World of Warcraft as a Medium for Intermediate-Level English Language Acquisition: Leveling up Accuracy, Fluency, and Lexical Complexity

by

Ross Zariski
Bachelor of Arts, University of Victoria, 2010

A Thesis Submitted in Partial Fulfillment
of the Requirements for the Degree of

MASTER OF ARTS

in the Department of Linguistics

Supervisory Committee

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Abstract

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In recent years, video games have exploded in popularity and the sales of many popular video games now rival Hollywood blockbusters for revenue. While traditionally used as a medium for entertainment, researchers have also recently begun to explore their potential as learning resources. Many educational games have been created in an attempt to combine entertainment with education, but very little research has been done exploring the potential benefits that commercial online video games can have on language learning. This descriptive study is designed to examine whether or not an off-the-shelf (OTS) Massively Multiplayer Online Game (MMOG) - World of Warcraft, can act as a medium for language acquisition. Specifically, it examines whether intermediate-level English language learners' written accuracy, fluency, and lexical complexity can increase through its play, and what the participants' perceptions of using an MMOG as a language learning resource are. Participants consisted of four intermediate-level adult English language learners and four English as first language (EL1) speakers. Each English language learner was randomly paired with an EL1 speaker and played the MMOG World of Warcraft over a span of four weeks. The participants' chat transcripts, along with semi-structured questionnaires, and interviews, were used to gather in-depth data from the participants. The participants' chat logs were analyzed for improvement in the areas of accuracy, fluency, and lexical complexity by comparing the first and last 25% of their exchanges with the EL1 speakers. Two of the four participants showed some improvement in all three areas

that were analyzed, while the remaining two participants showed some improvement in one or two of the three language areas. Results from the questionnaires and interviews indicated that all of the participants felt that playing the game with the EL1 speaker contributed positively to their English language skills and provided a positive learning environment. These results contribute to the growing body of research on MMOGs and give credence to the argument that video games do not have to be solely considered as a source of entertainment, but that they can also be useful as pedagogical tools.

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Acknowledgements

This thesis could not have been written without the help and support of a number of people. I would like to express my sincere gratitude to everyone who has helped me on this journey. I could not have done it without you.

I would first like to thank my supervisor Dr. Hossein Nassaji for all of his help, support, advice, and guidance during my entire time as an MA student and throughout this thesis. In addition, working as an RA under him allowed me to gain valuable research experience and also provided financial support.

I also want to thank Dr. Li-Shih Huang for her interest in this project, her helpful comments, and for agreeing to be on my committee. It was her initial interest and her enthusiasm for this project that prompted me to pursue this research.

I would also like to thank everyone at the ELC for allowing me to recruit some of your students as participants. I would especially like to thank Robbie and Gerry for inviting me to their classes. A big thank-you also goes to all of my participants for agreeing to be a part of this research. Without their involvement, this study would not have been possible.

Next, I would like to thank my wife, Leah, and my parents for all of their unwavering support, motivation, and understanding. Whenever I felt discouraged, they always found a way to keep me motivated.

Finally, I would like to thank the entire Department of Linguistics at the University of Victoria for their financial and academic support throughout my MA program.

Chapter One – Introduction

1.1 Background

In recent years video games, whether played on a phone, tablet, computer, or gaming system, have exploded in popularity. These days, sales of popular video games like the Call of Duty franchise now rival, and in some cases even surpass, major Hollywood blockbusters like the Harry Potter series for global sales (Goldberg, 2012). In fact, according to recent box office statistics, the newest title in the Call of Duty franchise (Call of Duty: Black Ops 2) earned more than $500 million in its opening night (Goldberg, 2012). By comparing this figure with the top-grossing movie in a 24-hour period - Harry Potter and the Deathly Hallows 2, a significant trend can be seen. Harry Potter and the Deathly Hallows 2 earned just over $91 million in a 24-hour period (Top Single Day Grosses, 2012; Biggest Single Days, 2012). This trend is not isolated to one particular geographical area or demographic group, but is seeing a surge of popularity across all countries, age groups, and genders. More and more, individuals are now using video games as both an extracurricular activity and as a means of social networking and communicating with friends (Selfe, Mareck, & Gardiner, 2007; Sylven & Lundqvist, 2012). In these online environments, players with various backgrounds and L1s (first languages) from all over the world are required to communicate successfully with each other if they are to succeed in their respective games. This situation often involves one or more individuals learning and using a language other than their L1.

The idea of using computer programs or video games as a tool for language learning is not new; however, it was only recently that Computer Assisted Language Learning (CALL) began to gain traction (Adair-Hauck, Willingham-McLain, & Youngs, 2000). Recently, CALL has become an important aspect of linguistic research and many journals are now dedicated to

publishing literature pertaining solely to CALL topics such as: *Language Learning & Technology*, *CALL*, *RECALL*, *Simulation and Gaming,* and *Computer Assisted Language Learning*. Many studies published in these journals point to the successful use and implementation of computer programs in assisting learners with language acquisition. There are, however, a significant number of differences between a game designed for educational purposes like teaching basic vocabulary or grammatical structures, such as the ViVo program employed for vocabulary learning in Weimer-Stuckmann (2009), and a video game designed for mass consumption and appeal like the Call of Duty series. The question of whether these off-the-shelf (OTS), online video games can promote language learning, provide practice, or assist in the acquisition of particular language features, is an area that is still in its infancy and requires further research.

The purpose of the current study is to expand upon the existing CALL research on video games as a language-learning tool to include commercial OTS and massively multiplayer online games (MMOGs). Building on previous research that has shown a positive correlation between playing video games and language learning, the present study contributes to the growing body of CALL research by examining specifically how play of a commercial OTS MMOG can contribute to the improvement of a language learner's written fluency, accuracy, and lexical complexity, and to gather information on the learners' perceptions towards using an OTS MMOG as a tool for language acquisition.

1.2 Outline

This thesis is organized into five remaining chapters. Chapter two includes a review and analysis of the various Second Language Acquisition (SLA) theories that support the use of

video games as a tool for language learning, a look at specific aspects of how video games have the potential to create an ideal learning environment, and a discussion of a number of recent studies that have been conducted by researchers involving the use of video games as a method for second language learning. Chapter three outlines the research methods, which includes the participants, data collection, and the instruments used to collect the data. Chapter four presents the data analysis and the results of the data analysis. Chapter five provides a discussion of the research findings, outlines the implications and limitations of the present study, and explores potential research directions that stem from this study.

Chapter Two – Literature Review

2.1 Introduction

This chapter presents a review of the research that has been conducted on using video games as a language learning tool. It provides an overview of the theories that lend their support to the use of video games as a learning resource and also reviews a number of studies that have been conducted in this area and that examine the pedagogical role that video games can play. Research on the role that video games can play has been garnering more attention, and researchers have begun analyzing their use as learning tools. However, this field is relatively new, as the technology used to create a truly immersive learning environment has only recently been developed.

This chapter is divided into six main sections. Section 2.2 examines the pedagogical benefits that have been attributed to video games by researchers. Section 2.3 examines the theoretical background that supports the use of video games as learning tools including: Vygotsky's Sociocultural Theory and Krashen's Input and Affective Filter Hypotheses. Section 2.4 reviews a number of recent studies that have used video games as educational tools. This section includes studies that have used both single player video games and multiplayer video games. Section 2.5 provides a summary of the literature review and introduces the unresolved issues that exist in this research area, and finally, section 2.7 introduces the research questions.

2.2 Video Games and Learning

The use of video games as a learning instrument is a controversial topic. There is some debate as to its efficacy as a tool for education and, more specifically, for language acquisition.

It is from my experience that more traditional instructors tend to regard the use of video games as a distraction from important assignments, study, and homework, while other instructors and some researchers see video games as a useful learning device and point to their potential benefit on learner motivation, reduction in anxiety, and socialization as proof of their usefulness.

From a pedagogical perspective, the potential for OTS video games to aid in the development of language acquisition is a relatively new, albeit controversial, phenomenon that is supported by a number of theories and studies that have been conducted in the fields of both education and applied linguistics. Research has shown that video games can facilitate learning in a number of ways including: providing a significant amount of motivation, teaching problem solving techniques, defining clear goals, providing significant amounts of instant feedback, allowing learning through experience, eliminating the need for tests, and reducing anxiety (Baltra, 1990; Gee, 2011, as cited in Barseghian, 2011; Gee, 2007; Prensky, 2001; Ranalli, 2008). These reported benefits of video games on learning provide us with some clear advantages that video games may have over more traditional and conventional teaching and learning methods. In fact, a recent survey of the literature showed that of 40 studies that looked at the potential benefits of video games on learning, 29 of the 40 had positive outcomes (Backlund & Hendrix, 2013).

It seems that playing any type of video game may provide significant motivation and have a potential benefit on the player's ability to learn, but how does this relate to language learning? It would appear that language learning seems to be better facilitated through play of online games, where player interaction and communication are encouraged or, in some cases, essential to advance further in the game (Deutschmann, Panichi, & Molka-Danielsen, 2009;

Peterson, 2010, 2012; Rama, Black, van Es, & Warschauer, 2012; Ranalli, 2008; Suh, Kim, & Kim 2010; Sylvén & Sundqvist, 2012).

2.2.1 Massively Multiplayer Online Games

Video games have existed in one form or another for many years. Massively Multiplayer Online Games or MMOGs, as they are more commonly known, are a more recent genre of video games, which have, in recent years, exploded in popularity and now encompass a wide variety of sub-genres and franchises within their own category. MMOGs have become so popular in fact, that many major fantasy and science fiction franchises (such as Star Wars and Warhammer, to name a few) have their own games for fans to play. Unlike the traditional and stereotypical idea of video games, where a player purchases a game and plays it by him or herself (like Super Mario, for example), MMOGS are played exclusively online and simultaneously with other players. This means that, at any given time in the game, the user has the potential to interact with thousands of other real players that are playing the same game with their characters in the same world as they are.

MMOGs vary greatly in their business structure. They can have a one-time purchase cost and subsequently be free to play, be free to download and free to play but allow players to purchase more powerful in-game items, or they may require monthly subscriptions. Most of the games consist of the player creating an in-game character, or avatar, and then controlling them as they proceed to complete quests, explore the in-game world, meet friends, and often battle enemies. As the player progresses in the game they often "level-up," where their character becomes stronger, gains new abilities and is then often able to proceed to new or more difficult areas of the game.

What distinguishes MMOGs from other single-player games is the requirement that they are played online via an active Internet connection and most often require the assistance of other players in order to progress in the game. For example, in order to complete a quest, it might be required that a particularly difficult monster is defeated. The monster might be programmed to be too difficult for a single player to defeat, and the game encourages the user to form a party in order to defeat the monster together as a team. The experience for defeating the monster is shared amongst all members of the party, and each player is rewarded with the item. This game mechanic encourages cooperation and socialization amongst the players and often results in groups of players forming guilds, which are communities of players that frequently socialize and play the game together.

Advances in technology including the advent of high-speed Internet and powerful graphics cards have allowed these virtual worlds to evolve into the immersive and popular online games that are currently available. World of Warcraft, which is perhaps the best-known and currently the most popular MMOG, was created in 2004 and currently boasts over 10 million subscribers from countries all over the world (Karmali, 2012).

2.3 Theoretical Background

Along with creating an immersive environment and an enjoyable experience for the player, MMOGs have the potential to create an ideal environment for language learning. It is a safe assumption that most of the players, who are actively playing an MMOG, are there because they all share an interest in the game or genre and enjoy it. Gee (2004) describes the gathering of people with shared interests as an affinity space, which he describes as possessing "shared interest, distributed knowledge, non-discriminatory affiliations between players (of different skill

levels, linguistic background, races, gender, and socioeconomic status), and multiple routes for meaningful participation" (Rama et al., 2012, p. 325). These affinity spaces provide the perfect environment to facilitate language learning, by creating a space where novice players (or experienced players who may be using a language other than their L1 can participate in dialogues with other more experienced players (or L1 speakers) and can then use and expand upon their knowledge in a collaborative environment.

Theoretically, support for the use of video games as language-learning resources stems from a number of Second Language Acquisition (SLA) theories. The three theories that provide the most support to this idea are Vygotsky's Sociocultural Theory, Krashen's Input Hypothesis, and Krashen's Affective-Filter Hypothesis, each of which are briefly reviewed below.

2.3.1 Vygotsky's Sociocultural Theory

At a basic level, Vygotsky's Sociocultural Theory defines second language acquisition as learning that is assisted through social interaction (Atkinson, 2002 as cited in Peterson, 2012; Nassaji & Swain, 2000; Nassaji & Cumming, 2000; Vygotsky, 1978, 1986). That is to say, a key component of the Sociocultural Theory is the idea that "knowledge is social in nature, and is constructed through a process of collaboration, interaction, and communication among learners in social settings" (Nassaji & Swain, 2000, p. 35). In language acquisition, Sociocultural Theory emphasizes the roles played by social interaction and communication, collaboration between lower and higher level learners, the use of scaffolding, mediation, and zones of proximal development (ZPD) in language acquisition (Atkinson, 2002; Nassaji & Cumming, 2000; Nassaji & Swain, 2000; Peterson, 2012; Thorne et al. 2009; Vygotsky, 1978, 1986).

According to Vygotsky, ZPD refers to the difference between what an individual is capable of without assistance and their potential with the assistance of, or interaction with, more knowledgeable peers (Vygotsky, 1978).

Scaffolding is the process by which the novice, or less knowledgeable partner, interacts with the expert, or more knowledgeable partner. The scaffolding occurs where the more knowledgeable partner can create an environment where the novice can use and expand upon their knowledge in a collaborative and social interaction (Nassaji & Swain, 2000).

By creating and fostering a collaborative, interactive, and social environment for the players, where there is a necessity to communicate and cooperate with more knowledgeable peers, and one where scaffolding occurs as novice players and language learners are able to interact with, and learn from, more experienced players and L1 speakers, the use of an MMOG, like World of Warcraft, seems to possess the attributes that are at the core of the Sociocultural Theory. With World of Warcraft alone boasting over 10 million subscribers across the globe, interaction with individuals, who do not share an L1, or who are from a different country, seems inevitable. In addition to the sheer number of players, in MMOGs, there is a requirement to communicate and coordinate with others in order to accomplish in-game goals or complete quests. It is also possible to create guilds, which are comprised of players of various levels and backgrounds who often play together in order to help each other.

The aspects of an MMOG described above, have the ability to create the type of environment and provide the proper conditions for language learning that Vygotsky outlines in the Sociocultural Theory. These aspects can create a social, interactive setting with individuals of varying proficiency. They can create ZPD and allow scaffolding to occur by allowing newer

players to watch and learn from more experienced ones, eventually allowing them to use that knowledge for themselves.

2.3.2 Krashen's Input Hypothesis

Krashen's theory of Input Hypothesis also seems to support the idea of language learning through play of an MMOG. The Input Hypothesis, according to Krashen is the theory that language acquisition will occur in an environment where there is comprehensible input and where learners have access to language that is slightly more advanced than their current level. Krashen refers to this as "i+1," with the 'i' referring to the language input and the +1 as the next stage (Krashen, 1991, 1994, 1996, 2004; Mason & Krashen, 1997).

In an MMOG - like World of Warcraft, the types of input that a learner experiences can be both comprehensive and varied. Computer characters communicate with the player via both audio and text, quests are read, and other players communicate with each other and to the learner. The opportunity for comprehensible input is almost assured. As the game is also a collaborative environment, if the learner comes across an unfamiliar phrase or vocabulary, he or she can simply ask for assistance or clarification from any of the other players.

2.3.3 Krashen's Affective Filter Hypothesis

Another hypothesis of Krashen's Theory of Second Language Acquisition that seems to support language learning through playing video games is his Affective Filter Hypothesis. The idea is that there are a number of variables that can influence the success of a language learner. These variables include motivation, anxiety, and self-confidence (Krashen, 1981). If a learner has a high level of anxiety, for example, it has the potential to create a higher affective filter, and would therefore negatively impact the success of the learner.

MMOGs, like all types of video games can also create a high amount of motivation, a low anxiety environment; plenty of input opportunities, extensive feedback, challenges and goals, as well as creating an environment that promotes socialization (Barseghian, 2011; Peterson, 2010; Rama et al., 2012; Suh et al., 2010).

It is from these theories that the idea of learning a language, or at least facilitating the learning process, through MMOG play has stemmed.

2.4 Previous Studies on Video Games as a Language Learning Tool

A number of studies that have examined some of these theories in relation to video games and language learning are discussed in the following sections.

2.4.1 Single-player Studies

Sylvén and Lundqvist (2012) conducted a study exploring the various extramural English activities and habits that Swedish children aged 11-12 employed. In the study, 86 grade 5 students were recruited from six different classes at four schools (Sylvén & Lundqvist, 2012). The students were required to answer an initial questionnaire and keep a weekly language diary describing their use of seven different extramural English activities including: "reading books, reading newspapers/magazines, watching TV, watching films, using the Internet, playing digital games, and listening to music" (p. 308). A pre-test, post-test design was used, and the researchers designed a vocabulary test based on the most frequent English words at the 1,000 and 2,000 level (Sylvén & Lundqvist, 2012).

Once the study was completed and the data analyzed, it was found that of the seven activities, playing video games was the most popular among the students with a mean of 2.6

hours/week (Sylvén & Lundqvist, 2012). Within the participants who were classified as gamers, three groups were created based on the amount of time that they played each week: non-gamers, moderate gamers, and frequent gamers. Non-gamers played zero hours of video games per week, moderate gamers played between zero and five hours per week, and frequent gamers played more than five hours a week (Sylvén & Lundqvist, 2012). The results showed that the gamers outscored the non-gamers in all parts of the vocabulary test, reading comprehension, and listening comprehension, and that the frequent gamers outscored the moderate gamers. Sylvén and Lundqvist concluded their analysis with the statement "the results highlight what seems to be a trend, namely that there is a positive correlation between L2 proficiency and how much time is spent on playing digital games" (p. 314).

There are some problems with their methodology. Sylvén and Lundqvist acknowledged in their study that certain types of video games would seem to afford the learner more interactional opportunities than others. That is, games like the Sims, which are played solely by one user, would seem less likely to provide the various communicative opportunities than an online and collaborative game like World of Warcraft. In their analysis, Sylvén and Lundqvist did not differentiate between the types of games that were being played and their respective test score results. Rather, they simply provided a general analysis of gamers versus non-gamers. Another potential downfall of their methodology is the use of the top 1,000 and 2,000 English words in the vocabulary tests. Many of the vocabulary items learned in games, especially single player games, are very context specific, and it would seem very problematic to test and then measure success on vocabulary items that were not used in any sort of treatment. A game like The Sims makes heavy use of everyday vocabulary such as furniture, clothing, and household

items, but games in the science fiction or fantasy genre often extensively use niche vocabulary terms such as dragons, lasers, battle-axe, and so on.

Another study that looked at the efficacy of using single-player games as a language learning resource is a 2008 study by Ranalli. He attempted to replicate an earlier study conducted by Miller and Heigelheimer (2006), which examined the efficacy of using a commercial OTS video game, in this case the popular game The Sims, to improve the vocabulary of English as a second language (ESL) students with the addition of supplementary materials and structured gameplay. Ranalli expands upon Miller and Heigelheimer (2006), by also analyzing the learners' perceptions to using the game as a learning tool, and employing a longer survey instrument. The goal of Ranalli's study was to see what the participants' perceptions on using the game to learn were and if the game, with the addition of supplemental materials, could be successfully used for vocabulary learning.

Participants consisted of nine university-age intermediate ESL students from a variety of backgrounds, and were recruited from an American university (Ranalli, 2008). The participants were organized into three different groups, high, medium, and low, and were then divided into pairs.

The commercial OTS game The Sims was used. The Sims is a simulation-type game where the player creates and controls one or more human characters and guides them through their everyday life. The player is required to maintain their character(s)' necessities, including food, emotional relationships, finding a job, and purchasing and furnishing a house. As noted earlier, throughout the game, the player is exposed to a significant amount of written language including in-game instructions, menu text, and in-game vocabulary.

Supplementary material was also used, as previously noted. The supplementary materials for the study consisted of a website that offered a variety of information, including vocabulary information, quizzes, culture notes, a link to an online dictionary, and gameplay instructions (Ranalli, 2008). This website was made available to the participants via a computer placed beside the gaming computer. The participants played the game in dyads and alternated between playing the game and assisting the player with the supplemental materials. Thirty vocabulary words were chosen from the game's lexicon and a pre- and post-test design was implemented in order to test the participants' knowledge of the 30 words prior to the study and following its completion (Ranalli, 2008). Once the participants had finished playing the game, they filled out a survey that collected information on their perceptions and opinions of using the game as a learning resource.

After analyzing the results, the authors reported that the participants found the game to be enjoyable and that they would play the game again. Participants also agreed that the game could be useful for learning. The results from the pre- and post-tests showed that playing the game with the supplemental materials contributed to vocabulary acquisition. According to his statistical analysis, participants who played at station 1, which contained all supplemental material had a mean score of 8.56 (Ranalli, 2008). Station 2, which contained optional culture notes and access to an online dictionary, had a mean score of 5.78 (Ranalli, 2008). Finally, station three, which contained instructions, only had a mean score of 6.89 (Ranalli, 2008). The results also showed that the participants generally held a positive view towards the supplementary material and found them to be helpful throughout the study (Ranalli, 2008).

While Ranalli's study points to the potential benefits from the game on vocabulary acquisition by the learners and was reported to be an enjoyable experience, Ranalli notes that the

possible limitations of his study include a small sample size and that some of the data were self-reported. Another interesting result of his study was the mean scores from the stations. Station 1, which included all of the supplemental material scored the highest, but station 3, which only had instructions, scored higher than station 2. These results raise questions as to the efficacy of the supplemental material, or their use by the participants.

Chen and Yang (2013) conducted another study that points to the beneficial link between playing single player video games and language acquisition. In their study, the researchers explored the potential benefits that playing a single-player adventure game could have on language learning. More specifically, the researchers examined whether or not playing a single-player adventure game could contribute to vocabulary acquisition in a foreign language learning environment, as well as reporting on what perceptions the participants held of utilizing the game for language learning purposes.

The study by Chen and Yang (2013) uses another commercial OTS video game, rather than a specially designed CALL game. In their study, the commercial adventure game Bone, which consists of two episodes, was used. Bone is an adventure game where the player assumes the role of a character in a story, and gameplay involves exploration and puzzle solving.

The researchers conducted two studies to examine the potential benefit that the game could have on language learning. In the first study, a pre- and post-test design was employed and 22 college students in Taiwan were recruited to play the game (Chen & Yang, 2013). The participants were divided into two groups, with one group being allowed to take notes on new and unknown vocabulary, while the other group was not permitted to take notes, but simply play the game. Once the participants had played 1.5 hours of the game, they were given a post-test

that tested them on 20 specific in-game vocabulary items (Chen & Yang, 2013). Testing consisted of the participants writing the Chinese translations of the specific English vocabulary. The differences between the scores of the pre-test and the post-test were then calculated in order to judge any improvement.

The results of the first study showed that there was no significant difference between the note-taking group and the non-note-taking group. The authors reported that the results also showed that participants performed better on the post-test than on the pre-test, which showed that playing the game did have a beneficial impact on the learners (Chen & Yang, 2013).

In the second study, the researchers aimed to gather data on the participants' perceptions of using an adventure game in an English as a Foreign Language (EFL) setting for language learning (Chen & Yang, 2013). Thirty-five college students at the intermediate English level were recruited to participate. The participants were required to complete both episodes of Bone in a 16-week timeframe. Following the 16 weeks, the participants were asked to complete a short report about their experience and answer a post-game questionnaire (Chen & Yang, 2013).

The results gathered from the report showed that the participants felt that the game was helpful to a range of English skills including their "general English ability, listening ability, reading ability, and vocabulary knowledge" (Chen & Yang, 2013, p. 135). Participants also reported that the game environment improved learning attitudes by providing motivation to learn, providing an all-English environment, and a sense of accomplishment (Chen & Yang, 2013).

Despite receiving positive results on a number of different indicators, the authors cited a number of limitations in their design and some potential problems for using video games as a

method for language learning. The researchers mentioned that they had a relatively small sample size to gather data from, that the duration of gameplay may have been too short, and that the highly interactive nature of the game itself may have had a negative impact on the language acquisition of the participants. An interesting issue that the authors introduced was the idea that the language level of the learner must be appropriate to the language of the game. That is to say, that if the language level of the learner is too low, the vocabulary and instructions of the game will be too difficult to understand, and may serve to undermine the purported low-anxiety environment that the games are supposed to create.

With the exception of Sylvén and Lundqvist (2012), who did not specify which games their participants played, the above studies were all conducted using a commercial, single-player OTS video game. The results gathered from Sylvén and Lundqvist (2012), Ranalli (2008) and Chen and Yang (2013) all suggest a positive correlation between language learning and gameplay. All three studies show evidence for a positive correlation between vocabulary acquisition and video game play, and both studies by Ranalli (2008) and Chen and Yang (2013) show that video games can contribute to a positive learning environment by providing motivation and an enjoyable atmosphere.

2.4.2 MMOG Studies

Suh et al. (2010) conducted their study on 220 elementary English learners in Korea who used a specially designed massively multiplayer online game (MMOG) as a comparison to a face-to-face classroom. This study was designed in order to see if learning English through an MMOG was effective. After taking a pre-test to determine their language levels, the students played an English MMOG but received the instructions on what to do in Korean due to their low

language level (Suh et al., 2010). The students completed a number of tasks including item gathering and monster hunting, as well as answering English language questions in which they were required to work and communicate together in order to successfully complete (Suh et al., 2010). The results of their study are very interesting. After a post-test, it was found that students who studied English using the MMOG performed better than their peers in the face-to-face classroom in listening, writing, and reading. These results were determined by five separate tests including: an English language proficiency test, a motivation test, a self-directed skill test, a computer use ability test, a game skill test, as well as a survey.

There are, however, a number of potential problems with this analysis. The results of their study contributed to the idea that using computer games can facilitate language learning, but there are a number of points that should be made. The online computer game that the students used was specially designed to be educational but fun, and specific vocabulary items and grammar structures could be used in the game and then tested. The study by Suh et al. (2010) provided evidence to support the idea that MMOGs contribute to language learning, but their study cannot answer the question of whether or not an OTS, commercial game can contribute in the same manner.

Another study to examine the effectiveness of using an MMOG for second language acquisition was conducted by Peterson in 2012. Peterson conducted a study that involved four intermediate level EFL learners in Japan. The ages of the participants ranged from 23 to 25 years old, and the participants all had experience using computers, but none of them had played an English MMOG before (Peterson, 2012). The learners played the MMOG Wonderland over the course of the semester (four months) and, during this time, he collected data on their experiences (Peterson 2012).

Like many MMOGs, the gameplay of Wonderland consists of a variety of quests that players are required to complete in order to gain items and levels. Players are also able to join guilds, which grant them even more opportunities to communicate and play with others. In his study, Peterson used screen capture software in order to save the participants' interactions with other players and gathered information from pre- and post-study interviews (Peterson, 2012).

The results of Peterson's study provide some insight into the relationship between language learning and MMOG play. Peterson's analysis of the data attained through self-reporting by the participants, found that the participants felt that the text and avatar based interface of the game led to a low level of anxiety that facilitated communication (Peterson, 2012). Interviews were conducted in which participants expressed their feelings on their experience. From these interviews it was noted that the learners felt they experienced numerous opportunities to expand their reading and vocabulary skills, and gained insight into a different the "digital vernacular" variety of English (Peterson, 2012, p. 378). Peterson notes that, overall, the learners expressed positive attitudes towards using the game as a method to improve their English ability (Peterson, 2012).

There are some potential limitations that Peterson admits resulted from his study. He described much of the communicative interaction that took place as a type of "digital vernacular" that may cause some problems for learners who adopt the ungrammatical or misspelled phrases, which are commonly used by L1 speakers during gameplay (Peterson, 2010, p. 378). He also warns against the generalization of the results of his study as the results were self-reported by the learners rather than their performance being measured using pre- and post-tests that could definitively show the learners' improvements (Peterson, 2012). While Peterson's study is a great reference as it describes the use of an OTS MMOG to facilitate language learning, it could be

argued that the instruments used to measure learner improvement may not be completely reliable, and this is why Peterson warns against generalizations.

Rama et al. (2012) conducted a similar study to Peterson (2010), except they opted to use a Spanish as a second language environment, rather than an English one. Using six participants, of varying levels of Spanish proficiency, and with varying experience playing World of Warcraft, they wanted to determine whether playing an MMOG had a positive impact on their communicative ability (Rama et al., 2012). In their article, Rama et al. report specifically on the experiences of two of their participants. One of the participants was a beginning Spanish learner male with experience playing World of Warcraft, and the other was an advanced Spanish learner female, without any experience playing World of Warcraft. Rama et al. defined and measured communicative ability as "the type[s] of utterances, length of pauses between utterances, the role that the participants played in exchanges, and the changes over time" that occurred during their interactions (p. 327). The study lasted for a seven-week period during which the participants were free to play as much as they wanted (Rama et al., 2012). Rather than utilizing a pre-test, post-test methodology, Rama et al. conducted a qualitative study, where they installed screen capture software that allowed them to record the text chat that the individuals used (Rama et al., 2012). Both participants also kept journals while playing, which chronicled their experiences regarding aspects of the game they enjoyed, found difficult or enjoyable as well as references to language use (Rama et al., 2012). Since they did not conduct the study with a pre- and post-test methodology, the results of the study were gathered through the analysis of participants' chat logs, the game journals they kept, as well as from the interviews that were conducted every two weeks. After reviewing the chat transcripts, journals, and interview data, they found that the game itself created a low anxiety environment and the beginner Spanish learner increased his

vocabulary range, conversational fluency (judged by the amount of interaction between others and the length of time between sending messages) and ability to maintain rapport with guild mates through this play (Rama et al., 2012). From her interviews and journal entries, it was found that the advanced Spanish learner, despite understanding the language of the game, admitted to having some confusion regarding game objectives, which caused her some problems, but she acknowledged that after playing, she was more likely to think in Spanish (Rama et al., 2012).

In the study by Rama et al. (2012), it appears that the beginner benefited more from playing the game, as he was already familiar with the mechanics and play style of the game World of Warcraft, which allowed him to focus solely on the language aspect of the study. With this caveat in mind, in order to successfully analyze the language aspect, it seems necessary to find a balance between player experience and language ability. If the participant has too great of a knowledge of the game, it may be possible for them to progress through the game by memory regardless of communication. On the other hand, if the participant is not familiar with the game or its interface, he or she may find it difficult to play, which would result in frustration and detract from the language emphasis of the study.

As mentioned earlier with Peterson's 2012 study, a potential downfall of learning a language through MMOG play is the type of language that is usually used by L1 speakers and potentially acquired by learners. In general, the type of vocabulary learned is quite colloquial and often times grammatically incorrect, as speed is favoured over accuracy. In these circumstances, it is important to make the distinction between a mistake and an error. According to Brown (2000), a mistake "refers to a performance error that is either a random guess or a "slip," in that it is a failure to utilize a known system correctly" (p. 217). On the other hand,

errors are "noticeable deviation[s] from the adult grammar of a native speaker" (p. 217). An error cannot be self-corrected as they arise out of the student's interlanguage and are produced from a lack of knowledge (Brown, 2000). Errors, however, do not have to solely refer to the grammaticality of an individual's utterance. Errors can also refer to "language forms that do not accord with either the rules or the norms of the target language" (Nassaji, in press, p. 4). In the present study, utterances that deviate from either the rules, or the norms, of the target language would therefore be considered as erroneous.

While exposing learners to grammatically incorrect utterances and abbreviations may seem problematic, it still assists in developing fluency and communicative competence. In Rama et al.'s study, the authors make a note that "even native speaker gamers use abbreviated and orthographically and stylistically non-standard language, in addition to simple typo-graphical errors" (p. 331). The mistakes are not because the players are unable to formulate grammatically correct sentences, but rather, during gameplay, speed is favoured over accuracy, and multiple activities are often happening simultaneously, which make constructing full grammatically correct sentences difficult. While this could be seen as a potential problem for anyone studying the acquisition of language during MMOG play, it could also be seen as positive. Rather than learning a textbook-style language, which is not often used in daily life, the learner is getting the opportunity to learn and experience the language being used in a natural conversational environment. As this particular field of CALL is still new, few studies have been conducted and published in this area, and the studies that have been published differ greatly in their methodology, participants, and analyses.

The three studies reviewed above were all conducted using an MMOG video game. Like the data gathered from the single player studies, the results gathered from Suh et al. (2012),

Peterson (2012), and Rama et al. (2012) all point to the potential positive benefit that may exist between language learning and gameplay. All three of these studies show evidence for a positive correlation between vocabulary acquisition and video game play, and the two studies by Peterson (2012) and Rama et al. (2012) give evidence that playing an MMOG creates a low anxiety environment that facilitates communication, is enjoyable, and can increase the learner's conversational fluency.

2.5 Unresolved Issues and Purpose of the Present Study

The studies reviewed above all provide some evidence for the use of video games in general, and more specifically MMOGs, in facilitating language learning. Chen and Yang (2013), Peterson (2012), Rama et al. (2012), Ranalli (2008), Suh et al. (2010), and Sylvén and Sundqvist (2012) have all conducted research in this area, and their data suggested that video games in general and also online video games, show a potential benefit to language learning and a use as pedagogical tool. Despite this body of research, however, these studies are still very few in number and the vast majority of the studies that have been conducted by researchers have looked predominately at their ability to assist in vocabulary acquisition (Chen & Yang, 2013; Peterson, 2012; Ranalli, 2008; Sylvan & Lundqist 2012). Furthermore, many of the studies that have been conducted in this area have gathered and analyzed solely self-reported data and have tended to look at general language improvement from participants, learner motivation, or vocabulary acquisition. These studies have not examined the potential benefit of video games on specific aspects of language such as the accuracy of a learners' written language or their lexical complexity. Few studies have been conducted in this area that explore the potential benefit of video games on other non-vocabulary language attributes, such as the accuracy of a learner's language, and there have been no studies that I am aware of that look at the potential benefits

that playing a commercial MMOG can have on a learner's written accuracy, fluency, and lexical complexity.

The present study aims to contribute to this new area of research by trying to emulate an authentic OTS MMOG experience, by providing further information on whether or not commercial OTS MMOGs can be used as a medium for language learning, and whether or not it can lead to an increase in intermediate-level English language learners' written accuracy, fluency, and lexical complexity. It also aims to gather further information on the language learners' perceptions of using an MMOG as a language-learning tool.

2.6 Research Questions

With this study, I aim to answer the following four research questions:

Can the accuracy of an intermediate-level English language learner's written language improve through MMOG play?

Can the fluency of an intermediate-level English language learner's written language improve through MMOG play?

Can the lexical complexity of an intermediate-level English language learner's written language improve through MMOG play?

Do the participants feel that there is any benefit to learning a language through MMOG play?

Chapter Three – Methods

In the following chapter, I will describe the various methods that were used to gather the data for this study. This chapter is divided into four main sections. Section 3.1 includes information on the participants, section 3.2 describes the various instruments used to collect the data, section 3.3 outlines the procedures used to gather the data, and section 3.4 describes the preparation of the data.

3.1 Participants

Due to difficulties in the recruitment process, which are discussed further in the limitations section, eight participants (four ESL students and four EL1 speakers) were involved in this study. As this study aimed to emulate an authentic MMOG experience for the ESL students, the EL1 speakers were recruited to participate based on their interest in playing the game. Neither previous experience with the game, nor experience interacting with English language students was necessary. Detailed background information was not gathered from the EL1 speakers. The decision to recruit the EL1 speakers based on these criteria represents the random partner factor that the ESL students would encounter if they were to play an OTS MMOG on their own accord and not simply participating in the present study. The ESL students who participated in this study (three male and one female) (Table 1) were all enrolled in semester long (four months), intermediate-level, English as a Second Language classes at a Western Canadian university. The intermediate-level ESL students were recruited via posters, placed around the university's English Language Centre, and via two short in-person class visits. Intermediate-level participants were chosen, as their language skills would be of a high enough level for them to understand the basic text and commands of the video game and to be able to

communicate with the EL1 speaker. At the same time, intermediate-level language learners would be of a level that would show improvement in a shorter period than an advanced-level learner would. The participants ranged in age from 19 to 23. Two of the participants spoke Korean as their primary language and the remaining two participants' primary language was Japanese. The amount of time that the participants had been studying English in a formal environment varied widely, from a low of two years to a maximum of ten years. Participation in this study was voluntary, and the participants did not receive any monetary compensation for their time or participation. The MMOG used in this study, World of Warcraft (described in Table 1), requires the user to purchase the game initially and to pay per month. In this study, the ability to play the popular game for free was considered as incentive enough to encourage participation.

Table 1

English Language Learner Participant Characteristics

Participant	Age	Gender	Primary Language	Time Spent Learning English (Years)
1	19	Female	Japanese	6
2	22	Male	Korean	10
3	23	Male	Korean	10
4	21	Male	Japanese	2

Note. It is possible that (P4) misunderstood the question in regards to time spent learning English.

3.2 Instruments

3.2.1 Background

For this study, seven different instruments were used to gather data from the ESL participants: an initial background questionnaire (Appendix A); a background video game questionnaire (Appendix B); a post study questionnaire (Appendix C); an initial background interview (Appendix D); a post study interview (Appendix E); the MMOG World of Warcraft, and the World of Warcraft add-on Chatter.

3.2.2 Pre-study Questionnaire

The pre-study questionnaire (Appendix A) gathered the participants' demographic data and allowed the participants to self-report their English language abilities. The first 10 questions gathered the demographic data of the participants including: their name, age, gender, nationality, L1, highest level of education completed, other language learning experience, length of time spent studying English, any other language proficiency score, and reason for studying English. Although the participants were all recruited from intermediate-level ESL classes, the participants were asked to self-identify their English language listening, speaking, reading, writing, vocabulary, and grammar skills on a 7-point Likert scale, where 1 indicated a very low proficiency and a 7 indicated near fluency. This questionnaire was given to the students via a paper hard copy during the initial setup meeting and immediately before they began participating in the study. The participants were given as much time as they required in order to complete the questionnaire, but none of the participants took longer than ten minutes to complete it.

3.2.3 Video Game Questionnaire

The video game questionnaire (Appendix B) was given to the participants during the initial meeting following their completion of the initial background. The background questionnaire was developed based on the findings of the studies conducted by Peterson (2012), Rama et al. (2012), and Sylvén and Lundvqist (2012). Sylvén and Lundqvist (2012) found a correlation between the scores of their participants and the length of time that they spent playing video games, thus a question gathering information on the amount of time that the participants played, or did not play, video games was included. Rama et al. (2012) posited that the success of the lower-level learner in their study could be because of the lower-level learner's familiarity with that specific game. Therefore, a question asking the participants which games, if any, they played was included in the questionnaire. Both Rama et al. (2012) and Peterson (2012) reported that their participants felt that the video games provided a positive learning environment. A number of questions were created in an effort to gather the opinions and perceptions of the English language learners' on using a video game as a language learning resource at the onset of the study. The video game questionnaire was also piloted prior to the main study. The purpose of the background video game questionnaire was to gather background information on the participants' previous video game playing history, current habits, and sought to gather their perceptions of using video games to learn English. The questionnaire consisted of a combination of open-ended, multiple choice, and 7-point Likert scale questions. Like the initial background questionnaire, the video game questionnaire was given to the participants as a paper hard copy and the participants were given as much time as they required to complete it. None of the participants took longer than 5 minutes to complete the background video game questionnaire.

3.2.4 Pre-study Interview

Following the completion of the background questionnaire and video game questionnaire, the participants took part in an oral background interview (Appendix D). The decision to use a pre-study interview, in addition to the background and video game questionnaires, was made in order to allow the participants to explain, in more detail, their reasons for playing or not-playing video games, if they had ever tried an MMOG before, whether or not they had played a video game in a foreign language, and their opinion on using video games as a resource for learning another language. The interview also enabled me to seek further clarification on the participants' answers. Like the background video game questionnaire, these questions were developed and chosen based on the results from previous studies in this area including Peterson (2012), Rama et al. (2012), and Sylvén and Lundvqist (2012). The interviews were audio recorded on an HTC Sensation phone using the Smart Voice Recorder application and then transcribed fully before analysis.

3.2.5 MMOG - World of Warcraft

World of Warcraft is a fantasy-themed MMOG set in the same world as the popular Warcraft series. It follows the aftermath of a large war between the human alliance and the Orc-led horde, which were battling for control of the fictional world of Azeroth. Like other MMOGs, the player creates and customizes an in-game avatar, and then controls their avatar throughout the game. Gameplay consists of exploring the world, completing quests, gathering items, and leveling up. When their avatar gains a level, the character becomes stronger, is allowed to wear better equipment, and is able to learn new skills and abilities. Like other MMOGs, World of Warcraft promotes socialization and in-game cooperation by including a large number of group quests and the ability to form parties and guilds. Group quests are quests that require the

cooperation of a group of people in order to succeed, for example, defeating a large monster that would be too powerful for a single player and, once the monster is defeated, the entire group shares in the experience and items earned from completing the quest. The ability to form guilds allows players, who routinely play together, to create a group that facilitates in-game communication and a community that often offers assistance to their members by providing advice, in-game currency, or assistance with quests, for example.

Unlike most MMOGs, World of Warcraft also has a feature called Parental Controls. This feature allows another individual to monitor and limit the amount of time that a user plays the game. This feature is ideal for a parent who wants to monitor how much time their child is playing the game, or to set a weekly or daily limit on the amount of time that can be played. It is even possible to set a specific weekly schedule of times that the player is able to play or not play. When activated, a report (Appendix F) is sent to the parent's e-mail informing them of the times, duration, and date that the user played the game. This ability to monitor the amount of time and dates that the game was played is not only a great resource for a parent, but also a great feature for a researcher. By activating this feature, it is possible for the researcher to create and maintain a more controlled environment.

World of Warcraft, unlike some other MMOGs, is not free to play. As described in the previous chapter, MMOGs have a wide variety of fee structures. Some games require you to purchase the game initially, and then allow the purchaser to play the game for free. Other MMOGs are free to download and install, but allow in-game transactions using real money. There are also MMOGs, like World of Warcraft, that require you to purchase an initial copy of the game, and then pay a monthly fee. For this study, I purchased all copies of the game for the participants, in addition to the monthly fees associated with playing the game.

World of Warcraft was chosen as the commercial, OTS MMOG for this study for a number of reasons. It is currently considered the most popular MMOG, having been created in 2004 and currently possessing around 10 million subscribers (Karmali, 2012). The MMOG experience is greatly enhanced when there is a large and active player community. This community allows the player to easily complete the in-game quests and interact with other people. While other MMOGs have enjoyed popularity over the years, World of Warcraft has consistently remained one of the most popular. The game was also created and is maintained by a respected video game company, Blizzard, so the game is considered very stable with the support of a large and dedicated video game company.

3.2.6 Chatter

Like many MMOGs played on a computer, World of Warcraft allows the installation of additional software to compliment the game. This software is known as an add-on and usually provides additional interface options to assist the player during gameplay. Examples include displaying timers for in-game spells, recording battle information, or tracking items. For this study, the add-on Chatter was used to time stamp all of the in-game chat text, then automatically save, and export this data to a text file in the game's directory. The capture and analysis of participant chat logs was adopted from Rama et al. (2012). An example of the chat logs can be seen in Appendix G.

3.2.7 Post-study Questionnaire

Once the participants had played the game for a semester, they were asked to complete a post-study questionnaire (Appendix C). Like the pre-study questionnaires, the questions for the post-study questionnaire were developed and based off the findings from Peterson (2012), Rama

et al. (2012), and Sylvén and Lundvqist (2012). This questionnaire gathered the participants' perceptions of using a video game to learn English after having played World of Warcraft with an EL1 speaker. It consisted of a combination of open-ended and 7-point Likert scale questions. Like the initial background questionnaire and the video game questionnaire, the post-study questionnaire was given to the students as a paper, hard copy. The participants were given as much time as they needed to complete it. None of the participants took longer than 10 minutes to complete the post-study questionnaire.

3.2.8 Post-study Interview

After the participants had finished playing the game over the semester, a post-study interview was conducted (Appendix E). The decision to include a post-study interview in addition to the post-study questionnaire was to allow the participants the opportunity to provide a more thorough and in-depth account of their experience learning English through playing World of Warcraft with an EL1 speaker. The questions for the post-study interview were developed from the results of the studies conducted by Rama et al. (2012), Peterson (2012), and Sylvén and Lundvqist (2012) and also to gather and compare the perceptions of the participants towards using an MMOG as a language-learning tool. The interview gave the participants the opportunity to express themselves verbally and to provide more detail in their responses than solely via the post-study questionnaire. The post-study interview consisted of a series of yes or no questions (after which the participants were asked to expand upon their answers), 7-point Likert scale questions, and open questions. Like the pre-study interviews, the post-study interviews were audio recorded on an HTC Sensation phone using the Smart Voice Recorder application. The post-study interview was transcribed verbatim in order to better analyze the data.

3.3 Data Collection Procedures

3.3.1 Pilot Study

A pilot study was conducted during the semester before the main study was to begin. Its purpose was to ensure that all of the instruments (the consent forms, pre- and post-study questionnaires, the pre- and post-study interviews, and the game itself) that were to be used in the main study were of an appropriate level for an intermediate-level English language learner recruited from the ELC, to understand and to also streamline the procedures for the main study. It was also conducted to ensure that the intermediate-level students would be of an appropriate enough level to successfully understand the gameplay mechanics of World of Warcraft and be able to communicate with the EL1 speaker. The pilot study was conducted over the span of two weeks.

To recruit participants for the pilot study, I contacted the English Language Centre (ELC) on campus and informed them of my research and my desire to recruit an intermediate-level student for a pilot study. A poster targeting intermediate-level ESL students was displayed in the hallways of the ELC and a poster targeting EL1 speakers was displayed in the other sections of the university. One EL1 speaker and one intermediate-level ESL student, who were recruited from the same institution as the primary study, participated in the pilot study.

Once the participants contacted me, an initial setup meeting was organized for both the ESL student and the EL1 speaker. During this first meeting, both participants were given the consent forms, a copy of the game World of Warcraft was installed on their laptops, the add-on Chatter was installed onto the World of Warcraft client, the participants created game accounts, and the ESL student was given the initial background questionnaire, video game questionnaire,

and pre-study interview. The installation of the game occurred during the questionnaires and interview as a time saving measure. Once both participants had completed the game setup, they exchanged contact information and agreed to play the game together for two weeks. After the two weeks had passed, I met with the ESL student for a final meeting. During the final meeting, the chat log file from Chatter was copied from their laptop, and they completed the post-study questionnaire and interview.

Following the completion of the pilot study, it was found that the consent form, pre- and post-study questionnaires, and pre-and post-study interviews were of an appropriate level for the intermediate-level English language learner to understand. It was also found that intermediate-level ESL students from the ELC were of a high enough level that they could successfully play the game with an EL1 speaker. After consulting with the participants, two minor changes were made to the game setup process in order to streamline the initial meetings for the actual study.

1. Rather than having the participants install the game from the setup files, the game, with the Chatter add-on, was pre-installed on two USB flash drives, one MAC version and one PC version. The game files could then be transferred directly into a folder on the participants' computers without having to wait for the game to install, download, and patch. As the game itself is quite large, this change increased the speed of installation significantly.

2. I also decided to create game accounts and incorporate the parental controls for the participants prior to the initial meetings. During the initial meeting, I could then simply give the participants their account names and passwords, without having to guide them

through the setup process and have them wait while I ensured it was set up correctly. This decision also decreased the time required for the initial meeting.

The data collected from the pilot study were not included in the results of the primary study.

3.3.2 Main Study

3.3.2.1 Participant Recruitment

At the beginning of the winter 2014 semester, I began recruiting participants for the main study. I contacted the ELC on campus and informed them of my desire to recruit interested participants for my study. As I had already communicated with the ELC for recruitment for my pilot study, they were aware of my research and participant criteria. The associate director agreed to put up my recruitment posters. One of the posters was in English, and the other poster was in Mandarin. It was recommended that I provide a copy of the poster in Mandarin, as a significant portion of the students studying at the ELC were Mandarin speakers. The recruitment information was also distributed to a number of the instructors at the ELC to pass on to their students. I was also invited by two English language instructors, who taught the intermediate-level courses, to quickly describe my project to their classes and to provide my contact information for any interested students. Within a few weeks, I received e-mails from a number of interested intermediate-level participants, of which four agreed to participate in my study. There was no effort to recruit any particular participant characteristics for the study beyond their English language level and ability to have access to a computer or laptop that could play World of Warcraft.

Like the pilot study, posters advertising my study and looking for EL1 speakers were posted around the university campus. I also received permission to show the poster to a couple

of undergraduate Linguistics classes in order to help the recruitment process. There was no effort to recruit any particular characteristics of EL1 speakers, the only criteria were that they were an EL1 speaker and had access to a laptop or computer that could play World of Warcraft.

In total, four intermediate-level ESL students and four EL1 speakers agreed to participate in the present study. Each ESL students was randomly paired with an EL1 speaker and after the participants contacted me, the first meetings were arranged for each of the pairs.

3.3.2.2 First Meeting

Once the participants had been recruited and arranged into pairs, a time was arranged where both the ESL student and the EL1 speaker could meet with me on campus in order to set up the game and complete the pre-study questionnaires and interviews. Like the pilot study, during this initial meeting, both participants were first asked to read and sign their respective consent forms. Once the consent forms were signed, a copy of the game was transferred to both of their laptops using the USB flash drives. During the transfer, the participants were introduced to each other, exchanged contact information, and the ESL student was given the pre-study questionnaire and the video game questionnaire to complete. After the game was successfully installed on the EL1 speaker's laptop, they were given the login information for their account and asked to create a character on one of the game's servers. All of the participants' accounts were pre-made following the conclusion of the pilot study. The participants were all given an account name and password, and parental controls were placed on the accounts to e-mail me the dates and length of time that the pairs played the game. If they could successfully sign into the game and it worked on their laptop, they left the meeting with the promise to arrange time with the ESL student to play the game. After the EL1 speaker exited the meeting, the initial interview

was conducted with the ESL student and they were given their login information. The ESL student was then asked to try signing into the game and to create a character of the same race and on the same server as the EL1 speaker. If they could successfully sign into the game and it worked on their laptop, the first meeting was complete.

3.3.2.3 Gameplay

Following the initial meeting, the participants were instructed to play World of Warcraft with their partner, for as much time as they could, over the span of four weeks. During this period, the participants were required to arrange times where they could both play the game together. The total amount of time that the participants played the game varied, with the longest amount of time being 8.25 hours and the shortest amount of time being 5.5 hours. Table 2 of the Data Preparation section provides further details on the amount of time that each participant played the game. Participants were also instructed to play the game from different locations in order to encourage the use of the in-game chat functions, which were being saved by the add-on Chatter, and to avoid requiring the participants to arrange times and places for them to be physically present in the same location. I maintained regular contact with the participants to ensure that they were playing the game and to mediate any potential problems that the pair might be having in coordinating times or other conflicts. I also received weekly e-mails for each World of Warcraft account courtesy of the parental controls that had been set up for each account prior to the first meeting. These e-mails detailed the days and length of time that the game had been played. A record was also kept of when each pair began playing the game. This record was kept in order to determine when to add more money to the players' accounts. As World of Warcraft requires a monthly fee to play, additional game time was added to the players' accounts before they expired. Like the initial cost of the game, I also paid for the additional game time.

3.3.2.4 Final Meeting

After the four-week time period had passed, I contacted the participants in order to arrange a 30-minute final meeting with me. This final meeting was arranged in order to collect the data from the in-game chat logs and to allow the English language learner to complete the post-study questionnaire and interview. The final meeting was held on the university campus and included only the ESL students. The EL1 speakers were not included in the final meetings, as they were not required to complete any questionnaires or interviews. In addition, their in-game dialogue with the ESL student was also captured and saved by the Chatter add-on and included in the text file on the ESL student's computer. During the final meeting with the ESL students, the in-game Chatter chat log, which had been automatically saving on the participants' computers as a text file, was copied to the my computer. While the text file was being copied, the participant was given the post-study questionnaire to complete. Completion of the post-study questionnaire did not take any of the participants longer than 10 minutes. During the same meeting, and after the English language learner had completed the post-study questionnaire, the final interview was conducted. The final interview also did not take any of the participants longer than 10 minutes to complete. Once the chat log had been verified and the questionnaire and interview were completed, the participant was informed that they could remove the World of Warcraft files from their computer and were thanked for their participation in the study. Total time elapsed for the final meeting was not greater than 30 minutes.

3.4 Data Preparation

This section describes the process of preparing the data from the participants' chat logs, questionnaires, and interviews.

3.4.1 Chat Logs

Once the final meetings had been completed and I was in possession of all of the participants' data, I began reviewing the data gathered from the chat logs to determine what portions would be used for the analysis. As the Chatter add-on captures all of the in-game text, substantial portions of the chat logs contained non-relevant information to the research questions including: computer-controlled, non-player characters (NPC) text, quest text, battle text, other players' text, and item information. A partial example of the chat text can be seen in Figure 1. As the lines of numbers and text can be confusing, a map to the chat text and a description follows the example.

3/2 22:18:35.682 |Hchannel:PARTY|h[Party]|h ESLStudent: What is your quest?

3/2 22:18:38.722 Pluja-Terokkar nods.

3/2 22:19:07.522 |Hchannel:PARTY|h[Party Leader]|h EL1Speaker: im just getting it now

3/2 22:19:40.643 |Hchannel:PARTY|h[Party Leader]|h EL1Speaker: i just have to walk somehwewe

3/2 22:19:44.363 |Hchannel:PARTY|h[Party Leader]|h EL1Speaker: somewhere

3/2 22:20:11.643 |Hchannel:PARTY|h[Party]|h ESLStudent: do you have to kill assasin slain?

3/2 22:21:28.273 Goblin Assassin says: We'll kill anybody for the right price!

3/2 22:21:29.853 Goblin Assassin dies, you gain 24 experience.

3/2 22:21:37.673 Your share of the loot is 3 Copper.

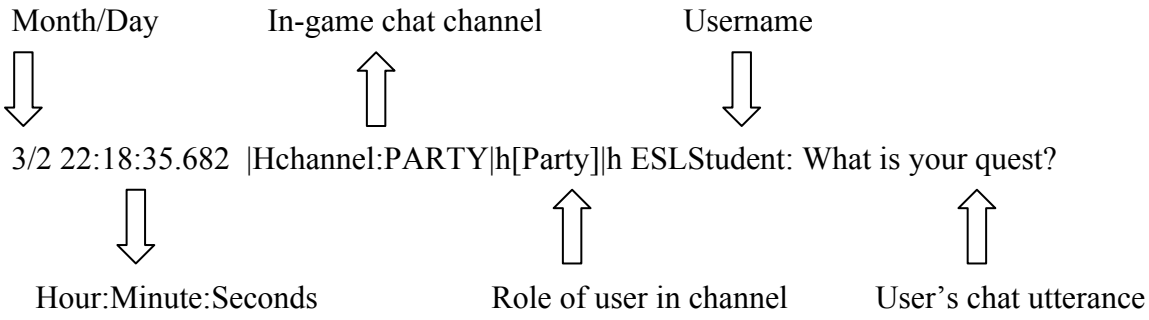

Figure 1. Example Chat Log and Description.

In the example of the chat text above, the date is first displayed on the left. In this example, 3/2 refers to the second of March. After the date, the time displayed in the 24 hour format, that the chat line was displayed can be seen. The first line, for example, was typed at 10:18 pm and also includes the seconds and milliseconds of the utterance. Following the time, the next line of text |Hchannel:PARTY| refers to the chat channel that this utterance was written on. In this case, the channel that this line was written on is a party channel. This refers to the way that the two participants are chatting with each other. The two participants have formed a

party so that they can chat with each other, even if they cannot see each other on the screen. This is very common in the game as it allows two or more people to stay in communication with each other no matter where they are in the game. For example, even if one player has to quickly go to town and sell items, they can still communicate with the other party members. They do not have to be physically near each other (in the game) in order to communicate. The next string of text h[Party]h refers to the role that the individual plays in the channel. In this instance h[Party]h informs us that the user is a member of the party and not the leader. Following the role of the user is the string ESLStudent. This string refers to the username or alias of the player who is sending the message. In this example, the actual usernames of the English language learner and the EL1 speaker were changed to protect their privacy. The actual message that the player sent follows the username. While all of this information might seem confusing at first, this information allows the players to differentiate between who is communicating with them in the game. In the example, the actual participants' chat has been bolded for ease of view.

At 22:18:38:722 the line "Pluja-Terokkar nods." can be seen. This line refers to another player's character using the in-game emote "nods" to express themselves. At 22:21:28:273 the line "Goblin Assassin says: We'll kill anybody for the right price!" is the line of a computer controlled monster. The following two lines are in-game information that refers to both the experience and reward for defeating the monster.

As the present study examines the interactions between the ESL student and the EL1 speaker, only their exchanges were included in the data analysis. Other lines of text such as quest text, non-participant text, and experience were excluded from the analysis. Some of the non-participant text was used to establish the environment that the participants were communicating in. For example, the battle text was used to determine whether or not the

participants were in a combat situation when an exchange occurred. Exchanges when the participants were battling a monster were also excluded from the analysis. During combat the focus is generally on defeating the monster(s) and preventing your avatar from being killed. For this reason, written communication is not a priority and the response times during an exchange tend to increase significantly.

3.4.2 Interviews

As the initial and final interviews were conducted in person, they needed to be transcribed for analysis. Once the interviews had been transcribed, their data were prepared for analysis. Both interviews included a series of open-ended questions, where the participant could explain, in more detail, their answers.

In the pre-study interview (Appendix D), open-ended questions allowed the participants to expand upon their answers to the previous questions. For example, question number 5 asked the participant "*Have you ever tried playing a massively multiplayer online game like World of Warcraft before?*" The participant would respond to this question by saying "*Yes*" or "*No.*" Question number 6 then asked the participant to expand upon their answer by asking "*Why?"* or "*Why not?"*

Like the pre-study interview, a number of questions in the post-study interview (Appendix E) were open-ended questions that required some preparation. Again, like the pre-study interview, some of the questions allowed the participant to expand upon their answer by asking "*Why"* or *"Why not"* to the previous question. The rest of the open-ended questions asked the participant a specific question that they could supply an answer to. For example, question number 16 asked the participants *"What did you like about playing the video game with*

a native speaker?" One of the participants responded with *"Yeah, first time I didn't understand everything because every word is English, but native speaker is teach me about everything and yeah."* In this example the results from this question was summarized as *"The native speaker could provide assistance."*

3.4.3 Questionnaires

The background questionnaire, video game questionnaire, and post-study questionnaire also contained a number of open-ended questions that needed to be analyzed for content and then summarized. Often the participants' responses consisted of one-word answers that did not require any further preparation. Like the interviews, the participants' responses were summarized when they described their answer in more detail.

Chapter Four – Data Analysis and Results

As noted earlier, both quantitative and qualitative data were gathered in this study. Quantitative data were gathered from the participants' chat logs, while qualitative data was collected via the semi-structured questionnaires and interviews. This chapter is divided into two sections. Section 4.1 addresses the quantitative data and describes the process of analyzing the chat logs and their results. Section 4.2 addresses the qualitative data and describes the process of analyzing the participants' background questionnaires, video game questionnaires, post-study questionnaires, their pre- and post-study interviews, and their results. In this chapter, the data gathered from each pair is presented in order of the four research questions. The first three questions examine the participants' chat logs for any increase in their English accuracy, fluency, or lexical complexity. Then, the perceptions of using an OTS MMOG as a language learning resource are presented for the fourth, and final, research question. Finally, this chapter concludes with a summary of the research findings.

4.1 Quantitative Data

4.1.1 Chat Logs

By the end of the four weeks, each pairing had played the game for a different amount of time (Table 2). Pairing 1 managed to play the game for 5.75 hours; pairing 2 played for 5.5 hours; pairing 3 played for 8.25 hours and pairing 4 played for 6 hours. The total amount of game time that the participants played was 25.5 hours. Over the span of the four weeks, participants also met a different number of times. Pairs 1 and 4 only met four times. Pair 2 met four times, and pair 3 met a total of 5 times. As each of the participants had played the game for a different amount of time, in order to compare the samples, the decision was made to analyze

the first and last 25% of each pair's exchanges. In order to calculate the first and last 25% of the chat logs, I first analyzed the participants' chat logs and determined how many exchanges between the EL1 speaker and the English language learner existed. After calculating the total number of exchanges, I then looked too see if any of these exchanges were made during a battle, if so, I excluded these exchanges. Following this step, I added up the total number of exchanges (minus those exchanges removed in the previous step) and calculated the first and last 25% of the exchanges from the new total number of exchanges.

Table 2

Amount of Time Played

Paring	Time Played	# of Times Participants Met
Pair 1	5.75	3
Pair 2	5.5	4
Pair 3	8.25	5
Pair 4	6	3

In order to calculate the number of exchanges for each participant two criteria were used.

The exchange should have a clear elicitation and a response.

The exchange should occur at a time where the participants are not engaged in a time-sensitive situation (i.e., battling a monster).

An example of an exchange that satisfies both criteria can be seen in Figure 2.

2/21 18:24:17.244 EL1Speaker says: <name removed> are you here?

2/21 18:24:17.827 Lowiss-Silvermoon pets Hercules.

2/21 18:24:29.256 Marshal McBride says: You are dismissed, Astarixi-Kilrogg.

2/21 18:24:43.804 ESLStudent says: YES

2/21 18:24:44.650 Därknessover-Uldum says: goodbye

2/21 18:24:53.462 EL1Speaker says: Okay let me add you as afriend

Figure 2. Participant Exchange Example.

As the above example shows, the EL1 speaker asked the ESL student a question, which the ESL student then provides a response to. In addition, unlike the sample chat log in Figure 1, there is no battle text included in the time around the interaction. With these two criteria satisfied, the first line and the fourth line together would constitute one exchange and be included in the data analysis.

After preparing the participants' chat logs, it was found that the number of exchanges produced by the participants ranged from a high of 491 exchanges to a low of 103 exchanges. The amount of exchanges produced by the pairs can be seen in Table 3. Once the exchanges had been organized, their analysis could begin.

Table 3

Number of Exchanges

Paring	Total Number of Exchanges	Number of Exchanges in the First 25% of Chat	Number of Exchanges in the Last 25% of Chat	Average Number of Exchanges per Meeting
Pair 1	109	28	28	40
Pair 2	103	26	26	25
Pair 3	491	123	123	98
Pair 4	114	29	29	38
Total number of exchanges	817			

Once each of the pairs' chat logs had been organized into their exchanges, I began to analyze their content. The participants' chat logs were analyzed for three different aspects. As outlined in the research questions, the participants' chat logs were analyzed to find evidence for any improvement to the participants' written English accuracy, fluency, and lexical complexity. How these three aspects were analyzed is described below. No inferential statistics were used to analyze the quantitative data gathered from the chat logs due to the low number of participants from which the data were analyzed.

4.1.1.1 Accuracy

The first research question examines the learners' written English accuracy. In order to analyze this language attribute, I used the following definition of accuracy as defined by Ellis and Barkhuizen (2005) "how well the target language is produced in relation to the rule system of the target language" (Skehan, 1996 as cited in Ellis & Barkhuizen 2005, p. 23). As mentioned in the data preparation section, the first and last 25% of the participants' exchanges were

analyzed for each pair. In order to measure the accuracy of the learners' chat text, I looked at whether or not the English language learners' turn contained an error. As noted in the literature review, for this study errors are considered "language forms that do not accord with either the rules or the norms of the target language" (Nassaji, in press, pg. 4). Another coder, who was also an EL1 speaker, coded the data in order to calculate inter-rater reliability. Coder 2 followed the same error definition when coding the errors to determine the accuracy of the participants' utterances. After coding the data for the four participants, I met with coder 2 and found that we were in agreement on 815 of 817 (99%) of the exchanges. A follow-up discussion regarding the two utterances that were in disagreement led to their successful resolution and an agreement of all 814 exchanges. The first utterance that was in disagreement was:

> Ummm, I just should kill 6 blackrock worgs?
>
> (P1)

This utterance was originally coded as being correct, but it was agreed that it was actually incorrect, as it should be "I should just kill 6 blackrock worgs?"

The second utterance that was in disagreement was:

> My level is 6.
>
> (P4)

This utterance was also originally coded as being correct, but it was agreed that it should be coded as incorrect, as it is more natural for a native speaker to say "I am level 6."

An example of the analysis for accuracy can be seen in the following example (Figure 3).

1 3/19 12:03:12.984 |Hchannel:PARTY|h[Party Leader]|h **EL1Speaker**: how was your class today?

2 3/19 12:05:00.991 |Hchannel:PARTY|h[Party]|h **ESLStudent**: I was very sleepy so I almost didn't listen talking of teacher.haha

Figure 3. English Language Learner Error Example.

In the exchange above, the first line is a prompt by the EL1 speaker and the second line is the ESL student's response. In this particular exchange the ESL student's response to the EL1 speaker's line contains an error as they write "I was very sleepy so I almost didn't listen talking of teacher. Haha." The segment of the sentence "so I almost didn't listen talking of teacher" is considered erroneous. Therefore, in this instance, this particular exchange would be coded as containing an error. By comparing the number of erroneous exchanges in the first 25% of their chat logs with the number of erroneous exchanges in the last 25% of their chat log, it is possible to see if there has been any improvement to their English language accuracy. The results of this analysis is discussed below.

Research Question 1: Can the accuracy of an intermediate-level English language learner's written language improve through MMOG play?

The comparison between the first and last 25% of their exchanges can be seen in Table 4.

Table 4

Number of Errors Produced in the First and Last 25% of Exchanges

	First 25% of Exchanges			Last 25% of Exchanges		
Participant #	Number of Errors	Number of Exchanges	Percent of Exchanges that Contain an Error	Number of Errors	Number of Exchanges	Percent of Exchanges that Contain an Error
1	4	28	14%	3	28	11%
2	1	26	4%	1	26	4%
3	11	123	9%	4	123	3%
4	5	29	17%	3	29	10%

A visual representation of the data in Table 4 can be seen in Figure 4.

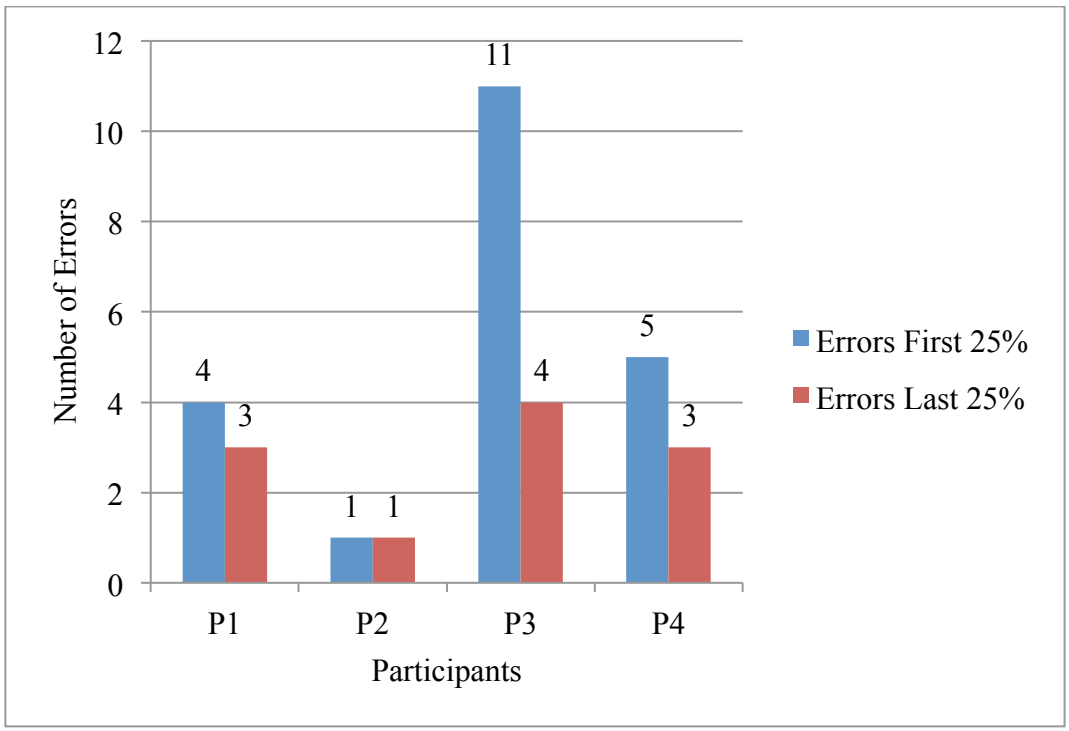

Figure 4. Participant Accuracy Comparison.

Table 4 and Figure 4 show the comparison between the number of errors that the participants created in the first and last 25% of their exchanges. As can be seen, with the exception of participant number 2, all of the participants made fewer errors in the last 25% of their exchanges with the EL1 speakers. This suggests that overall learners' accuracy increased, though slightly, because of playing the game.

4.1.1.2 Fluency

The second research question examines the learners' written English fluency. Fluency is defined by Ellis and Barkhuizen (2005) as "the production of language in real time without undue pausing or hesitation" (p. 139). As each of the lines in the chat logs are time stamped to the millisecond, it is possible to determine the amount of time that has elapsed between participant interactions. Following Rama et al. (2012), which determined that a decrease in the elapsed time between interactions was evidence of an increase in fluency, this study operationalizes the participants' fluency by measuring the amount of time that has elapsed between the initial EL1 speaker's prompt and the English language learner's response. Any decrease in the elapsed time between the first and last 25% of each of the participants' chat logs is considered an increase in their written English fluency. An example of how this measure is calculated is shown in Figure 5.

1 2/21 20:43:18.769 |Hchannel:PARTY|h[Party Leader]|h **EL1Speaker**: So let's go back to that guy

2 2/21 20:43:35.688 |Hchannel:PARTY|h[Party]|h **ESLStudent**: okidoki!

Figure 5. Elapsed Time Example.

In Figure 5, the first line produced by the EL1 speaker occurred at 20:43:18.769 and that the ESL student's reply occurred at 20:43:35:688. By subtracting the time of the ESL student's response from the EL1 speaker's prompt, a total of 16.919 seconds have elapsed. By averaging the first 25% of their exchanges and then comparing it to the last 25% of their exchanges, it is possible to see if there has been any improvement to their written English fluency. Unlike the analysis for learner accuracy, no reliability check was conducted on this measure as there was no inference or judgment involved.

Research Question 2: Can the fluency of an intermediate-level English language learner's written language improve through MMOG play?

Table 5 shows the average elapsed time for each of the participants for the first 25% of their exchanges with the EL1 speaker.

Table 5

Elapsed Time between the First and Last 25% of Exchanges

	First 25% of Exchanges		Last 25% of Exchanges		
Participant #	Number of Exchanges	Average Elapsed Time	Number of Exchanges	Average Elapsed Time	Difference
1	28	30 seconds	28	25 seconds	- 5 seconds
2	26	9 seconds	26	11 seconds	+ 2 seconds
3	123	11 seconds	123	8 seconds	- 3 seconds
4	29	35 seconds	29	28 seconds	- 7 seconds

A visual representation of the data can be seen in Figure 6 below.

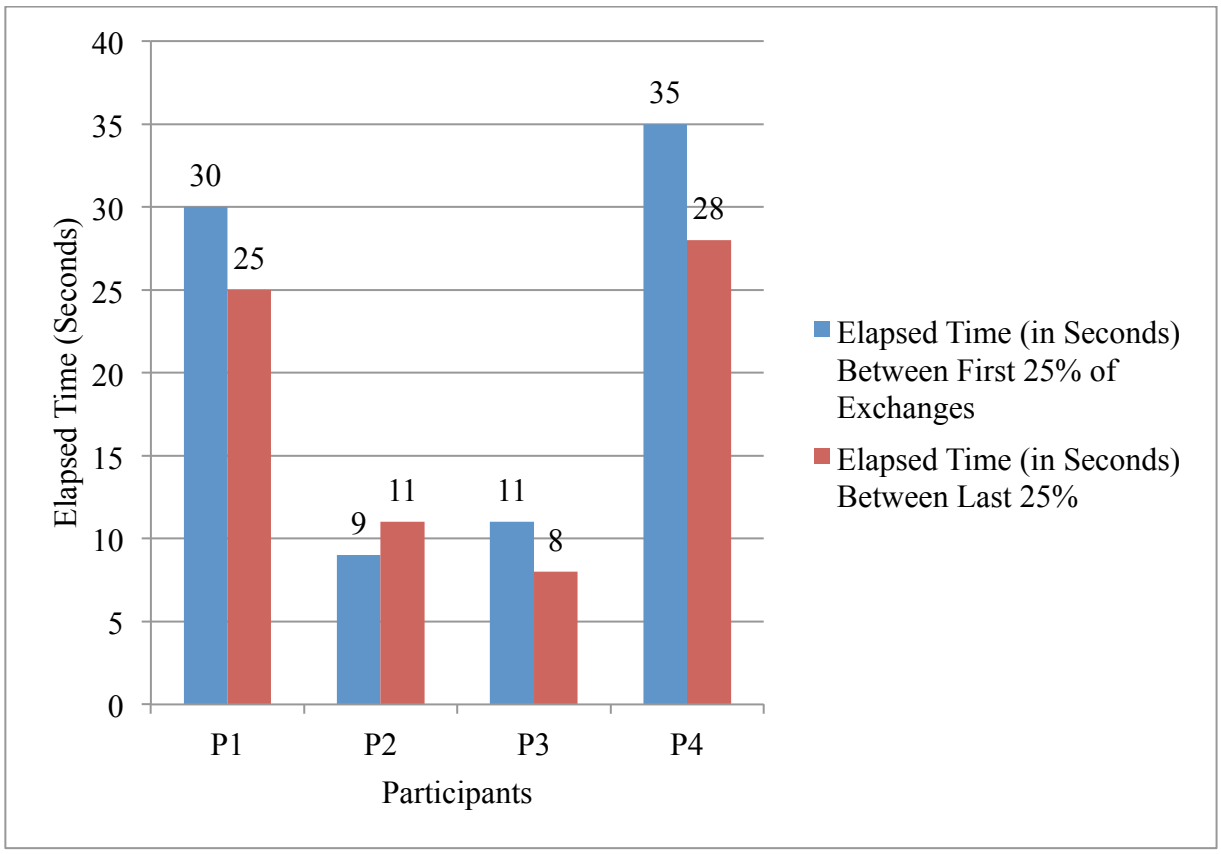

Figure 6. Participant Fluency Comparison.

After comparing the chat logs from the first and last 25% of the participants' exchanges in Table 5 and Figure 6, with the exception of participant number 2, all of the participants showed a decrease in the elapsed time between their exchanges with the EL1 speaker. This suggests that, overall, learners' fluency increased, though slightly, as a result of playing the game.

4.1.1.3 Complexity

The third research question examines the English language learners' lexical complexity. Complexity, as defined by Ellis and Barkhuizen (2005), "is the extent to which learners produce elaborated language" (p. 139). As there are a large number of ways that complexity can be

measured, for this study, I have chosen to focus solely on lexical complexity. Like Daller, Van Hout, and Treffers-Daller (2003) and Dimova (2007), in order to measure lexical complexity, I used type-token ratio. This ratio is defined as the "total number of different words used (types) divided by the total number of words in the text (tokens)" (Ellis & Barkhuizen, 2005, p. 154). The theory being that the higher the type-token ratio (that is the more unique words an individual uses), the more lexically complex their language is. For the present study, I will again be analyzing the first and last 25% of each of the participants' chat logs to calculate their ratio. By comparing the ratios from the first and last 25% it is possible to determine whether the participants are using more varied language at the end of the study. Like the measure of fluency, no reliability check was conducted on this measure as there was no inference or judgment involved. An example of the type-token ratio is shown in Figure 7.

1 3/19 12:32:11.939 |Hchannel:PARTY|h[Party Leader]|h EL1Speaker: Ready to go?

2 3/19 12:32:57.696 |Hchannel:PARTY|h[Party]|h ESLStudent: yes , I ready to go

Figure 7. Example of Type-Token Ratio.

In the second line of Figure 5 the ESL student used 5 unique words: yes, I, ready, to, and go. To calculate the Type-Token ratio I added up the total amount of unique words used by the ESL students in each turn and then divided it by the total number of words that they used. This process was repeated for each turn they had with the EL1 speaker. A higher score would then indicate that more of the words used are unique. By then comparing the first type-token ratio with the ratio calculated from the last 25% of the participants' exchanges, it is possible to see if the ESL students' lexical complexity has increased.

Research Question 3: Can the lexical complexity of an intermediate-level English language learner's written language improve through MMOG play?

Table 6 displays the total number of words, the number of unique words, and the corresponding type-token ratios for each of the English language learners. Participant number 1, for example, typed a total of 127 words in the first 28 exchanges with their EL1 speaker. Of these 127 words, 89 were unique. By dividing the number of unique words by the total number of words, a type-token ratio of 0.70 is found. A type-token ratio of 0.70 implies that 70% of the vocabulary used by the English language learner in their exchanges with the EL1 speakers was unique. A higher type-token ratio implies a higher level of lexical complexity, as the implication is that the individual has a more extensive vocabulary.

Table 6

Type-Token Ratio Comparison between First and Last 25% of Exchanges

	First 25%				Last 25%			
Participant #	Number of Exchanges	Unique Words	Total Words	Type-Token Ratio	Number of Exchanges	Unique Words	Total Words	Type-Token Ratio
1	28	89	127	0.70	28	62	87	0.71
2	26	17	35	0.48	26	32	46	0.69
3	123	129	227	0.56	123	95	203	0.46
4	29	47	74	0.63	29	44	64	0.68

A visual representation of the data from Table 6 can be seen in Figure 8 below.

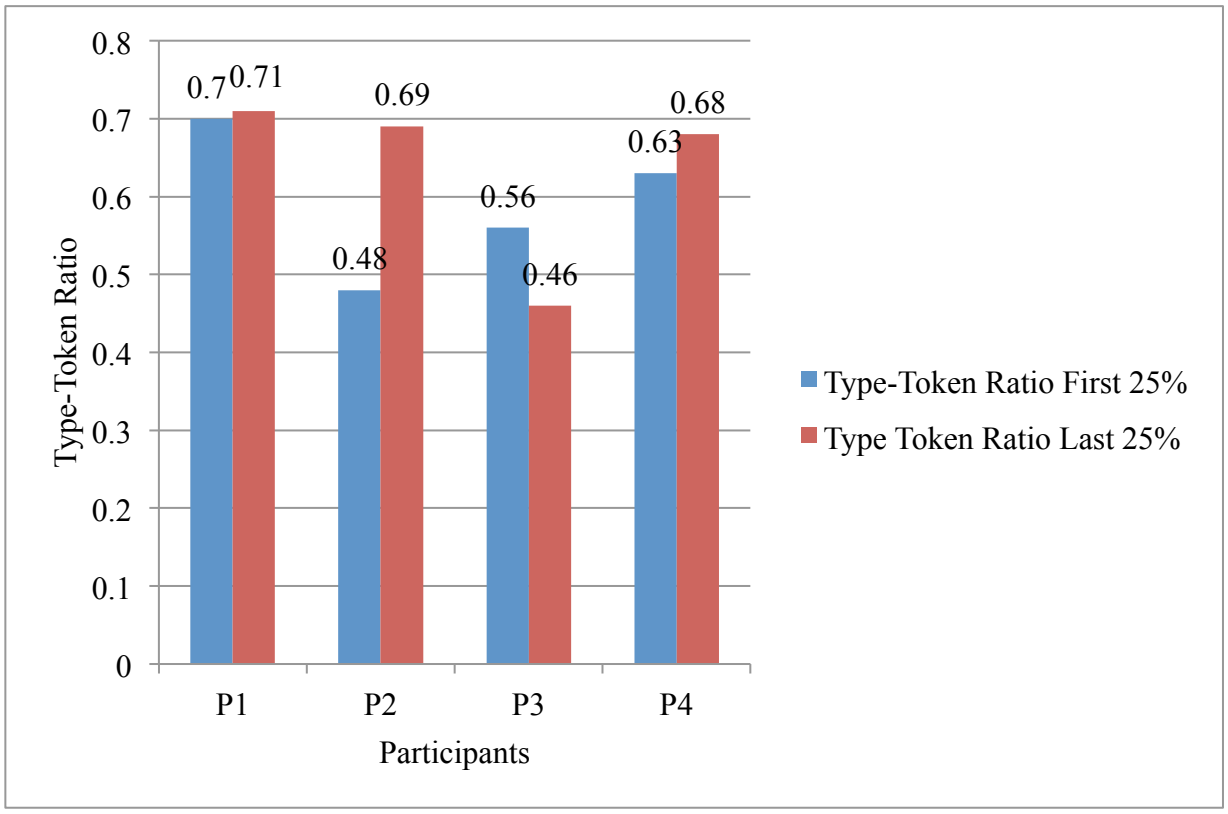

Figure 8. Participant Type-Token Ratio Comparison.

After comparing the chat logs from the first and last 25% of the participants' exchanges in Table 6 and Figure 8, with the exception of participant number 3, all of the participants had higher type-token ratios in the last 25% of their exchanges with the EL1 speakers. This suggests that overall, learners' lexical complexity increased, though slightly, as a result of playing the game.

4.1.2 Summary of Quantitative Data

The data gathered from analyzing the participants' chat logs for accuracy, fluency, and lexical complexity constituted the quantitative data for this study. After analyzing the first 25%

of the chat logs for the amount of errors formed (accuracy), the elapsed time between the EL1 speakers' prompts and the English language learners' replies (fluency), and their type-token ratios (lexical complexity) and then comparing it with the last 25 % of the chat logs, it is possible to determine if there has been any improvement to the accuracy, fluency, or lexical complexity of the English language learners. Table 7 provides a visual summary of the qualitative data gathered from the participants' chat logs.

Table 7

Summary of Quantitative Data

	Accuracy		Fluency		Complexity	
	Erroneous Exchanges		Elapsed Time Between Utterances (seconds)		Type-Token Ratio	
Participant	First 25%	Last 25%	First 25%	Last 25%	First 25%	Last 25%
1	4	3	30	25	0.7	0.71
2	1	1	9	11	0.48	0.69
3	11	4	11	8	0.56	0.46
4	5	3	35	28	0.63	0.68

It is important to note, that although there were changes in the accuracy, fluency, and lexical complexity of the participants, the differences were slight and the amounts of time that the participants played the game with the EL1 speakers were relatively low. Based on the results gathered from the quantitative data, all four of the participants showed some improvement in at

least one of the language attributes that were analyzed. Participants 1 and 4 showed improvement in all three of the areas (accuracy, fluency, and lexical complexity) that were examined. The accuracy of participant number 1 increased by 3%, while the accuracy of participant number 4 increased by 7%. The fluency of participant number 1 increased by 16%, while the fluency of participant 4 increased by 20%. The lexical complexity of participant number 1 increased by 1%, while the lexical complexity of participant number 4 increased by 8%. The accuracy of participant number 2 saw no change over the course of the study and their average response time actually showed an increase of 2 seconds rather than a decrease, showing a decrease in their fluency. Participant two, however, showed a 43% increase in their lexical complexity. Participant number 3 showed a 66% increase in their accuracy and a 27% increase to their fluency, but their type-token ratio was lower in the last 25% of their exchanges with the EL1 speaker, than the first 25%. The limitations of the results and the study are further discussed in Chapter five.

4.2 Qualitative Data

The fourth research question was answered using the responses gathered by the questionnaires and interviews. Both the interviews and questionnaires were analyzed qualitatively (Miles et al., 2014).

As described in the data preparation section, the open-ended questions on the questionnaires and interviews were first analyzed for their content, summarized, and then described. For example, question #15 of the post-study interview asks the participant "*Why do you think you will continue.*" One of the participants' responses was "*It's because it's fun, but*

there are lots of stuff I can learn." The participant's response to this question would then be summarized as "*fun"* and "*lots to learn."*

The ordinal data gathered from the 7-point Likert scale questions was first analyzed qualitatively and then described.

4.2.1 Questionnaires

Question number 4 of the pre-study Video Game Questionnaire asked participants "*How helpful do you think playing a video game can be to learning an additional language?"* Participants responded to this question on a 7-point Likert Scale where 1 was "not helpful," 2 was "somewhat unhelpful," 3 was "slightly unhelpful," 4 was "neutral," 5 was "somewhat helpful," 6 was "helpful," and 7 was "very helpful." Table 8 displays the results of this analysis.

Table 8

Belief That Playing a Video Game Can Be Helpful to Language Learning (Pre-Study)

How helpful do you think playing a video game can be to learning an additional language?	
Participant #	Response
1	4 (neutral)
2	2 (somewhat unhelpful)
3	5 (somewhat helpful)
4	5 (somewhat helpful)
Mean	4 (neutral)

Only one of the participants felt that, on the outset of the study, playing a video game would be "somewhat unhelpful" to learning an additional language. The other three participants,

however, felt that it could be either "neutral" or "somewhat helpful." The mean of the participants' answers was four, which implies that, in general, the participants had a "neutral" outlook that playing a video game could be helpful to learning an additional language.

Question number 7 of the post-study questionnaire asked participants *"How helpful was playing the video game to your overall English language learning?*" Participants were asked to indicate their responses on a 7-point Likert scale where 1 was "not helpful," 2 was "somewhat unhelpful," 3 was "slightly unhelpful," 4 was "neutral," 5 was "somewhat helpful," 6 was "helpful," and 7 was "very helpful." Table 9 displays the participants' responses to this question.

Table 9

Belief That Playing the Video Game Was Helpful (Post-Study)

How helpful was playing the video game to your overall language learning?	
Participant #	Response
1	5 (somewhat helpful)
2	5 (somewhat helpful)
3	6 (helpful)
4	6 (helpful)
Mean	5.5

The results from the question indicated that the participants felt that playing the game with an EL1 speaker was either "somewhat helpful" or "helpful" to their overall English language learning. The mean of the participants' responses was 5.5, which also reports that, in general, the participants felt that playing the video game was between "somewhat helpful" and "helpful" to their overall language learning.

Question number 5 through 10 of the Video Game Questionnaire asked the participants to what extent they felt that their specific English language skills (listening, speaking, reading, writing, vocabulary, and grammar) could improve through playing a video game. Participants responded to these questions on a 7-point Likert Scale where 7 was "very likely," 6 was "likely," 5 was "somewhat likely," 4 was "neutral," 3 was "somewhat unlikely," 2 was "unlikely," and 1 was "impossible." Figure 9 displays the individual results of this question.

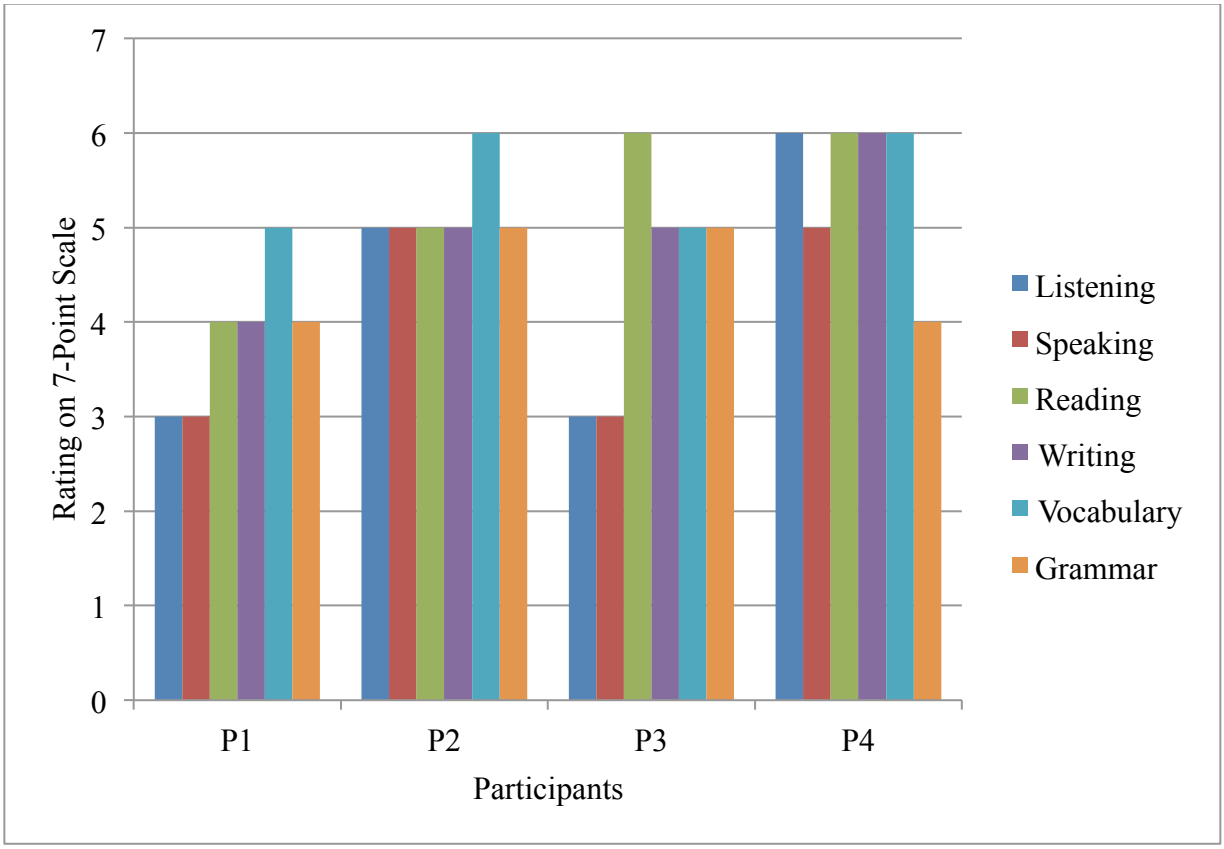

Figure 9. Belief That Specific Language Skills Could Improve.

In regards to their listening and speaking skills, the opinions of the participants were split. Two participants felt that it was "somewhat unlikely" for their English listening skills to improve, while two of the participants felt that it was "somewhat likely" or "likely" to improve. Two of the participants felt that it was "somewhat unlikely" for their English speaking skills to

improve, while two of the participants felt that it was "somewhat likely" they could improve. In regards to reading and writing skills, the majority of the participants felt that it was "likely" or "somewhat likely" for their English reading and writing skills to improve, while one participant was neutral. All of the participants felt that it was "likely" or "somewhat likely" for their English vocabulary skills to improve through playing a video game. The opinions of the participants were split when it came to grammar skills as two of the participants felt that it was "somewhat likely" for their grammar skills to improve, while the remaining participants were neutral.

Questions 1 through 6 of the Post-study Questionnaire asked participants to indicate on a 7-point Likert scale (where 1 indicated "no improvement," 2 indicated "very little improvement," 3 indicated "little improvement," 4 was "neutral," 5 indicated "moderate improvement," 6 indicated "large improvement," and 7 indicated "significant improvement") the belief that their English listening, speaking, reading, writing, vocabulary, and grammar skills improved after having played World of Warcraft with an EL1 speaker. Figure 10 displays the results of the participants' responses.

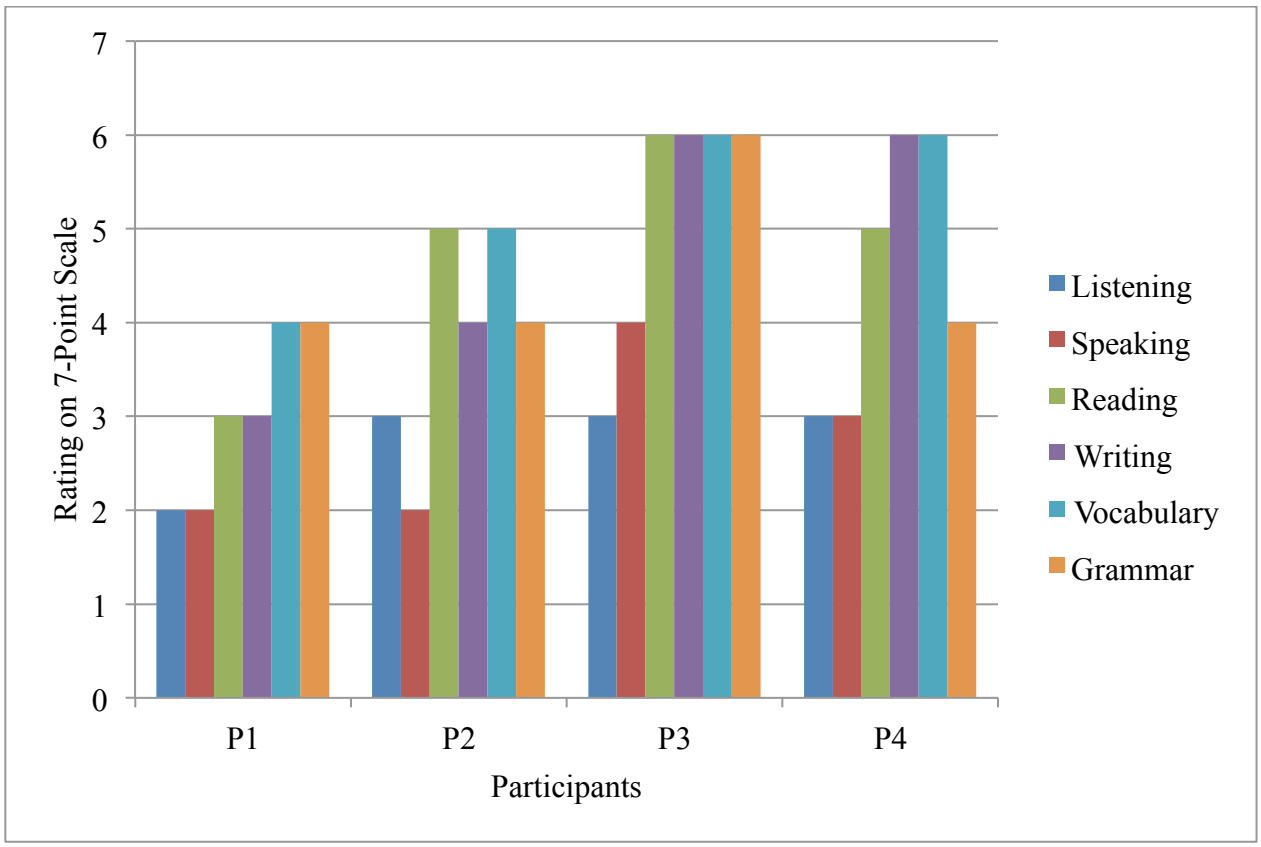

Figure 10. Belief that specific language skills improved through playing.

All four of the participants felt that their English listening skills had either a "small improvement" or "very little" improvement by playing the game with an EL1 speaker. Two participants felt that their speaking skills "improved very little," one participant felt there was a "little improvement" while one participant was "neutral." In regards to reading skills, one participant reported a "large improvement," two participants reported a "moderate improvement," while the last participant reported "little improvement." The participants' responses to writing skills improvement varied, with two participants reporting a "large improvement," one participant reporting a "little improvement," and the remaining participant staying "neutral." Two participants felt that their vocabulary skills saw a "large improvement," one reported a "moderate improvement," and the remaining participant was "neutral." Lastly,

three participants were neutral when reporting on the improvement of their grammar skills, with the other participant responding that their grammar skills were "largely improved." A more general comparison of the participants' responses can be seen in Table 10, which analyzes the means of the participants' individual answers.

Table 10
Pre-Study, Post-Study Means Comparison

Pre-Study		Post-Study	
Question	Mean	Question	Mean
Q# 4 Belief That Playing a Video Game Can Be Helpful to Language Learning	4	Q# 7 Belief That Playing the Game Was Helpful to Language Learning	5.5
Q# 10 Belief that Grammar Skills Can Improve	4.5	Q# 6 Belief that Grammar Skills Improved	4.5
Q# 9 Belief that Vocabulary Skills Can Improve	5.5	Q# 5 Belief that Vocabulary Skills Improved	5.25
Q# 8 Belief that Writing Skills Can Improve	5	Q# 4 Belief that Writing Skills Improved	4.75
Q# 7 Belief that Reading Skills Can Improve	5.25	Q# 3 Belief that Reading Skills Improved	4.75
Q# 6 Belief that Speaking Skills Can Improve	4	Q# 2 Belief that Speaking Skills Improved	2.75
Q# 5 Belief that Listening Skills Can Improve	4.25	Q# 1 Belief that Listening Skills Improved	2.75

Prior to the study, the participants were neutral towards the idea of playing a video game to help their English language learning. Once they had participated in the study, however, the participants' perceptions of using a video game as a language learning resource increased to a mean of 5.5, or between "somewhat helpful" and "helpful." When it came to the individual

English language skills, the participants felt that their English reading, writing, and vocabulary skills were the most likely to improve through playing the video games, while their grammar, listening, and speaking skills were less likely to improve. After having played the game with an EL1 speaker, the participants reported that their listening and speaking skills improved the least, however, they still believed that their vocabulary, writing, reading, and grammar skills slightly improved.

4.2.2 Interviews

The pre-study interview gathered background information on the habits of the participants and their perceptions towards using video games as a language learning resource. Their responses to these questions can be seen in Table 11. An inductive approach was used to compare the participants' answers on the pre- and post-study interviews in order to gain further insight into their perceptions of using an MMOG as a language learning resource.

Table 11

Participant Perceptions Prior to the Study

	Question	Yes	No	Why?	Why not?
Q2	Do you play video games?	2	2	• Socialize with friends (1) • Like playing them (1)	• Prefer to study, read or exercise (2)
Q5	Have you ever tried playing an MMOG like World of Warcraft before?	2	2	• Interest (1) • Looked fun (1)	• Didn't know how to find (1) • Didn't need to play them (1)
Q8	Have you ever played a video game in a language other than your native language?	1	3	• It was an accident (1)	• Never had the chance(1) • Difficult to understand (2)
Q11	Do you think that playing a video game can help you learn a language?	4	0	• Ability to communicate with native speaker (1) • Access to many new words (3) • Ability to practice (2)	

Note. The number in brackets refers to the number of participants who gave this answer.

While only half of the participants responded that they currently played video games and only half of the participants had tried playing an MMOG before, all of the participants felt that video games could be helpful to learning another language. One of the participants, for example, said:

> I think in the game, there are lots of words we don't use. When we're talking with friends. So I think we can find new words for ESL students.
>
> (P1, Pre-interview)

Another participant explained:

> I think to communicate with other native speaker in game it is very helpful.
>
> (P3, Pre-interview)

The majority of the participants cited having access to new vocabulary and one of the participants mentioned having access to L1 speakers were all reasons as to why they thought it would be helpful. Prior to the present study, only one participant had any experience with playing a video game in their non-L1 language, and they admitted that it was only very briefly as it was completely by accident that they had entered the game.

The post-study interview asked the participants to gauge whether or not they felt that their individual language skills improved through playing the game with the EL1 speakers and also asked them about their anxiety levels while communicating within the game. The responses to these questions have been summarized in Table 12.

Table 12

Experience in the Game

	Question	Yes	No	Why?	Why not?
Q2	Do you feel that your listening skills improved?	0	4		• No chance to listen (4)
Q4	Do you feel that your speaking skills improved?	0	4		• No speaking involved (4)
Q6	Do you feel that your reading skills improved?	4	0	• Lots to read (2) • Required to read (4)	
Q8	Do you feel that your writing skills improved?	4	0	• Had to type quickly (1) • Could ask native speaker for help (1) • Tried to type sentences correctly (2) • Many opportunities to write (1)	
Q10	Do you feel that your vocabulary skills improved?	4	0	• Many new words (4)	
Q12	Do you feel that your grammar skills improved?	3	1	• Exposure to correct grammar (3)	• Grammar not prioritized (1)
Q23	Did you feel anxious when playing?	0	4		• Enjoyable (3) • Communicating with native speaker was easy (1)

Note. The number in brackets refers to the number of participants who gave this answer.

None of the participants felt that their listening or speaking skills improved through playing the game with the EL1 speaker. When asked "*Why*?" all of the participants unanimously believed that there were no opportunities to listen to language within the game and the lack of ability to verbally communicate with the EL1 speakers. For example, one of the participants said:

> I couldn't talk to my partner on the online game. So, I couldn't hear the real voice. (P4, Post-interview)

Another participant explained:

> Because the characters [in the game] hardly ever speak. There was no chance to listen. (P1, Post-interview)

However, all four of the participants felt that their reading, writing, and vocabulary skills improved by playing the game with the EL1 speakers. Reasons for the improvement in their readings skills were unanimous amongst the participants and were believed to be due to the large amount, and variety, of text within the game. One of the participants, for example, said:

> Yeah, for example when I get a quest I have to read about story and quickly and summary yeah, so I think reading skill is improved.
> (P2, Post-interview)

Reasons for the improvement in writing skills varied with participants citing the necessity to type quickly, the necessity to write sentences correctly (in order to be understood), the opportunity to ask the EL1 speaker for assistance, and the opportunity to practice. One of the participants explained:

> I ask native speaker is this the right sentence or right grammar, so it is very helpful for me, so I could practice right sentence.
>
> (P3, Post-interview)

> When I chat with my native speaker I do my best making a complete sentence. Yes, so I think.
>
> (P4, Post-interview)

In regards to vocabulary, the participants unanimously pointed to the large amount of new words that were being used. One of the participants noted that many of the new vocabulary words were used repeatedly and were therefore easy to remember,

> There were a lot of words I don't so, I have to search. And then usually those words appear many times so I can remember.
>
> (P1, Post-interview)

When it came to grammar skills, the majority of the participants felt that their skills improved. Two participants felt that being exposed to correct grammar helped to improve their own skills. One of the participants credited the ability of the EL1 speaker to assist them as reasons why they felt their grammar skills improved.

> Because native speaker can revise my sentence English sentence. So it is very helpful for me.
>
> (P3, Post-interview)

The remaining participant felt that their grammar skills did not improve by playing the game as grammar was not prioritized during gameplay. They explained:

> Because I want to type more quickly, so I make my sentence to be short and sometimes without object.
>
> (P4, Post-interview)

When asked whether they felt anxious while playing the game with an EL1 speaker, all of the participants replied with a no. Reasons cited were that it was enjoyable and easy. After analyzing the responses of the participants, the common theme that occurred throughout the positive outcomes was the game's ability to provide a large amount of exposure to correct language. In the majority of areas where the participants felt the game was not helpful to language learning, the most common reason was a lack of exposure.

The post-study interview also asked participants to expand upon their experiences within the game and gather information on their English language learning plans following the completion of the study. The participants' responses to these questions are displayed in Table 13.

Table 13

Participant Opinions after Playing

	Question	Yes	No	Why?	Why not?
Q14	Now that the study is complete, do you think you will continue to play video games to help you learn English?	4	0	• Fun (2) • Easy to learn (1) • Opportunity to practice (2) • Exposure to new vocabulary (1) • Ability to learn quickly (2)	
Q25	Would you recommend video games to other people to help them learn a language?	4	0	• Fun (2) • Easy way to practice (2) • Good chance to communicate with native speakers (1) • Exposure to target language (1)	
Q16	What did you like about playing the game with the native speaker?	• Fun (1) • Native speaker could teach me (2) • Ability to interact with native speakers (2)			
Q17	What didn't you like about playing the game with the native speaker?	• Difficult to schedule (2) • Not familiar with native speaker (1) • Didn't feel it was difficult (1)			

Note. The number in brackets refers to the number of participants who gave this answer.

Despite only two of the participants playing video games prior to the study, all four of the participants responded that they planned to continue to use video games as a method to help them learn English. For example, one of the participants said:

> Because it's fun, but there are lots of stuff I can learn.
>
> (P1, Post-interview)

Another participant responded by saying:

> First of all just fun, and this game is familiar with me and I can learn English quickly and easily.
>
> (P2, Post-interview)

The participants highlighted the enjoyment of the learning through playing the game, the opportunity to practice as reasons for their decisions. All four participants also unanimously responded that they would recommend video games to other people in order to help them learn a language. Responses to the question "Why/Why not?" varied between the participants including:

> I have a friend and he plays video games a lot. And I heard that it is because he plays a lot of video games in English.
>
> (P1, Post-interview)

> I think very good.
>
> (P2, Post-interview)

> The ability to practice with native speaker.
>
> (P3, Post-interview)

> To talk to native speaker online, and to be able to talk to something for example, what happened on the weekend.
>
> (P4, Post-interview)

Question number 16 of the post-study interview asked participant's "*What did you like about playing the game with the native English speaker?"* The majority of the participants highlighted

their interactions with the EL1 speaker as one of the main reasons. One of the participants explained that:

> Playing together was fun, if I was playing with just myself, it would be boring I think. But with <name removed> was fun.
> (P1, Post-interview)

Another participant highlighted the ability of the EL1 speaker to help them:

> Yeah first time I didn't understand everything because every word is English. But native speaker is teach me about everything and yeah.
> (P2, Post-interview)

Question number 17 of the post-study interview asked participants "*What didn't you like about playing the game with the native speaker."* Only three of the participants provided answers to this question. Of the participants who responded, the majority highlighted the difficulty in arranging or scheduling a time when they could play with the EL1 speaker. For example, one participant explained:

> It doesn't mean I didn't like to play with <name removed>, I didn't like to, like when she has a time sometimes I didn't have time, and sometimes when I have time, she doesn't have time.
> (P1, Post-interview)

In the case of one of the participants, P2 explained that they were not very familiar with their partner, so it was difficult to communicate about things other than the game.

> In my case, I don't familiar with my native speaker, so, just I think we just play the game so I don't have a chance to speak many time.
>
> (P2, Post-interview)

4.3 Summary

This chapter presented the results that were gathered from the chat logs and the pre- and post- study questionnaires and interviews. The chat logs were used to gather the quantitative data and analyze the participants' written English accuracy, fluency, and lexical complexity, while the questionnaires and interviews gathered the qualitative data and participants' perceptions towards using an MMOG as a language learning resource. Based on the definitions used in this study, two of the four participants showed some improvement in their written English accuracy, fluency, and lexical complexity after playing World of Warcraft with an EL1 speaker. The other two participants showed improvement in some, but not all, areas. In general, all participants held a positive perception towards learning a language through playing an MMOG. The participants felt that at least some of their English language skills improved through playing the game. Every participant planned to continue to play video games to help him or her learn English. All of the participants felt that playing the game created a low anxiety environment, and every participant responded that they would recommend video games to other people to help them learn a language. In the interviews, the participants continually highlighted having access to EL1 speakers, the enjoyable environment the game creates, and exposure to the language as the main reasons for their positive perceptions.

Chapter 5 – Discussion, Limitations, and Implications

The aim of the present study is to examine the potential benefit that playing an OTS MMOG (in this study World of Warcraft) can have on intermediate-level English language learners' written accuracy, fluency, and lexical complexity. It also investigates the learners' perceptions towards using an MMOG as a language learning resource. The data used in the analysis were collected by analyzing the participants' chat logs and their pre- and post-study questionnaires and interviews. This chapter consists of three main sections. The first section discusses the findings from each of the participants as they relate to the four research questions. The second section discusses the limitations and implications of the present study. The last section of the chapter provides a conclusion.

5.1 Discussion

5.1.1 Research questions 1, 2, and 3: Can the accuracy, fluency, and lexical complexity of an intermediate-level English language learner's written language improve through MMOG play?

This section discusses the results of analyzing the participants' written English accuracy, fluency, and lexical complexity after playing the MMOG World of Warcraft with an EL1 speaker for four weeks. As MMOGs are a relatively recent addition to the video game world, their analysis as a potential language learning resource is an even newer field. As a result, there are not many studies with which to compare the results of the present study. Theories such as Krashen's Input Hypothesis, Affective Filter Hypothesis, and Vygotsky's Sociocultural Theory, as well as previous studies in the applied linguistic and education fields such as: Chen and Yang

(2013), Peterson (2012), Rama et al. (2012), Ranalli (2008), Suh et al. (2010), and Sylvén and Lundqvist (2012) all indicate that there is some potential benefit for using video games as a language learning resource. None of the aforementioned studies looked specifically at the number of errors that the learners created over the play period (accuracy) or their type-token ratio (lexical complexity). Rama et al. (2012) also used participants' chat logs to see if there was any improvement in their participants' general communicative ability, but they did not specifically focus on the time that elapsed between exchanges as a measure of fluency. There are no studies, to my knowledge, that have tried to analyze a language learner's written accuracy, fluency, and lexical complexity after they have played an OTS MMOG with an EL1 speaker by analyzing their chat logs. In order to investigate the first three research questions, the participants' chat logs were analyzed for the amount of errors that they formed (accuracy), the amount of time that elapsed between the EL1 speakers' prompts and the English language learners' reply (fluency), and their type-token ratio (lexical complexity) in the first and last 25% of their exchanges. The results of these comparisons were then reported on.

As presented in the fourth chapter, two of the four participants showed an increase in their accuracy, fluency, and lexical complexity. More specifically, three of the participants made fewer errors in the last 25% of their exchanges with the EL1 speakers than in the first 25% of their exchanges. The majority of the participants also showed an increase in their fluency, as they showed a decrease in the amount of time that elapsed between their responses to the EL1 speakers' prompts between the first and last 25% of their exchanges. The majority of the participants also showed increases to their type-token ratios between the first and last 25% of their exchanges. Overall, these results seem to indicate that a language learner's accuracy, fluency, and complexity can improve through play of an OTS MMOG with an L1 speaker.

While this conclusion may have some merits, it should also be mentioned that not all of the participants made similar improvements. As was noted, participant numbers 2 and 3 did not show improvement in all three areas. In fact, participant number 2 showed a slight decrease to their written English fluency and participant number 4 showed a decrease in their lexical complexity. The exact reasons as to why the results of participant numbers 2 and 4 deviated from the other participants are unknown, but there are a number of possible reasons for this disparity.

The first and perhaps most likely reason for these differences could be the methodology of the present study. In order to recreate an authentic OTS MMOG experience for the participants, there were no specific recruitment criteria for the EL1 speakers beyond having access to a laptop that could play World of Warcraft and their interest in participating. As each participant was paired with a different EL1 speaker, his or her experiences within the game were different. Personality or enthusiasm differences between the EL1 speakers could have had an influence on the interactions within the game. For example, if the native speaker in one pairing was more, or less talkative than in another, it would have an obvious influence on the communication within the game and therefore have an impact on the corresponding English language learner's chat log.

In addition, as video games often require the player to complete multiple tasks simultaneously, and therefore spelling and grammar are often not prioritized, acronyms and short forms for words abound. Peterson (2012) refers to this type of game or internet language as a "digital vernacular" (p. 378). Presumably, using Krashen's Input Hypothesis, if the English language learner was consistently exposed to comprehensible and correct language, they should be able to improve their language skills. After reviewing the utterances by the EL1 speakers,

however, there were no noticeable differences in the type of language used or the amount of prompts between EL1 speakers who were paired with participant numbers two and three, and the EL1 speakers who were paired with the other participants.

Another potential reason for the differences stems from the way in which the data were analyzed. As each pair ended up playing the game for different amounts of time, they also communicated with their EL1 speaker in different amounts. As noted in chapter three, the participants' chat logs ranged in number from a high of 491 exchanges to a low of 103.

It is also possible that the deviation stems from the difference in the amount of time that the participants played. All four of the participants played World of Warcraft with their EL1 speakers for different amounts of time. The amount of time played ranged from a high of 8.25 hours to a low of 5.5 hours.

The reasons for the difference in results are unknown, and the deviation could be caused as a result of limitations in the study's methodology. These limitations are discussed in the Section 5.2. Despite the fact that two of the participants did not improve in every area that was analyzed, they showed improvement in at least one area. The results for the other two participants show that playing World of Warcraft with the EL1 speaker benefited all three of the areas researched.

5.1.2 Research question 4: Do the participants feel that there is any benefit to learning a language through MMOG play?

Following the completion of the study, all four of the participants indicated in the post-study questionnaires and interviews that playing the game with the EL1 speaker was helpful to their language learning in general. When asked about improvement to their specific language

skills, the participants felt that playing an MMOG with an EL1 speaker was the most helpful for their reading, writing, and vocabulary skills. Reasons for these improvements included: having access to L1 speakers, having exposure to a wide variety of English language text, the necessity to write quickly and correctly, and having exposure to grammatically correct text. The two skills that the participants felt improved the least through playing the game were listening and speaking. The lack of exposure to audio stimuli and the lack of opportunities to speak were unanimously cited as reasons for the lack of improvement in these areas.

Participants found that using an MMOG as a language learning resource was both highly motivating and created a low anxiety environment. At the outset of the study, only half of the participants responded that they currently played video games. Following the study, however, all of the participants indicated that they planned on continuing to use video games to help them learn English. All of the participants indicated that they would recommend video games to their friends to help them learn a language and all of the participants indicated that the game created a low anxiety environment in which to learn. The participants highlighted that it provided access to EL1 speakers, was easy to communicate with the EL1 speakers in this manner, that the game itself was fun, and that they thought their language skills could improve through playing.

The only difficulties that were noted stemmed from the difficulty in scheduling times that were mutually agreeable to both participants. As both the English language learners and the EL1 speakers were full-time students, the participants cited difficulty in finding times where they could both play together. In a non-study environment, however, this difficulty would be mitigated, as the player is able to play the game with anyone, compared to the present study where the pairs were required to play solely with each other.

The favourable attitudes towards using video games as a language learning resource by the participants is consistent with the data collected by Chen and Yang (2013), Peterson (2012), Rama et al. (2012), and Ranalli (2008). In all four of the aforementioned studies, participants responded favourably towards using video games as a language learning tool and cited their ability to motivate and their low-anxiety and pleasurable learning environment (Krashen, 1981). Whether or not there was an increase in their accuracy, fluency, and lexical complexity as indicated through the analysis of the chat logs, all of the participants of the present study perceived there to be benefits to language learning through MMOG play them learn a language.

5.2 Limitations and Implications

As was touched on in the discussion section, a number of potential limitations affect the results of this study. These limitations, as well as a number of difficulties that occurred when trying to conduct a longitudinal study of this nature, are discussed in the following section.

5.2.1 Sample Size

The first limitation is the small sample size that participated in this study. As only four intermediate-level English language learners participated in this study, the results gathered from this study may not be representative of all intermediate-level English language learners. The study was originally designed to accommodate a total of twelve participants, six intermediate-level English language students, and six EL1 speakers. As the present study was longitudinal and required participants to arrange multiple meetings with their partner and play the game for a number of hours each week, participants expressed great concern at the length and the amount of work required to participate, as they had a number of other courses and social engagements. The courses that the English language learners were enrolled in at the English Language Centre on

campus were considered intensive, and a great deal of the participants had a number of assignments and homework that was required to be completed. This problem was exacerbated towards the end of the semester when both the English language learners and the EL1 speakers wrote final exams and papers. A number of participants also originally expressed interest in the study and began to participate, but then had to withdraw. In response to these concerns, the decision was made to proceed with the study with the eight total participants (four EL1 speakers and four intermediate-level English language learners). As a result, no inferential statistics were used to analyze the quantitative data, as the sample size was too low to generalize. The small number of participants, however, does not necessarily invalidate the results. Studies that have examined the role that MMOGs can have on language learning such as Rama et al. (2012) and Peterson (2012) also have small sample sizes with six and four participants, respectively.

Similarly, the amount of time that the participants played the game is also a potential limitation. Participant 1 played the game World of Warcraft with an EL1 speaker for 5.75 hours, participant 2 played the game for 5.5 hours, participant 3 played the game for 8.25 hours and participant 4 played the game for 6 hours. As a result of these differences, the number of exchanges that were formed between the pairs was also different. The differences in the time played and the number of exchanges created leads to a potential problem in comparing the results among participants. The decision to analyze the first and last 25% of each participant's chat logs was an attempt to equalize their results.

The in-depth qualitative data that were gathered from the results of the present study are consistent with the results reported from other researchers in this area. While the results gathered from the chat logs may not be generalizable to a larger sample, these results combined

with the data from the interviews and questionnaires provides insight into how commercial OTS MMOGs like World of Warcraft can act as a resource for a language learner.

5.2.2 Methodological Limitations

The decision to investigate the participants' chat logs for improvement on the participants' accuracy, fluency, and lexical complexity was an attempt to discover if playing a commercial MMOG can positively contribute to an individual's language skills other than vocabulary. To do this required solid definitions for accuracy, fluency, and lexical complexity. In their book *Analyzing Learner Language,* Ellis and Barkhuizen (2005) provide definitions for these terms, and it was these definitions that were employed in this study.

After defining these terms, the next task was to determine methods that could be used to measure them in an MMOG setting. This task proved to be difficult as the language used by gamers in an online setting, and by extension the language captured in the chat logs, is essentially an oral language that is written. Long complex sentences are purposely avoided in many scenarios in favour of short, but salient utterances. This decision is especially true during chaotic or fast-paced sections of the game, for instance during battles. This makes a written analysis difficult, as much of the research that has been conducted in the area of second language acquisition writing tends to examine participant essays and lengthy written work (Ellis & Barkhuizen, 2005). These utterances also cannot be measured using the same methods that are employed in spoken language because attributes like pauses and false starts are non-existent. It is not possible to know if a student began typing and then stopped, only to begin typing again unless the participant was being physically monitored at all times while they were playing the game. Ellis and Barkhuizen (2005) also describe a number of different analyses that can be used

to measure these various aspects of language learners' written or spoken language. Methods described by Ellis and Barkhuizen (2005) to analyze participant accuracy include: number of self-corrections, percentage of error free clauses, errors per 100 words, percentage of target-like verbal morphology, percentage of target-like use of plurals, and target-like use of vocabulary. Due to the nature of the chat logs, the decision was made to use errors per turn, and adapt it to errors per first 25% of exchanges and errors per last 25% of exchanges. These two numbers were then compared. Similarly, the authors provide a number of different approaches to measure fluency including: speech/writing rate, number of pauses, length of run, false starts, repetitions, reformulations, and replacements. As these methods can only be realistically used for oral speech analysis, the present study adopted the method of measuring fluency that was used by Rama et al. (2012). This method involves looking at the timestamp that exists on the chat log utterances and comparing it. Presumably, a lower elapsed time between utterances would indicate a faster response time and therefore a higher level of fluency. The method used to measure lexical complexity was also outlined in Ellis and Barkhuizen (2005). They highlight type-token ratio as the only method to measuring lexical complexity and as a result, this method was employed. Although type-token ratio has been used in previous research, one limitation is that it can vary depending on the length of the text.

The results of the present study could be different if different methods or definitions were used. The difficulty arises in choosing specifically which definitions and methods should be employed. As research into video games, and more specifically MMOGs like World of Warcraft as language learning resources is a new area, it is possible that new methods need to be developed in order to more accurately measure the variables involved in this research.

5.2.3 Pedagogical Implications

A number of potential pedagogical implications stem from the results of this study. In recent years, video games have seen a surge in popularity amongst all demographics. While they have been traditionally seen as a medium for entertainment, researchers and educators have begun to recognize their potential as pedagogical tools as well. Many specially designed educational video games have been created over the years in an effort to try to bridge the gap between education and entertainment. Compared to commercial games, however, these educational games are not nearly as popular. With the advent of high-speed Internet and powerful graphics cards, commercial games are becoming much more immersive and act as platforms for socialization. The stereotype of the single, male gamer playing video games in his parents' basement by himself is outdated.

The results of the present study, which contribute to the growing body of research on MMOGs, give credence to the argument that video games do not have to be solely considered as a source of entertainment, but that they can be useful in a pedagogical context as well. Other Research done in this area such as Baltra (1990), Barseghian (2011), Gee (2007, 2011), Prensky (2001), and Ranalli (2008) all also highlight the ability of video games to provide a high amount of motivation, define clear goals, provide instant feedback, allow learning through experience and reduce learner anxiety. These attributes are all characteristics that educators try to foster in classes of any discipline. MMOGs, in particular, have the potential to effortlessly provide the type of motivation and communicative environment that language teachers are continually trying to foster in language classrooms. The results from the present study show that a commercial MMOG has the potential to positively contribute to vocabulary acquisition, reading skills, and

writing skills. The game can also provide a low anxiety environment, a high amount of learner motivation, and provides access to L1 speakers. These findings are consistent with other research in this area by Chen and Yang (2012), Peterson (2012), Rama et al. (2012), Ranalli (2008), and Sylvén and Lundqvist (2012).

Potential criticism of using MMOGs as a language-learning tool often stems from the fact that many L1 speakers do not employ 100% "correct" grammar and punctuation when they play. As video games are often fast-paced and require the user to simultaneously concentrate on multiple aspects of the game, the in-game speech often consists of short, abbreviated text in an effort to maximize the saliency of the message while using minimal effort. This type of speech is what Peterson (2012) calls "digital vernacular" (p. 378). An example of this speech is the abbreviation of "*be right there*" to simply "*brt."* While some language educators may decry exposure to grammatical incorrect or abbreviated language, it is worth noting that the digital vernacular is becoming more common and popular even outside of the video games and exposure to natural and authentic language is never negative. In addition, qualitative data from the present study suggests that the English language learners actually stressed the importance of using correct grammatical sentences when they were playing, as they wanted to ensure that the EL1 speaker they were paired with could understand their sentences.

The goal of the present study is not to encourage all language students to subscribe to World of Warcraft instead of attending formal language classes, but rather it aims to show that video games, and more specifically MMOGs, can be a potentially useful tool for language educators to employ. If a language instructor encourages their students to engage with fluent speakers of the target language and practice using the language outside of the classroom, an MMOG, played in the target language, satisfies all of these goals.

5.2.4 Implications for Future Research

As outlined in the limitations section above, this area of applied linguistics is still in its infancy, and the reality of researching a new area has both its strengths and weaknesses. On one hand, there are few previous studies in the area in question with which to guide the research and adopt methodology from, while, on the other hand, studying a new area provides the researcher with the opportunity to explore and discover new and exciting results.

There are a number of possible future research directions that stem from the present study. As was described in the results section, only two of the four participants showed an increase in all three of the areas that were analyzed (accuracy, fluency, and lexical complexity). The exact reasons for the disparity between the two participants and the rest of the sample are unknown, but re-conducting the present study with the same instruments may help determine whether or not the results were generalizable, or if the anomaly was a result of demographic or personal attributes of that particular participant.

Since few studies have examined the role that MMOGs can have on the skills of language learners, a large opportunity exists to further explore this area. Many of the studies that have been conducted in this area, like Peterson (2012), Rama et al. (2012), and the present study, all contain small sample sizes. While having a small sample size does not automatically preclude significance, it often makes generalizing the results to the greater population impossible. As a result, there exists the opportunity to try to increase the sample sizes in order to provide more generalizable results. Some of the research in this area has used larger sample sizes, such as Suh et al. (2010), which used the data gathered from 220 students. The difference between the study conducted by Suh et al. (2010) and studies like Rama et al. (2012) and the present study lies in

the manner in which they were analyzed. Suh et al. (2010) employed the use of a pre- and post-test design in order to determine if there was any improvement in the participants' language abilities before and after playing the game, while Rama et al. (2012) looked at the participants' chat logs as they progressed through the study. A pre- and post-test design and one that analyzes the chat logs gather different information. It may be easier to use a pre- and post-test design with a larger sample size, but to my knowledge, the only way to measure a skill like fluency, in this research context, is by using the in-game chat logs. The difficulty then arises, on the part of the researcher, of having to analyze hours of in-game chat logs for each of the participants. There has scant research that has analyzed participants' chat logs with a sample size larger than the present study but a similar study with a larger number of participants would certainly lead to more validity of the results.

Another potential venue to investigate further stems from the methods of the present study. As was mentioned in the limitations section, in the present study, each English language learner was paired with a different EL1 speaker. This decision was made due to logistical reasons, as it was impossible to have one EL1 speaker who was able to play the game with all of the participants. By using different EL1 speakers, however, the amount of interactions and the experience of the participants within the game itself varied. Presumably, the differences in these interactions could cause the outcomes of the analyses, and therefore the results, to vary among the participants. These differences make the comparison of the results difficult and detract from the generalizability of the study. Repeating the study using the same EL1 speaker might ensure that the participants' experiences were more consistent. This similarity would again help to make the results more generalizable to a larger population.

Currently there are a large number of MMOGs available for players to choose from. MMOGs now encompass virtually every genre of video game and range in price from being free, to costing a monthly fee. The present study, as well as Rama et al. (2012) chose to use the MMOG World of Warcraft. The reasons for choosing this particular MMOG for the present study was due to its popularity (it is currently the most successful and popular MMOG) and the ability to enact parental controls on the participants' accounts. Choosing an MMOG that has a large player base is important, as collaboration with other players is often required to complete quests, and having a large player base increases the likelihood of interactions with other people. World of Warcraft, however, is a fantasy-themed MMOG and the vocabulary is often genre specific. That is to say, it uses a fair amount of context specific vocabulary including words like *sword*, *dragon*, and *orc*, and so on. Other MMOGs in different settings, such as Second Life, make use of an entirely different vocabulary set. The vocabulary used in a game like Second Life tends to be far more mainstream as it uses mainly common day-to-day vocabulary. With that said, there are not the same type of quest mechanisms in a game like Second Life as there are in World of Warcraft, and these quests provide much of the motivation that research has shown games encourage (Barseghian, 2011; Peterson 2010; Rama et al., 2012; Suh et al., 2010). Further research in this area will be able to determine if playing a particular MMOG is more likely to promote language skill development than others.

5.3 Conclusion

The popularity and revenue of commercial video games now rivals and in some instances even surpasses major Hollywood movies. This surge in popularity is being seen across all demographics. While video games are traditionally seen solely as sources of entertainment, their potential use as pedagogical tools is garnering more attention. Specially designed educational

video games have tried to act as a bridge between education and entertainment, but commercial video games have the potential to be pedagogical tools as well. MMOGs are a type of video game that is a relatively recent development and, that together with global high-speed Internet, has created ideal conditions for language learners to interact with L1 speakers. As this area of research is still in its infancy, few studies have examined their potential benefits on the language skills of a learner. The present study was, to my knowledge, the first study that sought to examine the potential benefit that playing an OTS MMOG with a EL1 speaker can have on the accuracy, fluency, and lexical complexity of intermediate-level English language learners by examining the participants' chat logs. It also aimed to gather more in-depth information on the participants' perceptions of using an MMOG as a language learning resource. The findings of the study seem to indicate that playing an OTS MMOG can potentially improve the accuracy, fluency, and lexical complexity of an intermediate-level language learner. All of the participants also indicated positive perceptions to using an MMOG as a language learning resource.

Determining and analyzing the potential benefits that playing an MMOG can have on a language learners' language skills is difficult and subject to many factors such as methodological and the operationalization of the key terms and variables. It is my belief that the results of this study provide some evidence as to the potential benefits that MMOGs can have on language learning and the results indicate that further investigations are a worthwhile pursuit.

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Appendix A

Initial Participant Background Questionnaire

Date:

_____

1. Name:

_____

2. Age:

_____

3. Gender:

Male Female

4. Nationality:

_____

5. Native Language:

_____

6. What is the highest level of education that you have completed? (Ex. high school, college degree, university degree)?

_____

7. How long have you been studying English?

_____

8. If you have another language proficiency score (IELTS, TOEFL, CET), please enter it here

_____

9. Why are you studying English?

_____

Please rate your language proficiency on a scale of 1 - 7 (1 being very low & 7 being near fluent)

10. Listening 1 2 3 4 5 6 7

Very Low Near Fluent

11. Speaking 1 2 3 4 5 6 7

Very Low Near Fluent

12. Reading 1 2 3 4 5 6 7

Very Low Near Fluent

13. Writing 1 2 3 4 5 6 7

Very Low Near Fluent

14. Vocabulary 1 2 3 4 5 6 7

Very Low Near Fluent

15. Grammar 1 2 3 4 5 6 7

Very Low Near Fluent

Appendix B

Pre-Study Participant Video Game Experience Questionnaire

1. Do you play video games?

Yes No

2. If you play video games, which games do you play?

_____

3. During an average week, how many hours do you spend playing video games?

< 1 hour 1-3 hours 4-6 hours 7-9 hours > 9hours

On a scale of 1 – 7 (1 being VERY HELPFUL & 7 being very NOT HELPFUL)

4. How helpful do you think playing a video game can be to learning an additional language?

1 2 3 4 5 6 7

VERY HELPFUL NOT HELPFUL

On a scale of 1 – 7 (1 being impossible & 7 being very likely)

Do you think:

5. That your English listening skills can improve by playing?

1 2 3 4 5 6 7

IMPOSSIBLE VERY LIKELY

6. That your English speaking skills can improve by playing?

1 2 3 4 5 6 7

IMPOSSIBLE VERY LIKELY

7. That your English reading skills can improve by playing?

1 2 3 4 5 6 7

IMPOSSIBLE VERY LIKELY

8. That your English writing skills can improve by playing?

1 2 3 4 5 6 7

IMPOSSIBLE VERY LIKELY

9. That your English vocabulary can improve by playing?

1 2 3 4 5 6 7

IMPOSSIBLE VERY LIKELY

10. That your English grammar can improve by playing?

1 2 3 4 5 6 7

IMPOSSIBLE VERY LIKELY

11. What part of playing video games do you find most helpful to English language learning?

_____

_____

12. What part of playing video games do you find least helpful to English language learning?

_____

_____

Appendix C

Post-Study Participant Questionnaire

On a scale of 1 – 7 (1 being no improvement & 5 being significant improvement)

Since participating in the study do you feel:

1. That your English listening skills improved?

1 2 3 4 5 6 7

NO IMPROVEMENT SIGNIFANCT IMPROVEMENT

2. That your speaking skills improved?

1 2 3 4 5 6 7

NO IMPROVEMENT SIGNIFANCT IMPROVEMENT

3. That your reading skills improved?

1 2 3 4 5 6 7

NO IMPROVEMENT SIGNIFANCT IMPROVEMENT

4. That your writing skills improved?

1 2 3 4 5 6 7

NO IMPROVEMENT SIGNIFANCT IMPROVEMENT

5. That your vocabulary improved?

1 2 3 4 5 6 7

NO IMPROVEMENT SIGNIFANCT IMPROVEMENT

6. That your grammar improved?

1 2 3 4 5 6 7

NO IMPROVEMENT SIGNIFANCT IMPROVEMENT

On a scale of 1 – 7 (1 being not helpful at all & 7 being very helpful)

7. How helpful was playing the video game to your language learning?

1 2 3 4 5 6 7

NOT HELPFUL VERY HELPFUL

8. Will you continue playing video games to help you learn English?

Yes No

9. What part of playing the video game did you find most helpful to learning?

_____

_____

10. What part of playing the video game did you find least helpful to learning

_____

Appendix D

Pre-Study Interview

1. What is your name?

2. Do you play video games?

3. Why/Why not?

4. If you play Video games, what games do you like playing?

_____

5. Have you ever tried playing a massively multiplayer online game like World of Warcraft?

6. Why/Why not?

7. Why do you play video games?

_____

8. Have you ever played a video game in a language other than your native language?

9. Why/Why not?

10. Do you feel it helped you learn the language of the game?

11. Do you think playing a video game can help you learn a language?

12. Why/Why not?

Appendix E

Post-Study Interview

1. What is your name?

Please answer yes or no to the following questions

After playing World of Warcraft with a native speaker, how much do you feel that:

2. Your listening skills improved?

YES NO

3. Why/Why not?

4. Your speaking skills improved?

YES NO

5. Why/Why not?

6. Your reading skills improved?
YES NO

7. Why/Why not?

8. Your writing skills improved?
YES NO

9. Why/Why not?

10. Your vocabulary improved?

YES NO

11. Why/Why not?

12. Your grammar improved?

YES NO

13. Why/Why not?

14. Now that the study is completed, do you think you will continue to play video games to help you learn English?

15. Why/Why not?

16. What did you like about playing the video game with a native speaker?

17. What didn't you like about playing the video game with a native speaker?

On a scale of 1 – 7 (1 being not confidant at all and 7 being very confidant)

18. How confident did you feel playing the game?

1 2 3 4 5 6 7

NOT CONFIDANT VERY CONFIDANT

19. Why/Why not?

20. How confident did you feel communicating during the game?

1 2 3 4 5 6 7

NOT CONFIDANT VERY CONFIDANT

21. Why/Why not?

22. Were there any barriers that you faced when communicating with other players?

23. Did you feel anxious while playing?

24. Why/Why not?

25. Would you recommend video games to other people to help them learn a language?

26. Why/Why not?

27. Is there anything else that you would like to share with me about your experience in this study?

Appendix F

Example of Parental Control Update

This is an example of a parental control update. In this case, the play report was e-mailed directly to my e-mail (as the parent of the account). Here you can see the name of the player account, their e-mail address, the days and times of their log on and log off, as well as a total of the minutes spent playing.

Dear Parent,

The playtime report for your child's account is displayed below:

Game: World of Warcraft®

Game Account:

ross.zariski@gmail.com - WoW1

Playtime for 23 Feb 2013 - 02 Mar 2013 Date/Time of Login Date/Time of Signoff* Minutes Played

23 Feb 2013 06:04 PM 23 Feb 2013 07:04 PM 60

24 Feb 2013 04:14 PM 24 Feb 2013 04:44 PM 29

25 Feb 2013 11:39 PM 25 Feb 2013 11:50 PM 10

25 Feb 2013 11:54 PM 25 Feb 2013 11:59 PM 4

26 Feb 2013 12:05 AM 26 Feb 2013 12:23 AM 17

26 Feb 2013 12:32 AM 26 Feb 2013 12:55 AM 22

26 Feb 2013 12:49 PM 26 Feb 2013 12:57 PM 8

26 Feb 2013 12:59 PM 26 Feb 2013 01:29 PM 30

Your Time Zone: US/Pacific

Total Minutes: 180

*Please allow up to a five minute disparity between the specified time and the actual signoff time.

Regards,

The Battle.net Team

Appendix G

Sample Chat Log

This is an example of a chat log that has been sent from the game as a text file. On the left hand side you can see the month and day, followed by the time stamp, character name, and then the message. Non-player characters or battle text are written in different colors to avoid confusion.

3/2 22:18:35.682 |Hchannel:PARTY|h[Party]|h ESLStudent: What is your quest?

3/2 22:18:38.722 Pluja-Terokkar nods.

3/2 22:19:07.522 |Hchannel:PARTY|h[Party Leader]|h NativeEnglishSpeaker: im just getting it now

3/2 22:19:40.643 |Hchannel:PARTY|h[Party Leader]|h NativeEnglishSpeaker: i just have to walk somehwewe

3/2 22:19:44.363 |Hchannel:PARTY|h[Party Leader]|h NativeEnglishSpeaker: somewhere

3/2 22:20:11.643 |Hchannel:PARTY|h[Party]|h ESLStudent: do you have to kill assasin slain?

3/2 22:21:28.273 Goblin Assassin says: We'll kill anybody for the right price!

3/2 22:21:29.853 Goblin Assassin dies, you gain 24 experience.

3/2 22:21:37.673 Your share of the loot is 3 Copper.

3/2 22:21:42.413 Goblin Assassin says: We're gonna burn this place to the ground!

3/2 22:21:48.203 |Hchannel:PARTY|h[Party Leader]|h NativeEnglishSpeaker: nope, just walk

3/2 22:21:49.533 Goblin Assassin dies, you gain 24 experience.

3/2 22:22:00.473 |Hchannel:PARTY|h[Party Leader]|h NativeEnglishSpeaker: theres this person outisde the castle

3/2 22:22:05.603 Goblin Assassin dies, you gain 24 experience.

3/2 22:22:09.323 Your share of the loot is 1 Copper.

3/2 22:22:18.093 Goblin Assassin dies, you gain 24 experience.

3/2 22:22:29.563 |Hchannel:PARTY|h[Party]|h ESLStudent: who do you find?

3/2 22:22:30.223 |Hchannel:PARTY|h[Party Leader]|h NativeEnglishSpeaker: now i have to kill assassins

3/2 22:22:31.343 Goblin Assassin dies, you gain 24 experience.

3/2 22:22:36.543 |Hchannel:PARTY|h[Party]|h ESLStudent: nice

3/2 22:22:45.073 |Hchannel:PARTY|h[Party]|h ESLStudent: with me

3/2 22:22:49.553 Stormwind Infantry says: I need a heal!

3/2 22:22:51.553 Brother Paxton says: Let the Holy Light embrace you!

3/2 22:22:57.643 Blackrock Spy says: Eat you!

3/2 22:23:01.493 Blackrock Spy dies, you gain 16 experience.

3/2 22:23:02.723 |Hchannel:PARTY|h[Party Leader]|h NativeEnglishSpeaker: ok

3/2 22:23:12.343 |Hchannel:PARTY|h[Party]|h ESLStudent: let;s go