposes. The second theme, ***MMORPGs providing learning opportunities***, will describe what players believe are important learning opportunities provided by MMORPGs. This theme captures how players understand their learning process.

Theme Two: MMORPGs Providing Learning Opportunities**.** The second theme emerged when participants detailed how they perceived their learning processes taking place. It started with how participants defined MMORPGs and why they enjoy playing them. Their definitions of MMORPGs explained the perceived unique characteristics of this special game genre, which gave insight into the following explanations of their individual learning experiences. A consistent pattern within this theme focuses on how participants, although different in terms of playing habits and learning styles, encountered rich learning resources embedded in MMORPGs.

Every participant was asked to give a definition of MMORPGs. Generally, they described MMORPGs as a "really big world" or "a huge virtual world" where "thousands of people" can play at the same time "in real time." It is a world of fantasy in which you have to do certain things in this world to progress. In this world, "there are a lot of possibilities" and "what the person is doing is up to him." Casual gamers like Toby could just "go through the story, enjoy the setting of the game" and "do it alone," while for hardcore gamers like Andy, it's "all about grouping up with other people to achieve different tasks to reach higher to do something you can't do alone." Izzie added that MMORPGs are not "just chatting and killing monsters" because you "have various things to do" and to "build on." Similarly, Cody claimed that one of the differences between MMORPGs and regular video games is that "you do 50 different things in an MMORPG." Participants also shared their understanding about the role-playing aspect of MMORPGs. Pablo believed that players "role-play the character, acting like a magician, warrior, or defender." Beth described the role-playing part as "a simulation game," and players are "pretending that they are the characters." However, she stressed that MMORPGs are different from regular RPGs in that "you play with a lot of people at the same time in real time."

When asked the reason why they love a MMORPG (or MMORPGs) so much that they could play it (them) for years, Toby described his favorite MMORPG—W*orld of Warcraft*—in terms of the game quality:

> The quality of the game is very high and there are very few bugs. And they
> perform regular maintenance of the game...through the years they kept releasing

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new expansions, they keep adding new content to the games, so the game is always fresh and new.

Andy, as previously noted, enjoys making progress in the game. He's "deeply invested" in this huge world, because "everything is possible" and "you could be anyone or anything you like." So the more he plays, the more he is intrigued by the stories and laws behind this world.

Other participants, including Beth, Ellen, Yasmin, and Victor, like the social aspect of MMORPGs. The opportunity to communicate with other players "to get certain goals" is not available in other games, said Victor.

Their descriptions of MMORPGs make it clear that this is a special game genre that entails distinctive characteristics from other types of video games. For example, MMORPGs feature a huge world with endless possibilities, and everyone is allowed to survive this world in his/her own way. The following section will use examples to demonstrate how different players acquire English, especially vocabulary, by using different learning resources in this huge world.

As I stated previously, the interview protocol was formulated to ask open-ended questions first, followed by questions targeting the predetermined categories (Assarroudi et al., 2018; Hsieh & Shannon, 2005). "Learning Opportunities" has been identified as an important predetermined category, because the prior stage of the study has demonstrated that the factor of learning opportunities is the only predictor that directly influences players' preference for using MMORPGs to learn English vocabulary. To further explore how this factor contributes to players' perceived preference, a focused question "What

are your major sources of acquiring English vocabulary by playing MMORPGs" was formulated to target this factor. Sixty-seven codes were collected within this category, indicating that participants are aware of the learning opportunities embedded in MMORPGs.

Generally speaking, reading texts and interacting with other players are two major sources from which players believe they have acquired vocabulary. Andy contributed to this theme by nicely summarizing how players learn by gaming:

I think the power of learning while playing is a combination of reading and a chatting in games.

Specifically, players who prefer to play solo or casually, such as Toby and Yasmin, attributed reading the game texts as the major sources of their vocabulary development, while players who are not a "fan of reading," such as Izzie and John, perceived interacting with other players as the most important opportunities. Other participants claimed that both resources have been actively used.

When I asked him to reflect on how he was learning by playing, Andrew demonstrated a vivid example of how he obtained the meanings of new words by trial and error when he started to play MMORPGs with very limited English knowledge:

The easiest one was the Exit button. I saw it in every single game. And when I clicked on it, my game almost always closes. It was easy to find that that means to close something or basically to exit from the game. Then the Option menu, it is the most difficult one. You just press the button, and a lot of words appear that you don't know, like resolution, graphics, and style. You are sitting there,

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randomly clicking stuff up trying to find out that. Then I learn. Well, Play button obviously is my favorite button, you know. You press it, and the game starts, which is amazing...and music, music sounds like the Russian word Музыка that makes it means music. Sound, you just cannot hear it, but it changes and it becomes louder or mute...

In addition to trial and error, "guessing from the contexts," "looking up in dictionary," "using Google Translator," and "asking people for help" are frequently mentioned strategies when encountering new vocabulary. If necessary, participants would combine their own efforts with others' help to figure out the problem. Izzie added value to this section by saying:

I check Google online, but I start to worry about the meaning behind it. Then, I would call the people I play the game with, or I would ask for chat, for example, to guild members or party members. Like 'what does this mean,' they would explain.

Toby was proud of his English because he hasn't encountered an unknown word for a long time. He provided a good reflection on why reading games requests keeps his vocabulary steadily growing:

Video games vocabulary after a while that you played is more or less recurring. So since I started playing it (*World of Warcraft*) from 2006, I know more or less every recurring term. Well when they release new expansions, you have new monsters, you have new names. So you know new monsters, new zones…

Beth, on the other hand, shared her thoughts of why interacting with people is the most important way for language acquisition:

I think talking to people is very important for learning a language because only the people that speak that language truly know how to speak their language because they're doing it every day. Words change meaning, new words come out, certain way to pronounce things are different, certain words has been new in how to use…It's hard for a teacher to cover all of these things because something the teachers doesn't even know of…because the language is always changing. So I feel like MMORPGs are in general pretty important to learn things, because you can interact with the people that are speaking those things right now.

Ellen's perception of learning by interacting goes deeper than talking. She believes that communicating by writing is the best way to acquire "high-quality" English. She explains that when she types or writes stories for her game character, she would try to look for "better" and "precise" terms than those she would use for talking. Additionally, many participants mentioned that "being corrected by others" made them consciously acquire English knowledge, including vocabulary.

Whereas the first theme, *MMORPGs Promoting English Vocabulary Acquisition*, explained why players could achieve vocabulary growth by playing MMORPGs, the second theme, *MMORPGs Providing Learning Opportunities*, described how players understand their learning process taking place while playing MMORPGs. Game texts and communicating with others comprise the major sources of learning. Strategies players have been using include trial and error, guessing from the

context, looking up terms in dictionaries or online, peer-scaffolding, and receiving

feedback from other players. The third theme, ***Introducing MMORPGs into traditional***

instruction, describes players' ideas and imaginings on introducing MMORPGs into

English classroom instruction. This theme emerged when players were asked to compare

their classroom learning experiences to their experiences of learning by playing

MMORPGs.

Theme Three: Introducing MMORPGs into Traditional Instruction**.** Although

participants are from 10 different countries, they unanimously used the word "boring" to

describe their classroom English instruction. Toby vividly described the different levels

of boredom he experienced in his English classes from primary school to high school by

using "boring," "a bit boring," "less boring," and "super boring":

> (In primary school), they would teach us like this is a pronoun, this is a noun, this
>
> is an objective, this is a verb to be, and that we had to repeat like parrots. And
>
> they would teach like the days of the week, or the names of the months, you know
>
> it's something very mnemonic and it's not really engaging. I mean for me it was
>
> very boring and in middle school it was the same. In high school we have some
>
> more grammar lessons and mostly English literature…it was boring for me as
>
> well because I'm not really fond of literature…So it was a bit boring but less
>
> boring than just grammar lessons, because grammar lessons for me was super
>
> boring.

Participants complained about the teaching and learning methods they received

from school from different perspectives. Cody's used "really boring" twice to describe

their learning English approach at school: they "got like 100 words and a few new grammar methods" every month and they "had to connect those things." While Yasmin's teacher asked them to "recite" words or passages and "do exercises," Pablo's teacher would check one word after another to ask questions like "do you remember this?" Ellen started to learn by "having paper with words" and then "translating and learning the words." Izzie and Victor disliked English class because it was neither "interactive" nor useful in real life. Beth felt that it was hard to "absorb" anything from English class, whereas John "don't remember" anything about learning English from school. Andrew liked the class for a while, but felt bored later. But he used to have a "cool" teacher who allowed them to "watch films or something."

Andy expanded on his answer by observing that teaching vocabulary in an isolated way is one of the reasons why English class is ineffective:

Every language we got here in high school is just very focused on just learning words, not even using the words in sentences or anything…

However, in addition to describing ineffective teaching approaches, some participants pointed out that another reason they labeled English class as "boring" is because they have already acquired the knowledge elsewhere. Izzie offered her personal experiences:

It was very boring personally because a lot of vocabulary was very familiar to me from games.

Similarly, Cody believed that some students were not engaged in class because they already had that knowledge. However, he added that those who had no prior English

knowledge felt equally bored. He divided the class into two groups and pictured how the English class bored both groups:

> There were two groups of people in English class. People who already knew English from playing games or from watching TV, listening to music, and they were always super bored in English class. Those who really only spoke Dutch and never saw English at all in their lives couldn't keep up with the class. So that was pretty funny to me because there were two groups of people and no one thought English class was helpful.

Ellen is the only participant that said she had a very good teacher doing "a great job." The way she engaged the students was to push the students to produce English "every day of the week, even during the holidays" by assigning them a lot of homework. Ellen perceived it as "engaging" and "effective," but it was not popular among other students and even other teachers. Her method was criticized for taking up too much time.

When asked whether they prefer to learn English by playing MMORPGs, they unsurprisingly offered definite and positive responses. Nevertheless, participants all agreed that school instruction, although boring, is important. Cody, for instance, noted that school instruction "works in way," but "not the best way." All participants agreed that school instruction is important for laying a foundation. Andrew proposed the importance of school instruction in terms of guidance:

> Learning something without a teacher's guidance is difficult, really. I tried to learn French by myself, but I failed.

Given the fact that school instruction is "boring" but "important," whereas learning by playing MMORPGs is "interesting" and "engaging," I asked the participants to make suggestions for integrating MMORPGs into traditional instruction based on their own experiences. Ultimately, their responses were grouped into three categories: creating classroom-friendly MMORPGs, constructing a curriculum around MMORPGs, and employing the storylines of MMORPGs for classroom use.

Both Andy and Cody stressed that if MMORPGs are integrated into classroom, it must be done from a "game first" approach. For example, Andy suggested:

> I think if they would do it now, they will do in a wrong way. Because sometimes they try to integrate game into learning, but most of the games are so boring. Not challenging. Because it is supposed to be learning first, not game first. So I think that's a very important factor to make it like a game first, then integrating it into a learning process.

Cody shared very similar opinions as Andy. He said:

> I learned English *World of Warcraft*, but I learned because I liked *World of Warcraft* first. Then, English came with it. So making a game and then telling students that they should start playing a game, so they will learn English. I don't think that would work, because students always do the opposite of what the teacher says.

Andy further proposed his ideas on how to take a "game first" approach in the English classroom. He suggested a collaboration among game designers, educators, and students to create a game as a project:

Look at the big and giant pictures of MMORPGs today. There would definitely be some universities or some programming schools for this task, creating game as a project…It's necessary to create a specific game to be used in class because you need all these different setting…you need a server for the classroom, or you can figure out how you get multiple classes on one server or guilds or something like that. I think it would be best if the game would be built with the learning in mind but it is a game first. It would be cool to try and get some schools involved…Get some students involved to actually build the game.

Similarly, Izzie stressed that it is critical to keep the "natural" learning power of MMORPGs. With both experiences of learning and teaching English as a second language, Izzie proposed an idea of "building a curriculum around the MMORPGs" by explaining how the "natural" language acquisition happens:

We learn a language when we experience fun. That's the emotional aspect of learning. Pupils also remember something way better when they do it in their own way. For example, it is not necessary to explain simple present tense if they have seen that in the context of game and they've seen how to use it. It's similar to the first language acquisition when we were a child. You don't get exposed to grammar rules, you don't get exposed to vocabulary. It's just learning by doing. That's what I think is a very great aspect of MMORPGs and curriculum being putting together.

Although their suggestions are derived from two different perspectives—creating a game versus creating a curriculum—they all argued that learning must take place naturally while gaming instead of playing games to learn.

Some participants prefer to use partial aspects of MMORPGs to classrooms to avoid the "toxic flare," "addiction," or technical difficulties. For example, participants who are attracted by the stories of MMORPGs, like Yasmin, suggested that we "introduce stories" of MMORPGs to the class or "design a simplified version" by just including the positive elements of the game.

Given to the potential challenges of using video games in the classroom, some participants suggested that adopting game mechanics to the traditional instruction would "keep people coming back" as well. For example, Ellen proposed that the reason why MMORPGs are addictive is because "they work in a certain way that really motivates people." She further explained that the motivation usually comes from daily quests, rewards, or competition. She admitted that playing MMORPGs is not always exciting:

Sometimes there are extremely boring tasks…I spent 2 hours just killing the same mobs because I want that rewards.

She wondered that "why there no teachers of any subject using this to motivate people to study more?" She proposed that game mechanics, such as reward systems or team competitions, might be used to make the classroom "game-like."

Besides using MMORPGs in a formal educational setting, some participants proposed that MMORPGs could also be used for informal learning environments. For example, Beth suggested inviting a native English speaker to play the game with students

after school. Victor proposed that playing the game and providing language instruction could be conducted interchangeably.

Being enthusiastic at the idea of integrating MMORPGs to traditional education, participants also expressed their concerns about the potential challenges. Most participants stressed that the major reason why they have acquired a large amount of vocabulary and other English skills from playing MMORPGs is because they have a keen interest in playing MMORPGs. People who don't like playing games at all probably wouldn't learn much from this approach. Cody believed that this integration should be an alternative to other approaches:

> I think it should be a choice…there are people who would rather learn English by listening to music, watching movies and doing assignments with that. So I think it would work if there are all gamers in the class.

Izzie added that, in terms of her own classroom experience, that some students "don't know how to use a computer," and they will "panic" when being asked to "use the smartphone for an App."

The first two themes, ***MMORPGs promoting English vocabulary acquisition*** and ***MMORPGs providing learning opportunities***, described how players experience and understand their learning process while playing MMORPGs. The third theme, ***Introducing MMORPGs into traditional instruction***, demonstrated players' perceptions of integrating MMORPGs into classroom. Participants indicated the ineffectiveness of traditional classroom instruction when they reflected on their learning and gaming

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experiences. Participants were encouraged to share their perspectives of introducing

MMORPGs to educational settings.

CHAPTER FIVE

DISCUSSION

The purpose of this mixed-methods sequential explanatory study is to identify and explain factors contributing to players' preference for using Massively Multi-Player Online Role-Playing Games (MMORPGs) to promote English vocabulary acquisition as a second language (L2). In the first, quantitative phase, by adapting an existing model (Bourgonjon et al., 2009) of students' acceptance of video games, I formulated a structural model identifying the predictive factors of players' preference for using MMORPGs to gain English vocabulary. Results showed that the factor of learning opportunities is the most significant predictor for players' preference. The factor of perceived ease of use has an indirect impact on players' preference through the mediation of learning opportunities. The qualitative follow-up research analysis reveals that: 1) MMORPGs are useful and effective tools for facilitating players' English vocabulary growth; 2) MMORPGs provide useful learning resources for language acquisition; and 3) educators can employ MMORPGs to classroom instruction in multiple ways. While all participants expressed strong positive feelings for learning English by playing MMORPGs, they also expressed potential challenges and problems.

This chapter will begin by connecting the findings to research questions supported by the relevant literature. It will then present the implications for practitioners and researchers. This chapter will conclude with suggestions for future research and descriptions of the limitations of this study.

Connection to the Research Questions

In Chapter Two, I provided a comprehensive review of the literature for research on video games and second language acquisition. Empirical studies spanned Computer Assisted Language Learning (CALL), connections between CALL and SLA theories, video games promoting second language acquisition, comparative studies on traditional instruction and game-based learning, using MMORPGs' to facilitate second language learning, and video games enhancing vocabulary learning for English Language Learners (ELLs). I used the relevant literature to create the survey questions and develop meanings around the themes that emerged in this study. Because previous research has neither directly explored predictive factors for players' acceptance of using MMORPGs to learn English, especially vocabulary, nor investigated how players experience and understand their learning process while playing MMORPGs, I explored this gap in the scholarly literature. To accomplish this task, I proposed two main research questions, then quantitatively identified factors that predict players' preferences and qualitatively explained the meanings of the factors through the lived experiences of the participants. The following section situates the findings of this study into the existing body of literature.

RQ1: What factors predict MMORPG players' preference for using MMORPGs to gain English vocabulary?

The purpose of the first, quantitative phase of the study was to identify factors contributing to players' preference for using MMORPGs to gain English vocabulary by obtaining statistical results from a survey of 371 participants.

The results showed that perceived learning opportunities is the only predictor for players' acceptance of using MMORPGs for learning English vocabulary, in contrast to Bourgonjon et al.'s (2010) study, which found that learning opportunities, ease of use, and usefulness are three important predictors influencing students' acceptance of video games in the classroom. However, while Bourgonjon et al. (2010) targeted secondary school students, my study focused on the perspectives of MMORPGs players. It appears that different predictors emerged when the target population and game genres are different. Second, this study confirmed Bourgonjon et al.'s (2010) hypothesis that learners will perceive that video games offer greater and better learning opportunities when they are easier to use, showing that ease of use plays an indirect role in influencing players' preference through the mediation of learning opportunities. This is in line with existing research (Sundqvist & Sylvén, 2012) that found that novice MMORPGs players showed fewer L2 learning outcomes than more experienced gamers. Less experienced players also reported more negative attitude associated with the complicated interface (Lin & Lan, 2015). In one language learning game project research, Peterson (2012) partly contributed the success of the project to the easy usage of the game. This result shows that long-term user training and instructor help is imperative before MMORPGs could be introduced to the language classroom (Godwin-Jones, 2014).

It is worth noting that my study offers implications mainly for instructing students who like playing MMORPGs because participants of this study are all MMORPG players, meaning that they have an initial preference for video games. Unlike online computer games, MMORPGs are a dynamic and complex space that involves heavy

cognitive load, social interactions, and gaming skills (Ang, Zaphiris & Mahmood, 2007), suggesting that educators must take students' initial acceptance into consideration. Language educators must bear it in mind that students' resistance to video games might hinder the important learning process of active participation (Squire, 2008). I will talk more about this later in the chapter.

Next, my study shows that gender does not have a bivariate correlation with the variables of interest, meaning there is no significant differences between males and females in their perceptions toward MMORPGs. In line with Papstertio's (2009) assertion that women players do not play less than male players, my study doesn't find significant differences between males and females in their weekly playing time. My study also supported Romrell's (2014) research that both males and females showed positive attitudes toward video games for learning. On the other hand, this result contradicts several other studies that found significant gender differences in the acceptance of video games (Bourgonjon et al., 2010; Greenberg et al., 2010; Wang & Wang, 2008) and weekly playing time (Bourgonjon et al., 2010; Greenberg et al., 2010). It is worth noting that previous research did not provide adequate descriptions of the game types and participants' gaming experiences, while my study specifically targeted MMORPG players. It appears that the issue of gender difference varies depending on game genres and personal experiences. Furthermore, I got different structural modes based on gender, which might indicate that males and females do not differ at a systematic level to the variables of interests, but the relationship between variables are different based on

gender. This result suggests that researchers need to conduct further investigations on gender issues to address the current controversies.

RQ2: Why are the factors, tested in the first phase, significant predictors of players' preference for using MMORPGs to facilitate English vocabulary acquisition?

The goal of the second, qualitative phase of the study is to interpret the statistical results obtained from the first quantitative phase and provide further implications for educators. In this phase of the study, I interviewed 11 purposefully selected participants to enhance the depth of quantitative results. I performed a combination of directed content analysis and thematic analysis for comparing categories and themes. Ultimately, a data-embedded analytic narrative described the three themes that emerged from the transcripts data.

My first theme, ***MMORPGs promoting English vocabulary acquisition***, speaks to the first subquestion: Because of gameplay, how do MMORPGs enhance ELL players' English vocabulary growth? As previously discussed, participants collectively claimed more than half of the English knowledge they gained is from MMORPGs. For example, Cody claimed that 50% of his English knowledge was learned by playing MMORPGs. John said 60%, while Izzie said 70%. This finding supports many prior studies that MMORPGs play a significant role in promoting L2 learning outcomes (e.g. Bytheway, 2014; Chik, 2014; Peterson, 2011; Rankin et al., 2009; Thorne, 2008; Zheng et al., 2010), and vocabulary in particular (Rankin et al., 2009; Sylvén & Sundqvist, 2012).

Motivation. Players reflected on influential memories that spoke to their noticeable development of English skills, showing that motivation is the main reason why

playing MMORPGs is a significant contributor for their English language acquisition. This finding is consistent with the results of a longitudinal survey research on user motivation (Yee, 2006). Participants in my study reported the motivational factors of achievement, relationships, immersion, and escapism throughout their stories. For example, some participants reported that they are driven by the desire of being "cutting-edge at doing Dungeon," escaping from the real world, or enjoying the bonding of the gaming community. One participant, Beth, described that playing MMORPGs was the only way for her to connect with people when her mother passed away. However, the manipulation factor identified by Yee (2006), which measures "how inclined a user is to objectify other users and manipulate them for his personal gain and satisfaction (p. 318)" was not clearly addressed by my participants. One reason might be my small sample size (N = 11) in contrast to Yee's (2006) large-scale study (N = 6675). To sum up, this qualitative study showed similar results of prior research in that heterogeneous motivational factors appeal to the players across gender, age, and ethics (Steinkuehler, 2010; Yee, 2006).

In contrast to prior research (Bytheway, 2015), which found that no motivational learning occurred in the MMORPGs context, some of my participants reported that they intentionally learned English by playing MMORPGs. For example, Cody spoke of his passion for the dual motivation of playing games and learning English, stating that the "main language being English made it *(WoW)* way more fantastical." Because there is no version available in his native language, Dutch, he "had to learn English" if he wanted to play the game, but he also "just wanted to learn English." This aligns with Chik's (2014)

research, which found that language learning motivation can drive players to turn gaming experiences into learning experiences in an intentional way. My research implies that educators can use MMORPGs intentionally for language learning. My participants did not provide a detailed description of how they intentionally gain English knowledge by applying certain learning strategies, but their assertion that they used MMORPGs for L2 learning has provided evidence for a promising avenue of future research.

The language learning environment. My study shows that the design of MMORPGs provides a rich, immersive, and sustainable English learning environment for ELLs. Participants perceived MMORPGs as appealing because MMORPGs provide endless possibilities, high-quality gaming experiences, ubiquitous social interactions, and the continuous release of game expansions. These features are in line with Peterson's (2012) research, which found that MMORPGs are distinctively designed to produce meaningful interaction that facilitates L2 learning. Players are immersed in a high-quality story-based virtual world, and they are driven to elicit purposeful interactions by using text or voice chat. The design features of MMORPGs ideally meet the key requirements of an effective L2 learning setting (Zhao & Lai, 2009): rich input, adequate use of the target language in an authentic environment for meaningful purposes, quality negative feedback, and individualized instruction.

Findings of my first theme answer the first sub-question: As a result of gameplay, how do MMORPGs enhance ELL players' English vocabulary growth? My findings show that by driving players with strong motivation and immersing them into an ideal L2

learning environment, MMORPGs positively facilitate ELLs' English vocabulary acquisition.

My second theme, ***MMORPGs providing learning opportunities***, is in response to the second sub-question: How do MMORPGs provide sufficient learning opportunities for ELL players to obtain English vocabulary? In line with existing research (Squire, 2005; Steinkuehler & Squire; Zhao & Lai, 2009) that shows that MMORPGs provide rich learning opportunities, my study showed that game texts and social interaction are major learning resources for language learning in the context of MMORPGs. Reading game texts is an action to understand and explore the missions by interacting with narrative, which would stimulate interaction with other players (Susaeta, 2012). My findings are promising when viewed through the lenses of the *Interactionist Hypothesis* (Long, 1981; Gass, Mackey & Pica, 1998) and socio-cultural theory (Vygotsky, 1978), both of which hold that interaction is the key factor for learning. While reading game texts aligns with the *Interactionist Hypothesis* (Long, 1981; Gass, Mackey & Pica, 1998), which stresses the cognitive learning process within an individual's mind, interacting with other players to co-construct meaning speaks to the social aspects of learning in socio-cultural theory (Vygotsky, 1978).

Learning strategies through interaction. My study shows that participants actively used vocabulary learning strategies while playing MMORPGs. According to second language acquisition research (Griffiths, 2008; Gu, 2005; Schmitt, 1997), learners consciously use a combination of strategies to acquire, retain, recall, rehearse, and use words. In line with their research, I identified 15 vocabulary strategies used by my

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participants. My study supported Bytheway's (2015) research that players are flexibly using a range of vocabulary learning strategies to gain English words when they play MMORPGs. The learning strategies reported by my participants are highly congruent with Bytheway's (2015) results. To make it easy to compare the results, I adopted the terminologies created by Bytheway (2015) and presented the comparison in Table 12.

My research confirmed most of Bytheway's (2015) conclusions on vocabulary learning strategies used by players. The only contradictions are "using knowledge of another language" (Schmitt, 1993) and "selecting the word for attention." These differences may be a result of the self-reported nature of interviews in that participants may have been unaware of the strategies they used.

Table 20
Comparison with Bytheyway's (2015) Strategies

Bytheway (2015)	Learning Strategies Identified in This Study	Examples
interacting with players	interacting with players	"I feel like MMORPGs are in general important to learn things because you can interact with the people that are speaking those things right now" (Beth)
playing in English	playing in English	"There is only English version" (Cody)
reading in-game information	reading game quests	"when clicking your quest, you get a detailed description of what you have to do" (Cody)
looking up words	looking up words	"I ended up by going to look for my dictionary to see where I was going" (John)
noticing frequency/repetition of words	noticing frequency/repetition of words	"Video games vocabulary after a while you played is more or less recurring" (Toby)

requesting/giving explanations	requesting/giving explanations	"I would call the people I play the game with, or I would ask for a chat, for example, to guild members or party members" (Izzie) "There was a point of time when actually it was me who was that 'friend' being asked" (Andrew)
equating images/actions to word	equating actions to word	"Play button obviously is my favorite button, you know. You press it, and the game starts" (Andrew)
recognizing the knowledge gap	recognizing the knowledge gap	"Normally it's not some words I don't know. It's how they shorten the phrases into some capital letters" (Yasmin)
receiving/giving feedback	receiving/giving feedback	"I know I've been corrected" (Beth) "I've been through and I really try when I see French speaker, I really try to encourage them nicely" (Ellen)
noticing in other contexts	noticing in other contexts	" 'Music' sounds like the Russian word 'Музыка' that makes it means music" (Andrew)
guessing from context	guessing from context	"I think it was guessing from the context '(Cody)
observing players	observing players	"I remember I was there just listen for the whole evening to see what level their English is. Then, if I can understand and I know an answer to a question, I would say something" (Andy)
adding to the existing knowledge	adding to the existing knowledge	"A typical expression like 'by the way', it's not something I knew before, not something I'd learn at school, but it's something you hear all the time from someone say 'by the way', then you start to understand what that means what is the real meaning of it not the literal translation that means nothing to you" (Ellen)

using word to learn word use	using word to learn word use	"You just press this button, and a lot of words appear that you don't know, like resolution, graphics, style, and you're sitting there randomly clicking stuff up trying to find out that" (Andrew)
selecting words for attention	N/A	N/A
N/A	using knowledge of other languages	"I'm Dutch, I mean English and Holland relate to each other" (Cody)

My second theme, ***MMORPGs providing learning opportunities***, corresponds to the second sub-question of this qualitative study: How do MMORPGs provide sufficient learning opportunities for ELL players to acquire English vocabulary? I answered this research question by asserting that game texts and social interactions comprise the major learning opportunities in the context of MMORPGs. While these learning opportunities enable the players to accomplish the game quests, they are consciously using a variety of learning strategies to achieve their goals. I identified 15 learning strategies: *interacting with players*, *playing in English*, *reading game quests*, *looking up words*, *noticing frequency/repetition of words*, *requesting/giving explanations*, *equating actions to word*, *recognizing the knowledge gap*, *receiving/giving feedback*, *noticing in other contexts*, *guessing from context*, *observing players*, *adding to the existing knowledge*, *using word to learn word use*, and *using knowledge of other languages.* I also made a comparison with Bytheway's (2015) findings on learning strategies MMORPG players are actively using, concluding that my study supported the prior study.

My third theme, ***Introducing MMORPGs into traditional instruction***, presents players' perceptions of how to integrate MMORPGs into the classroom to promote

language learning outcomes. While the current educational system is preparing students for the industrial age (Kellinger, 2017), the dynamic digital world is calling for creativity, critical thinking, collaboration, and communication skills (Shute, 2011). Language educators have the responsibility to narrow the achievement gap between school education and 21-century skills. Unfortunately, every participant I interviewed expressed dissatisfaction with language education at school. While Krashen (1987) proved decades ago that traditional language instruction methods of Grammar-Translation do not lead to effective vocabulary acquisition, my participants reported that Grammar-Translation were the major instructional approaches they experienced in school. This finding aligns with Suh et al.'s (2010) research that "repeating the contents of textbooks in isolated ways" is a typical instructional approach in the L2 classroom (p. 371). To address this problem, my participants proposed a variety of solutions to enhance engagement and interaction for language instruction. The following section will relate the suggested approaches to existing literature.

Using or designing curricular MMORPGs. While participants are enthusiastic about introducing MMORPGs to the traditional classroom, they expressed concerns of directly using commercial, off-the-shelf MMORPGs in the classroom, which parallels with Reinder's (2009) research that access to technologies and cost associated with video games are major drawbacks for using them in classrooms. Also, a variety of linguistic features, including vocabulary use and syntactic structures, cannot be pre-determined by playing commercial, off-the-shelf MMORPGs (Godwin-Jones, 2014). One solution my participants proposed is to design educational MMORPGs that meet curricular

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requirements. Meanwhile, they emphasized repeatedly the importance of the "game first" rule, which echoes the suggestion proposed by Klopfer et al., (2009) that educational game designers should "find the game in the content" (p. 31). Some of my participants alleged that current educational games are "doing wrong," noting that obvious learning tasks interrupt the enjoyment of playing the games. Their perceptions reflect the current situation of educational games, that the learning tasks are too clear (Godwin-Jones, 2014), that they are unrelated to the overall game design (De Castell & Jenson, 2003), and that they interrupt the "flow" of the game (Bellotti et al., 2013). As a result, Laurel (2001) referred to educational games as taking a "broccoli and chocolate" approach, meaning that despite their fun, attractive appearance, they lack the playfulness and engagement that occur when learning from non-educational videogames. My findings implied that making educational MMORPGs as engaging as commercial, off-the-shelf games remains challenging.

Besides using educational MMORPGs in the classroom, my participants also suggested creating educational MMORPGs via collaborations among educators, students, computer engineers, and game designers. They emphasized that involving students in the process of game creation would enhance students' engagement. This supports Godwin-Jones' (2014) study that that self-development of educational games would not only allow the educators to track the user data but also allow developers to control the language level and incorporate particular linguistic goals. More important, learners' involvement in game creation would promote their meta-cognition towards language learning.

Designing MMORPG-based curriculum. In contrast to designing curricular MMORPGs, some participants suggested building a curriculum upon the exiting MMOPRGs. This idea corresponds with Squire's (2005) assertion that educators must focus on how to use games. To successfully design MMORPG-based curriculum, my participants proposed some specific guidelines, including 1) the teachers must be familiar with the game; 2) the teachers should offer guidance and help in both gameplay and language learning; and 3) the fun of gameplay must drive the learning process. These findings support Squire's (2010) proposed teaching strategies for a game-based curriculum. Squire (2010) also emphasized that teachers should encourage active participation and online community. While Squire (2010) based his research on a successful implementation of a MMORPG called *Civilization III* into a history classroom, I drew my conclusions from the perspective of MMORPG players, meaning that players shared similar perceptions with educators on this topic.

Using MMORPG storylines. Some participants suggested that using the storyline of MMORPGs to stimulate engagement would be the cheapest and easiest way to incorporate MMORPGs into language instruction. As Yasmin said, MMORPGs' narratives have been disseminated via multiple mediums, including movies, cartoons, and books, meaning that there are multiple ways to share the stories with students. This corresponds with Reinders' (2009) recommendations of using video games to teach language without access to technology. Tomai, Martinez, and Silcox (2014) collected over 700 in-game quests from *World of Warcraft* (*WoW*) and established a corpus of short stories. They found that by using these short quests, people can produce numerous

versions of similar stories. Since storytelling has proven a useful second language

learning approach (Richard-Amato, 1988), this finding may have implications for the

usage of MMORPG stories in the language classroom.

Using MMORPGs for informal learning. Last, some participants suggested that

using MMORPGs in informal educational settings may bridge the gap between school

education and extramural learning. This finding supports Sundqvist and Sylvén's (2012)

discovery that students' English proficiency level is positively correlated with the time

they spend playing digital games. For example, Cody's English performance surpassed

that of his classmates. Izzie felt bored in class because she had already gained the English

knowledge from games. Some participants suggested that teachers playing with the

students outside of classroom could be a "stress-free" approach for those who feel

uncomfortable talking in class. This supports prior research (Peterson, 2012) that suggests

that the low-anxiety and sense of security provided by digital games can stimulate more

effective affordances for L2 learning than in the classroom. My study also aligns with

Sundqvist and Sylvén's (2012) suggestion that teachers should bridge the gap between

students' out-of-school and in-class language activities to follow up on students' learning

process.

The third theme, ***Introducing MMORPGs into traditional instruction***, emerged

when I asked the participants to propose suggestions for incorporating MMORPGs into

L2 education in terms of their experiences and perceptions. Findings related to this theme

addressed the third subquestion by providing useful implications for researchers and

practitioners. I categorize the suggestions proposed by the participants into 4 subthemes:

designing curricular MMORPGs, designing MMORPG-based curriculum, using stories

of MMORPGs, and using MMORPGs for informal L2 learning. When viewing the

findings related to my third theme in light of the existing literature, it becomes clear that

research on the implementation of MMORPGs for L2 education is still in its infancy. The

following section will address the implications for both practitioners and researchers

based on the research outcomes.

Implications for Practitioners

This study depicts factors that lead to learners' preference of using MMORPGs to

gain English vocabulary knowledge. It shows that perceived learning opportunities

directly impact players' preference for using MMORPGs to learn L2 English vocabulary,

meaning that players would accept MMORPGs as a learning tool only when they realize

the learning benefits incorporated into MMORPGs. This result implies that teachers who

intend to use MMORPGs as an instructional tool should articulate the learning

opportunities provided by MMORPGs and explain why these learning opportunities are

more helpful than those in traditional classrooms. Meanwhile, this study presents the

positive impact that ease of use has on learning opportunities. This means that ease of use

indirectly influences players' preference through learning opportunities. If players feel

that playing the game is effortless, they are more likely to recognize the learning

opportunities it affords and accept it as an instructional approach. This implies that

MMORPGs introduced into the classroom should be appropriately challenging for the

learner, but not too difficult to play. Teachers should not assume that all students are

automatically familiar with playing MMORPGs. I suggest investigating the difficulty

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level of the game before adopting it for classroom usage. To do this, the teachers must be familiar with the games, including some level of proficiency playing the games themselves, as well as understanding the current research on this topic so that they can make better decisions on game choices. Finally, as Squire (2010) suggested, teachers must provide help both in game-play and language learning. Encouraging a community learning environment to enable peer scaffolding is also important in making students feel that the game is accessible.

I have previously discussed how this study offers implications mainly for instructing students who like playing MMORPGs and teachers who plan to use MMORPGs in the classroom. However, it also has meaningful implications for all language education practitioners. The second, qualitative study shows that traditional L2 vocabulary instruction is not effective because of a shortage of interaction and motivation. It presents, through the participants' experiences, reasons why traditional instruction is boring. This study implies that teachers should not teach vocabulary in an isolated way; instead, they must encourage different interactions in the classroom. For those who do not intend to implement MMORPGs in the classroom, besides using the storyline of MMORPGs, they can integrate game mechanics into the traditional language instruction for better learning outcomes. Game mechanics refers to the rules that encourage the players to explore the game space through responses to the players' actions. Typical game mechanics include competition, collaboration, community, and badges (Sicart, 2008). Teachers can create activities associated with relevant game mechanics to stimulate interaction and motivation in the language classroom.

Finally, this study offers practitioners implications for bridging the gap between formal classroom education and informal learning. The second stage interview study shows that instead of replacing traditional classroom instructions, MMORPGs can serve as complement to it. Students who prefer to learn a second language by playing MMORPGs can use them as an alternative approach in an informal learning setting. To achieve better results, the teachers must follow up these students' progress and provide guidance when necessary. As my participants suggested, the teachers may play MMORPGs with students outside of the classroom, guiding them and incorporating linguistic instructions in a less stressful way. Through these activities, the teachers can not only keep up with students' learning status, but they can also consciously bridge the achievement gap between school education and informal learning.

Recommendations for Future Research

Based on my study, I suggest future directions for related research. First, the study suggests a need for more high-quality empirical studies on using MMORPGs for second language acquisition that draw on various paradigms and associated methodologies. A recent literature review (Jabbari & Eslami, 2018) on L2 learning in the MMORPGs context revealed that most of the current research in this field is qualitative, among which more than half did not report verifications of the data. As discussed in the literature review, numerous existing quantitative studies are limited by their short game durations, very small sample sizes, and/or unjustified sampling procedures, making it hard to generalize their results to the larger population. In addition to improving the quality of their studies, researchers could conduct more studies using a mixed-methods research

design, because mixed-methods research offers a theoretically and methodologically powerful approach for replicating studies in language education (Riazi & Candlin, 2014). Given that research on using MMORPGs to facilitate L2 learning has only recently emerged, many studies on the same topics have produced different, even contradictory results, making it hard for future researchers to build on their findings. Replication studies are very important to push the field forward by validating prior findings. Replications studies with changes of variables and populations can make the existing research results more accurate and broadly applicable.

Next, future research should focus more on the actual integration of MMORPGs into L2 classrooms. Very few studies have addressed the integration of MMORPGs into the classroom to examine long-term learning outcomes. Implementation strategies such as curricular MMORPG design and MMORPG-based curriculum design targeting L2 learning represent a gap in the literature. This is understandable, given that this is an emergent research field. The study of actual implementation must be built upon solid research results that show the benefits and possible drawbacks of integrating MMORPGs into L2 education. My study provides a number of implications for implementing MMORPGs for second language learning. But the implementation of MMORPGs requires more than researchers' efforts alone. Further researchers can investigate this field through collaborations with practitioners, game designers, students, and/or computer science engineers for broader perspectives.

Research on tests and measurements targeting the use of MMORPGs for L2 education is missing in the existing literature. Researchers could use the model I created

in this study as a starting point for further investigation. Variables concerning different aspects of learners' differences could be incorporated into the model.

Limitations

There are several limitations of this research that require attention for further investigation. The first important limitation is the unspecified response rate in the first, quantitative phase of the study. In survey research, response rate is considered the most widely used indicator for determining the quality of surveys (Biemer & Lyberg, 2003). Researchers use a variety of strategies to achieve an acceptable response rate. My study adopted a new method of web-based survey research with the purpose of reaching a very large audience that is representative of the target population (Cook, Heath & Tompson, 2000) in a more economic and expedient way (Ilieva et al., 2002). I posted the survey links on public websites where those who visit and meet the sample criteria are invited to respond, meaning that I could not collect any information to calculate the response rate (Cook, Heath & Tompson, 2000). Although web-based survey methods enjoy considerable benefits, empirical studies on the response rates and quality of web-based surveys are still limited (Deustkens, 2004). To enhance the potential response rate, I used a variety of measures identified in the existing literature. For example, since evidence shows that the number of personalized contacts and pre-contacts is the most important factor leading to a higher response rate (Cook, Heath & Tompson, 2000), two months before the online recruitment for the survey, I created topics relevant to learning English by playing MMORPGs and actively interacted with people who responded to my posts. Then, during the recruitment stage, I sent private messages to these contracts, inviting

them to complete the survey and encouraging them to spread the survey link to other target populations. In addition, I used monetary incentives to increase the response rate (Church, 1993; Dillman, 2000) by using lotteries, which is considered the most effective type of incentive in terms of leading to the highest response rate (Deustkens, 2004). According to an academic review on survey response rate (Johnson & Owens, 2003), most of the prominent journals widely use the expertise of peer reviewers to determine the quality of the study if it does not disclose the response rate. I conducted the peer review of my study by receiving feedback from my dissertation committee members to enhance the validity. Nevertheless, I acknowledge that a report of a full disclosure that includes a specific response rate is important for a more rigorous and reliable research study (Johnson & Owens, 2003).

A further limitation is that the study's reliance on self-reported data from the questionnaire and interviews might cause data bias. I employed the self-reported measurement of players' perceptions because it is both impractical and time-consuming to get the desired outcomes of respondents' perceptions through observations or testing (Gonyea, 2005). This means that interpreting the questions and the answers are only determined by the respondents (Pace, Barahona, & Kaplan, 1985), which may influence the data's credibility. To address this potential issue, I performed a factor analysis and internal consistency tests to ensure the validity and reliability of the self-reported data. By following Gonyea's (2005) suggestion, I also used follow-up interview data to triangulate the data sources rather than relying on the survey data alone. I used different measures to verify the interpretations of the qualitative data to make it consistent and identifiable

(Talja, 1999). For example, I used enough text extracts as linguistic evidence for my interpretations (Potter & Wetherell, 1987). I also disclosed details of each step in the data analysis procedure with justifications from existing literature. As with the survey data, interview data is interpreted data based on self-reporting, meaning it can be influenced by the participants' ability to remember and articulate the information-seeking situations (Talja, 1999). In future research, multiple data sources, such as observations, self-observations, and interviews, can be used in concert to increase the reliability of the findings (Talja, 1999).

The third limitation lies in the small number of female participants (41 out of 371) in the first, quantitative phase of the study. An unequal proportion of male and female MMORPG players might cause this remarkably uneven sample size. In contrast to a report in 2004 that 81% of online game players were male (Griffiths, Davies & Chappell, 2004), the 2016 Entertainment Software Association (ESA) report shows that the current percentage of female online game players has increased to 41% (Yee, 2017). Female gamers range from 2% to 69% depending upon the type of game (Yee, 2017). In terms of MMORPGs, the proportion of female players is on the rise, ranging from 16% to 36% depending on different games, which is higher than the 9% to 20% reported in 2006. It is clear that male players are still dominant in playing MMORPGs, meaning it is impossible to get equal sample sizes across the gender groups. It is suggested that researchers collect data from groups of roughly equal group size to maximize the power of the total sample size and reduce the inequality of variances across the two groups (Rusticus & Lovato, 2014). One option to address the issue for unequal sample size is to increase the total

sample size as much as possible to maximize the variance across different groups

(Rusticus & Lovato, 2014). For future research that addresses differences across groups,

the issues of variance as well as sample size should be considered at the planning stage.

Conclusion

This mixed-methods sequential explanatory study offered a preliminary view of

players' preference for using MMORPGs to gain L2 English vocabulary knowledge. In

the first, quantitative phase, I collected the quantitative data via a web-based survey.

Reliability and validity of the survey scale items were established using inter-item

correlations, factor analysis, and internal consistency reliability tests. I selected path

analysis for its depiction of the predictive utility of each variable in the structural model. I

formulated and tested three models to assess the hypotheses related to relationships

among variables. Path models showed strong model fit to the data, meaning they are

reliable and valid for understanding players' preference of MMORPGs for L2 English

learning. Results from the analysis support the prior research that learning opportunity is

an important user belief for predicting players' preference for using MMORPGs in the L2

English classroom.

Following the results derived from the quantitative study, I conducted in-depth

qualitative interviews with 11 purposefully selected participants to explain why certain

factors tested in the first phase were significant predictors that impact players' preference

to use MMORPGs to obtain L2 English vocabulary. Using a combination of thematic

analysis and directed content analysis, three themes emerged from the interview

transcript data. I utilized member checking with the participants, rich and transparent

descriptions of the analysis, and an academic adviser's assistance to verify the research procedures. Results from the analysis provided deep insight into how players experience and understand their learning process while playing MMORPGs. Stories of the players I interviewed described that meaningful learning occurs in MMORPGs. Evidence shows that a variety of learning opportunities provided by MMORPGs create an ideal L2 learning environment.

I integrated the results of the quantitative and qualitative phases of the discussion of the findings. I combine results from both phases to answer my research questions. First, I interpreted the predictive factor for players' preference to use MMORPGs for L2 English vocabulary learning. Then, under the guidance of the research questions in the qualitative phase of the study, I further investigated the statistical results. I connected findings derived from each phase of the study to the research questions by relating them to the existing literature, thereby examining the research results in light of the foundation provided by existing studies. This study contributes to the area of research from three perspectives. First, I created and validated an instrument that measures players' perceptions towards integrating MMORPGs into L2 English vocabulary learning, based on the existing model on students' acceptance for video games in the classroom (Bourgonjon et al., 2009). Second, I constructed a path model for depicting the causal relations among variables. Third, I conducted an in-depth exploration to understand how learning occurs during game-play from the perspective of MMORPGs players, with the purpose of providing implications for educators.

Overall, this study investigated the potential of using MMORPGs to facilitate ELLs' vocabulary acquisition by exploring players' perceptions and interpreting their learning experiences. It uncovered how and why learning process happens during the gaming activities, and illuminated ways of actual integration. In so doing, this study provided educators with implications that can be employed in their second language instructions.

APPENDICES

Appendix A

Survey Questions (Adapted from Bourgonjon et al., 2010)

Section 1 Demographic Information
1. Please provide an e-mail address where I can contact you. (*Your e-mail is for safekeeping data and contacting you and will not be shared.)
2. What is your gender?
3. What is your age?
4. Ethnicity origin (or Race): Please specify your ethnicity.
   A. White
   B. Hispanic or Latino
   C. Black or African American
   D. Native American or American Indian
   E. Asian/Pacific Islander
   F. Other
5. What is your first language?
6. What is the highest degree or level of school you have completed? *If currently enrolled, highest degree received.*
   A. No schooling completed
   B. Nursery school to 8th grade
   C. Some high school, no diploma
   D. High school graduate, diploma or the equivalent (for example: GED)
   E. Some college credit, no degree
   F. Trade/technical/vocational training
   G. Associate degree
   H. Bachelor's degree
   I. Master's degree
   J. Professional degree
   K. Doctorate degree

Section 2 Question Items

7. When did you first start playing MMORPGs?
8. What MMORPGs are you playing? Which one(s) is/are your favorite?
9. What got you interested in playing MMORPGs?
10. On average, how many hours do you play World of Warcraft weekly?
    A. 1-3 hours per week
    B. 4-7hours per week
    C. 8-11 hours per week
    D. 12-15 hours per week

E.   16-20 hours per week

F.   More than 20 hours (Please specify):

11. I like playing MMORPGs.
    A. Strongly agree
    B. Agree
    C. Somewhat agree
    D. Somewhat disagree
    E. Disagree
    F. Strongly disagree

12. Compared to people of my age, I play a lot of MMORPGs.
    A. Strongly agree
    B.   Agree
    C. Somewhat agree
    D. Somewhat disagree
    E. Disagree
    F. Strongly disagree

13. I would describe myself as a gamer of MMORPGs.
    A. Strongly agree
    B. Agree
    C. Somewhat agree
    D. Somewhat disagree
    E. Disagree
    F. Strongly disagree

14. I play different MMORPGs.
    A. Strongly agree
    B. Agree
    C. Somewhat agree
    D. Somewhat disagree
    E. Disagree
    F. Strongly disagree

15. I have acquired English vocabulary by playing MMORPGs.
    A. Strongly agree
    B. Agree
    C. Somewhat agree
    D. Somewhat disagree
    E. Disagree
    F. Strongly disagree

16. I can acquire English vocabulary in an efficient way by playing MMORPGs.
    A. Strongly agree
    B. Agree
    C. Somewhat agree
    D. Somewhat disagree
    E. Disagree
    F. Strongly disagree

17. I know how to use the vocabulary I acquired from MMORPGs.
    A. Strong agree
    B. Agree
    C. Somewhat agree
    D. Somewhat disagree
    E. Disagree
    F. Strongly disagree
18. I know how to use MMORPGs acquire English vocabulary.
    A. Strongly agree
    B. Agree
    C. Somewhat agree
    D. Somewhat disagree
    E. Disagree
    F. Strongly disagree
19. It would be easy for me to use MMORPGs to acquire English vocabulary.
    A. Strongly agree
    B. Agree
    C. Somewhat agree
    D. Somewhat disagree
    E. Disagree
    F. Strongly disagree
20. My interactions with non-player characters and other players are easy and
    understandable.
    A. Strongly agree
    B. Agree
    C. Somewhat agree
    D. Somewhat disagree
    E. Disagree
    F. Strongly disagree
21. MMORPGs offers opportunities to experiment with English vocabulary.
    A. Strongly agree
    B. Agree
    C. Somewhat agree
    D. Somewhat disagree
    E. Disagree
    F. Strongly disagree
22. MMORPGs offer me opportunities to take control over the vocabulary learning
    process.
    A. Strongly agree
    B. Agree
    C. Somewhat agree
    D. Somewhat disagree
    E. Disagree
    F. Strongly disagree

23. MMORPGs offer opportunities to interact with other players and acquire English vocabulary.
    A. Strongly agree
    B. Agree
    C. Somewhat agree
    D. Somewhat disagree
    E. Disagree
    F. Strongly disagree
24. MMORPGs motivate me to acquire English vocabulary.
    A. Strongly agree
    B. Agree
    C. Somewhat agree
    D. Somewhat disagree
    E. Disagree
    F. Strongly disagree
25. MMORPGs offer opportunities to transfer the vocabulary knowledge between the game and real world.
    A. Strongly agree
    B. Agree
    C. Somewhat agree
    D. Somewhat disagree
    E. Disagree
    F. Strongly disagree
26. If I had the choice, I would choose to follow courses in which MMORPGs is used.
    A. Strongly agree
    B. Agree
    C. Somewhat agree
    D. Somewhat disagree
    E. Disagree
    F. Strongly disagree
27. I am enthusiastic about using MMORPGs in the English classrooms.
    A. Strongly agree
    B. Agree
    C. Somewhat agree
    D. Somewhat disagree
    E. Disagree
    F. Strongly disagree
28. Compared to traditional classroom instructions, I prefer to integrate MMORPGs into the vocabulary instruction.
    A. Strongly agree
    B. Agree
    C. Somewhat agree
    D. Somewhat disagree
    E. Disagree

F. Strongly disagree

Section 3 Additional Questions

29. What is/are the major source(s) from which you acquire English vocabulary by playing MMORPGs?
    A. Reading the game quests/storylines
    B. In-game chatting with other players
    C. Reading/posting on the game-related forums.
    D. Others (Please specify)
30. (Optional)What you think are feasible ways to integrate MMORPGs into English (esp. vocabulary) instruction?
31. (Optional) If using MMORPGs are not feasible to be used in classrooms, what other ways do you think we can use them for learning purposes?
32. (Optional) Is there anything we haven't asked on this form that you think we should have?
33. Would you be willing to participate in follow-up interviews? If yes, please provide the best day/time for me to contact you. The interview will take 1 hour or less.

Note: Short answer questions are used to identify information-rich participants for the follow-up interviews.

Appendix B

Interview Protocol

1. Can you tell me a little about your family, and your upbringing and your current life?

2. What is your first language?

3. How many years have you been learning English?

4. Can you describe all of the ways that you believe you have learned English in the past, and ways you are currently learning English?

5. When did you begin to play MMORPGs?
6. What made you play it?

7. What MMORPGs have you been playing? Which one is your favorite? Why?

8. What do you do when you encounter a word you don't understand when you play MMORPGs?
9. In your opinion, why does playing MMORPGs allow players to learn vocabulary learning?
10. Which are your major sources of gaining English vocabulary by playing MMORPGs, e.g. reading the game quests and storylines, chatting with other participants, visiting game-related online forums, making friends with other players in the real life, and etc.?
11. Can you give me examples to detail why and how you can learn English vocabulary through these activities?
12. Can you tell us about your experiences when learning English vocabulary at school? 12.
13. Do you like it? Why or why not?
14. Compared with traditional ways of learning English at school, would you prefer to learn English vocabulary by taking a course that integrates MMORPGs? Why or why not?
15. What do you imagine would happen in the classroom if MMORPGs was integrated into instruction?
16. If MMORPGs were used for the purpose of learning English vocabulary, would you know how to use it in that way? Please detail your answer by giving examples. Is it easy for you to learn English in this way?

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