

Language learning in the digital game Minecraft: A mixed methods  
study of Japanese EFL learners

White Jeremy Stewart



## Abstract

オンライン言語学習の普及に伴い，教育実践の場では第二言語学習のツールとしてデジタルゲームが持つ可能性が追求されている。本事例研究では，伝統的な教室環境の限界を超えたハイブリッド教授法を開発することを目的として，商用デジタルゲームである「マインクラフト」上で交わされる日本人英語学習者の文字チャットを混合法により調査した。6名の日本人大学生（男性4名，女性2名）が，1学期間，週に一度の頻度でセッションに参加した。セッションは事前説明3回と事後討議1回を含めて合計11回実施された。参加者は7回のゲームセッションをとおして仮想大学のキャンパスを構築するタスクに取り組んだ。その際，参加者はマインクラフトのゲーム内機能を用いて英語で文字チャットを行った。データは事前・事後に実施した質問紙調査と面談，文字チャットのログ，実地調査記録，行動観察記録により収集した。分析にあたっては学習者を個々の事例として扱うとともに，グループ全体も質的分析の対象とした。タスク遂行中のプレイ行動をRubin (1989) の枠組み (Play Observation Scale) を援用して分析した結果，「グループプレイ行動」と範疇化される社会的行動が最も顕著であった。このプレイ行動は，非母語話者同士が目標言語を用いて意味を構築する社会的インタラクションであったこと，さらに，最近接発達領域における目標言語学習の相互支援であったことから，この種のプレイ行動が目標言語の自律的学習に最も適したものと判断された。語彙の観点からは，学習者が英語における最頻出語彙の上位2,000語レベルの語彙を使用していることが明らかになった。加えて，ゲーム開始当初はゲームプレイ自体の理解に焦点をあてていたものが，タスクの進捗に伴い，より積極的に文字チャットを主導するようになるといった女子学生のプレイ行動の変容も観察された。こうした知

見は、マイクラフトが、最頻出 2,000 語レベルの英語語彙を学習不安が低減された環境下での対話で使用する機会を提供し、学習者のコミュニケーション能力を育成する場として機能していることを示している。本研究をとおして、デジタルゲームを使った学習が、学習動機を高めると同時に目標言語を用いた対話を促すことが示され、教師中心の指導法から脱却し、自律的な目標言語運用能力習得に資することが明らかになった。

## Abstract

As online language learning expands, practitioners are increasingly exploring the potential of digital games as tools for second language learning. In this context, this case study research incorporated mixed methods to investigate the task-based interaction of EFL learners in the commercial digital game Minecraft. This study investigated Japanese university English language learners' written chat interactions when playing Minecraft in English with the ultimate goal of developing a hybrid English language teaching methodology to improve the communicative competence of Japanese English language learners. Six native Japanese undergraduate students, four males, and two females, participated in weekly gaming sessions over one semester. Eleven sessions were conducted, including an information session, two orientation sessions, seven gaming sessions, and one post gaming session. Within the seven gaming sessions, the students interacted in written English using Minecraft's in-game chat function in order to complete tasks. The goal of the tasks was to build a virtual university campus within the Minecraft virtual environment.

Data was collected from pre- and post-research surveys and interviews, weekly written game chat, field notes, and observation. The collected data was analyzed qualitatively as six individual case studies and also as a group to allow for in-depth layers of understanding of the data to develop. For the first time, EFL learner play was analyzed using the Play Observational Scale and this revealed that group play, a type of social play, was the most frequent. In a positive finding, data analysis showed that Minecraft's communication environment and the tasks elicited target language use that enabled students to engage in meaningful social interaction involving collaboration. Data shows that students were exposed to zones of proximal development (ZPD) where they assisted each other during learning, overcoming issues involving usage and unknown target language vocabulary. These are

positive findings, as they indicate the operation of learner autonomy and highlight the feasibility of a move away from the teacher-dominated forms of instruction that prevail in many language classrooms. Concerning vocabulary, the findings showed that students used words from the K1 to K2 level, equating to the 2000 most frequent words in English, positioning them to understand up to 90% of written English text. Interactions within Minecraft's chat function provided opportunities for valuable language practice involving K1 and K2 level target language vocabulary in a low anxiety environment. In addition, this context allowed students to engage in forms of interaction involved in language development such as negotiation. Analysis further reveals that engaging learners in digital game-based learning enhances motivation and appears to improve communicative competence in a manner that goes beyond what can be achieved in many conventional language classrooms. Findings relating to gender highlight that at the beginning of the gaming sessions, the female students focused on understanding Minecraft's gameplay. However, as the gaming sessions progressed, it was found that the female students increasingly became more active than the male participants.

Analysis of learner feedback revealed further important findings relating to game-based learning and specific language skills. Data from pre- and post-gaming surveys suggest that students started this research with inflated expectations related to the perceived benefits of game-based learning on listening, speaking, reading, and writing abilities. The post gaming session survey data indicated that even though student expectations were reduced somewhat, they still maintained positive perceptions in relation to the impact game-based learning could have on their reading and writing ability. An additional positive result was that some students believed the game gave them the ability to use the vocabulary they would not usually attempt in the classroom and that the gaming sessions were enjoyable. In conclusion, taken as a

whole, the findings of this study suggest that engaging language learners in digital game-based learning involving tasks may facilitate aspects of language development and provides a potentially valuable means to move beyond the limitations of the traditional classroom environment.

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## **Glossary**

CALL	computer assisted language learning
SLA	second language acquisition
GBL	game-based learning
COTs	commercial off the shelf games
NNS	non-native speaker
NS	native speaker
TL	target language
ZPD	Zone of proximal development

## 1.1 Introduction to the Research Problem

Japan has a problem: it is trapped in the expanding circle of English influence.

Although there is a desire among some Japanese to be effective English communicators, this has not occurred and does not seem likely to occur. The concentric circle model (Kachru, 1985) depicts three circles of English influence: inner, outer, and expanding, of which Japan currently is located in the expanding circle. The Ministry of Education, Culture, Sport, Science, and Technology (MEXT) focuses on implementing new strategies to move inwards. In April of 2008, MEXT revealed its plans for English to be a compulsory subject from the fifth grade of public elementary schools from April 2011 (The Ministry of Culture, Sports, Science and Technology, 2008a) and from 2020 MEXT moved compulsory education to the third grade of elementary school (Japan Times, 2013a). Compulsory education now involves an extra 4 years of English, bringing Japan in line with its Asian neighbors (Nunan, 2003) and moving language learning into students' critical age window (Fromkin, 1991).

The critical age for learning is the time at which some academics believe that young learners can naturally learn and retain languages, in contrast to older children and adults. Furthermore, a speaking test is slated to be a requirement for the university entrance examination from 2020 (Japan Times, 2013b). A speaking test would be a significant change in a country that focuses primarily on reading and writing over communication ability. The problem is that although this decision to implement compulsory English education has occurred at the bureaucratic level, even now, some years after the start of compulsory English lessons at public elementary schools, the techniques for implementing English education remain vague and poorly implemented. Progress does not seem to have occurred. The increased length of English education coupled with poor implementation means that by the time Japanese students reach university, some can be jaded with English language learning, a

situation that highlights the need for innovative methods to revive student interest in English at the tertiary level.

## **1.2 Objectives of this Research Study**

The importance of English as a test subject in Japan has always been apparent, especially at the junior high school to university level. However, the need for English at all levels of schooling is increasing in Japanese society. Previously, Japan expressed the desire to increase the number of foreign tourists (Zhang and McCornac, 2014), create students with English communicative abilities (MEXT, 2013a), and move inward in the circle of English influence. The first desire has been achieved, with record numbers of tourists coming to Japan in the late 2010s (JTB Tourism Research & Consulting Co, 2019). The latter two are yet to come to fruition. As previously stated, the Japanese government announced in 2008 a reform of the education system to move formal English education into elementary schools from April 2011, 2 years earlier than it had previously (Morita, 2010), from the third grade in 2020 (Japan Times, 2013a) and planned to introduce a speaking test as a university entry requirement from 2020 (Japan Times, 2013b) which has now been delayed until approximately 2024 (Japan Times, 2019).

However, the importance placed on English education to date and the results of commonly used English tests are not aligned. Japanese language learners have consistently scored poorly in relation to their Asian neighbors in many standardized tests such as TOEFL, according to which they were rated 31st out of 36 Asian countries in 2014 (ETS, 2019) and 28th out of 30 in 2019 with six countries (Bhutan, Brunei Darussalam, Christmas Island, Keeling Island, Maldives, and Timor-Leste) not having any test-takers in 2019. The trend here is worrying, as Japan has slipped from being 27th out of 36 in the late 2000s (ETS, 2010) and has been surpassed by several developing nations that do not possess the same financial power. Only Switzerland, Norway, and Denmark beat Japan in terms of the amount spent by



educational institutions per student from elementary to tertiary (OECD, 2012). Standard testing and financial spending results suggest that something is fundamentally wrong with the methodology of English education in Japan. To continue with the same methodology into the future will ultimately, using past achievements as a measure, result in Japan lagging further behind in English communicative competence abilities compared to other countries and will not help in moving Japan from the outer circle of English influence. With English being a lingua franca for international communication (Jenkins, 2014), limitations to communicating effectively in English may have far-reaching implications for their position as a global power.

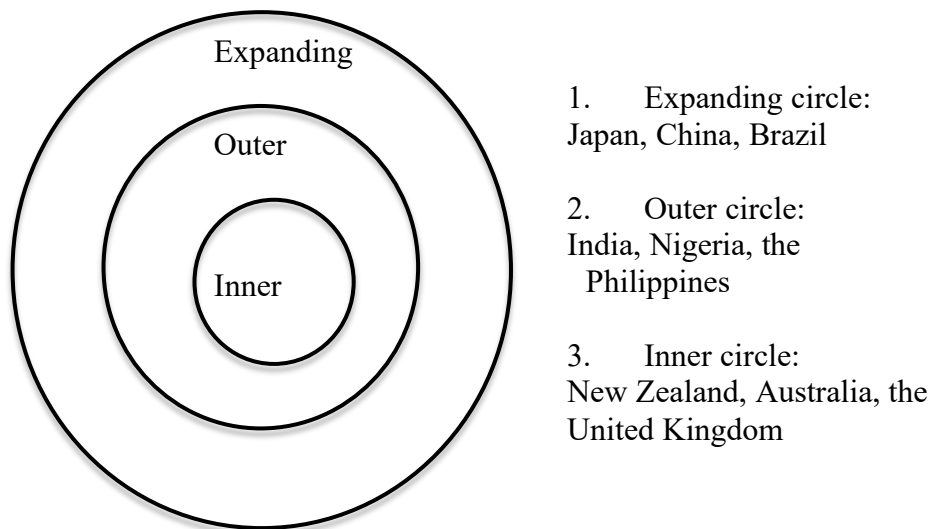
Due to the concerns mentioned above, the current study became necessary. This study aims to identify and explore a new complementary methodology to encourage interaction and play in English and provide potential language-learning opportunities in English at the university level in Japan using a commonly used online game (Minecraft) and an online discussion application (Line). The goal of this research is not to replace the current teaching methodology used in Japanese education. Instead, this research hopes to provide an additional motivational tool to help teachers increase the use and level of English language output through interaction and play. An essential goal of this research is the hope that educators and policymakers' attitudes concerning digital games for language-learning opportunities in the classroom at the university level can be positively changed.

### **1.3 Rationale for the Research**

In Japan, Kachru's three circles of English model is a reference point for Japanese English education (Kachru, 1985). MEXT has expressed a desire to move inward from the expanding circle of English.

## Figure 1

Kachru's Three Circles of English Model (1985)



There are three circles of English influence globally: expanding, outer, and inner circles (Kachru, 1985). Those countries in which English is the mother tongue such as New Zealand, Australia, the United Kingdom, The United States of America, and Canada occupy the inner circle. In these countries, the primary language of communication is English, and it has played a crucial role in building the country's culture. The outer circle of English influence contains countries such as India, Nigeria, and the Philippines. Many of the countries in this band were a colony of one of the inner-circle countries at some point in their history. In these countries, English is not regarded as the mother tongue but is an asset. English is often used as the language for formal schooling and as a means for socio-economic class distinction. English in this circle can even provide a way for those with different native languages within a country to communicate with each other. The expanding circle, of which Japan is a member, comprises countries with no historical background of English. In these countries, English is a means of international communication. English may or may not be the formal language used for education but is often studied formally at school. The current policy

of MEXT would suggest that the Japanese government is playing an active role at a policy level to do what it believes will move Japan into the outer circle, emphasizing the importance of English and introducing it as a compulsory school subject from elementary school to increase the likelihood that it will become an asset.

This need for English as a communication tool has been reinforced by the stated desire of several major companies in Japan to make English their "official language" at the management level from 2012 (Daily Yomiuri Online, 2010). This decision has caused some surprise, ridicule, and panic from other companies, company employees, and the general public. The justification given by the companies who have implemented an English only policy is that they realized they would need a workforce who could speak English, to at least at a communicative level, if they wanted to survive the ever-shrinking domestic market, which will see the population of Japan decrease from 128 million in 2010 to a predicted 86 million in 2060 (Japan Times, 2013b) and expanding their operations overseas. The employees of these companies had realized that the language some of them they tried hard to avoid speaking when they were at school, or have not used since their formal schooling finished, is a prerequisite for them to move up on the corporate ladder. Companies have openly and unapologetically stated that new graduates with English language proficiency or experience studying abroad would be given preferential treatment in the recruiting process compared with those with none (Daily Yomiuri Online, 2010).

Evidence suggests some companies have already begun this process as from 2009 to 2011, the number of companies who hired recruits with English abilities increased from 16% to almost 50% (Katsumura, 2011), although just what constitutes English abilities remains unknown. In addition, the majority of the standardized tests used as a measure of English ability for these companies contain no speaking element. Feedback from Rakuten employees some 10 years after implementing "Englishnization" (Japan Times, 2018) suggested that

while there had been some resistance and difficulty, Rakuten had also had some success in achieving its goal. Besides the corporate world, the general public and government in Japan have been one of the world's biggest spenders on English education. Even with an economy that has been in a constant state of recession or near-recession circumstances, the foreign language market in Japan continues to grow with a total increase of 1.6%, to \$9.8 billion (US) in 2010. One prominent online English language-learning company in Japan reported a three-fold increase in profit in the 2000s (Katsumura, 2011), giving some insight into the Japanese public's desire to improve their foreign language skills.

As previously mentioned, this spending did not have the desired results for Japan based on standardized testing results such as TOEFL. In 2010 Japan was ranked 27th out of 36 Asian countries behind countries with minimal economic resources such as Mongolia and Turkmenistan (ETS, 2010). In 2011 Japan dropped to 28th position, just above Cambodia and the People's Republic of Lao (ETS, 2012). In 2014 Japan fell to a lowly 31st position, equal with Mongolia, and in 2018 its closest rival was Tajikistan (ETS, 2019). Discouragingly, the number of Japanese students who take the opportunity to study abroad has dropped by over 50% since the mid-1990s as the result of several factors, including the cost of studying abroad during a recession, the inability to transfer credit from foreign universities, the need to continue to pay student fees in Japan when studying abroad, and the emphasis placed by Japanese businesses on gaining a degree from a Japanese institution (Ligro, 2012; MEXT, 2015). In response to the need to be more international, MEXT has, in recent years, initiated concepts aimed at encouraging more foreign university students to study in Japan and Japanese university students to undertake short-term language and cultural studies in foreign institutions (MEXT, 2013). The "Global 30" and "Super Global" programs in Japan have a goal of making Japan a "leading international hub" (Japan Society for the Promotion of Science, 2011). While this concept appears to be a worthwhile cause, it means that valuable

resources are being taken away from English education at the elementary school level. MEXT does not seem to focus on a single concept for any period, which in this instance is a detriment to English education at the elementary school level. An additional driving factor at becoming more global may well have been the advancement of China and South Korea, Japan's closest neighbors and economic rivals, who have seemingly surpassed Japan in both English levels and in economic power in the case of China. Indeed, the 2011 TOEFL test results show that Korea and China have a significantly higher test score than Japan (ETS, 2012, 2019).

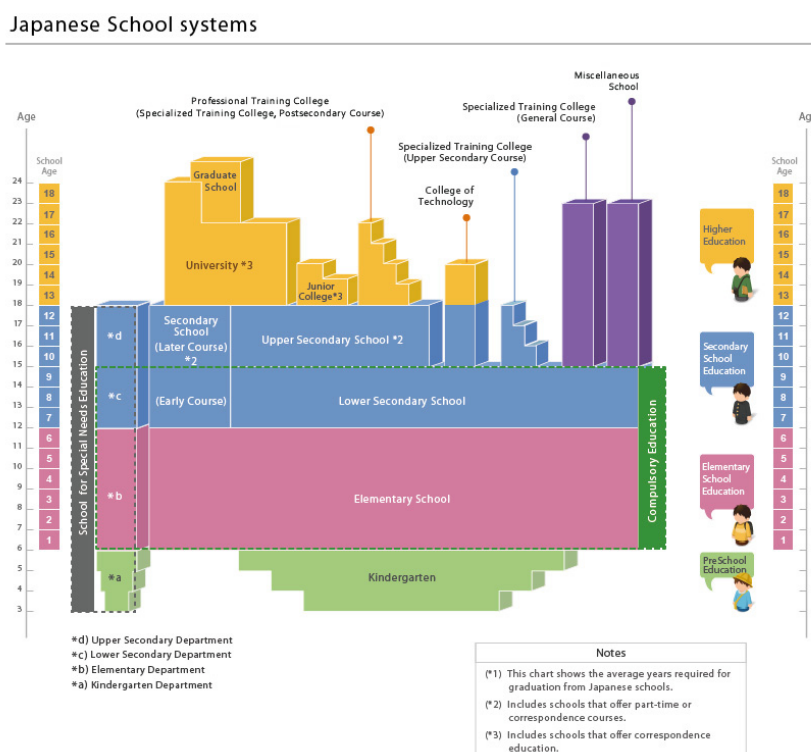
Understanding the Japanese education system is can be challenging. First, it is necessary to comprehend the role of MEXT. MEXT is the sole body that informs the government on curriculum standards for all levels of schooling until university and prescribes the exact content of each subject at each level. This body develops and approves textbooks for subjects at the elementary to high school levels, with unauthorized textbooks strictly forbidden, which is a top-down approach to policy development (McVeigh 2005, 2006; Stewart, 2008; Tamamoto 2009). To ensure schools meet curriculum goals, local boards of education work with MEXT, monitoring the situation at each school and reporting directly back to MEXT. Being a top-down system, feedback on the curriculum is often not undertaken. Thus, MEXT suggests changes to the curriculum based on what it believes is best for Japanese schools' education, frequently disregarding teachers' opinions. In 2008, through MEXT, the Japanese government produced a white paper that outlined its vision for Japanese schools over the following decade (MEXT, 2008b). This vision included the implementation of English in public elementary schools from April 2011. The paper suggested that Japan develop a society with English communicative abilities but did not suggest that fluent English speakers were necessary. There are no clear guidelines as to the criteria for a society with English communicative abilities or whether these abilities refer to listening, speaking,

business, leisure, or something else. The lack of clear guidelines has led to a situation in which teachers interpret the goals differently to MEXT, trying to please parents, school administrators, and students who have a different agenda concerning education (Stewart & Miyahara, 2011). The lack of clear guidelines has not improved with further updates to the English educational system, including introducing an English-speaking test for the university entrance examination, but few details on the test administration are available.

Below, Figure 2, is an illustration of the education system in Japan. There are six years of compulsory elementary school education, three years of compulsory middle school education, and three optional secondary school education years. Whether English is a compulsory or optional subject at the tertiary level is dependent on the major, although many universities do require one to two years of English language study. Since the end of World War II, Japanese language education has one aspect in common at all the levels, a firm focus on the grammar-translation method (Richards & Rodgers, 2014).

**Figure 2**

*Japanese School System (MEXT, 2015)*



This method of instruction is teacher-centered, where teachers lecture and students listen. Instruction of this type is not likely to create a society with English communicative abilities, the stated goal of MEXT, but helps students pass examinations, and meets schools, teachers, and parents' perceived goals. Students need to pass examinations in order to be able to proceed to the next level of education. In the hopes of entering a higher-level institution, students often go to after-school schools, or cram schools, called "juku" in Japanese. At a juku students can focus on improving their academic ability in critical entrance test subjects, although the fees to attend juku can often be hefty. If a student can pass a test for a high level and famous universities such as Tokyo or Kyoto University, then the chances of being recruited by a significant national or international company increase dramatically. While there seem to be many negatives in the Japanese education system, there are also some positives with close to 100 percent of students completing elementary and secondary school education. In addition to this, 70 percent of secondary school graduates begin higher education (MEXT, 2009), meaning Japan has a literacy rate close to 100%, one of the highest in the OECD.

All the English tests that students need to take to gain entry to junior high schools, high schools, and universities are written examinations. At no time has there been a test of English communication abilities. Realistically, it would be near impossible for individual institutions to interview all examination takers in English, as the number of test-takers at some institutions could easily number in the thousands. Thus, English communication has not been held in high regard at any level, because it will not help students advance to a higher-level institution. In addition, teachers are bound to feel a high level of pressure to ensure students focus on English education aspects that will best reflect on the school's results. However, with the policy change introduced by MEXT, it seems likely that English communication tests may come sometime after 2020. The logistics of introducing such tests seem difficult to overcome. However, as there is a need for Japanese students to increase their

spoken English communication competence, enforcing a spoken English test may be the only way to compel students to focus on spoken English communication competence.

The use of textbooks as an authority in Japanese education leaves the teachers with little opportunity to show initiative. Textbooks at the university level can usually be selected by the department, while at public elementary to high school, they are made and produced by the central body MEXT. Historically Japan did not use the top-down approach. In the Edo period, the elite samurai class led Japan, literacy was relatively high for the time, and teachers were the source of knowledge, passing on their own experience to students. In the Meiji period, a centralized body like MEXT existed, but with a curriculum modeled on the West. Nowadays, Japan is a developed country and is arguably more political and economically stable than some Western countries. Its educational system mirrors the West, but the curriculum content is sourced solely from one national body. The lack of freedom teachers have in deciding the curriculum means that students' different learning styles are not catered to in the current environment. Thus, while this centralistic style may benefit some students, others are suffering. What is clear from the above is that remaining on the current path is almost certainly going to have little to no effect on the English communicative competence of Japanese language learners. It is time for Japan to investigate alternative and complementary methods of English language learning. This research project, which investigated the use of game-based learning (GBL) in the Japanese higher education context is one such alternative that could assist in achieving the English communicative goals Japan has set for itself.

#### **1.4 Research Questions**

In line with the need to assist Japan in achieving its English communicative goals in language education four main research questions were developed to investigate GBL in the Japanese higher education context:

1. Does task-based interaction in a COTS digital game facilitate TL vocabulary use?



2. What differences in in-game interaction are observed between male and female participants?
3. How does student perception of GBL develop during the research period?  
Furthermore, what are the reasons for the changes (if any)?
4. What potential opportunities presented through the gaming sessions, if used in a traditional classroom setting, could improve TL use?

### **1.5 Significance**

As was observed previously, Japan's situation is very conflicted; MEXT wants to move to the outer circle of English influence. However, the education system does not support this goal. MEXT, dissatisfied with the current status of English language abilities, made the decision to implement a curriculum change to create a society with English capabilities, hoping to create a community with English language communicative abilities, improve standardized test score rankings, and move to the outer circle of English influence. In addition, MEXT wants to bring the Japanese English language curriculum in line with its Asian neighbors, many of which start English education at age six (Nunan, 2003).

It is evident that the dominant grammar-translation method has not created a society with English communicative abilities. Thus, there is a need to look for new methodologies for promoting students' learning that can work in conjunction with the current methodology and curriculum. The researcher anticipates that this research's findings will prove valuable to a variety of interested parties. First, MEXT will be interested in this research as there is currently very little published literature on the implementation of GBL at the university level in Japan. This research will further provide a fresh perspective concerning current and future English language teaching methodologies and curriculum design at universities and highlighting the advantages of GBL as a legitimate curriculum choice.

This research may also benefit teachers, who, until now, have had to depend on more traditional means of instruction while enviously observing other countries who are already enjoying the benefits of GBL. This research may also help teachers recognize the benefits of becoming more confident and comfortable using new classroom tools for student learning. Teachers may also find that this research will allow them to design a curriculum based on video games, providing students with enhanced opportunities to interact and play. In the process, mastering TL and social skills. Students will benefit the most from this research by interacting and playing while learning. These positive experiences could create an interest in English and may assist in the development of English communicative abilities.

### **1.6 Thesis Outline**

A brief outline of this thesis will now be presented to assist the reader in understanding the goals of the research. Chapter two will examine relevant literature related to the research. This chapter starts with an introduction to the history of Japanese education with a particular focus on the influence of educational policy from 1945 to the current day. This chapter will further outline the importance of English education in Japan and how policy and attitudes towards English education have developed in modern history. The chapter goes on to discuss the concepts that have influenced this research including play, Japanese play, computer-assisted language learning (CALL), mobile learning (M-Learning), mobile-assisted language learning (MALL), and second-language acquisition (SLA). With all of these concepts, the author starts by discussing the idea in general before highlighting how they apply to the Japanese context. Chapter two will also discuss the idea of game-based learning (GBL), video games and how they it has been implemented in second-language learning, with a focus on interaction and vocabulary acquisition. In addition, it will also provide a discussion of gender in relation to video games and the use of chat functions. This chapter concludes with an examination of tasks and how they are implemented. Chapter three will discuss the

design of the research project, including a discussion on why a mixed-method methodology was selected. The approaches used to collect and analyze the data will also be addressed. Moreover, this chapter will provide a detailed discussion of the background and attitudes of each participant in this research.

Chapters four to six will provide the reader with an analysis of collected data. Chapter four will analyze play using the Play Observation Scale (POS). The POS has been designed to measure play by dividing play into three categories, social play, cognitive play, and non-play behavior. Once the type of play is determined for the individual case study the implications of that categorization will be outlined. This will be followed by an analysis of play as a whole and finally an investigation into the differences in play between the male and female students. Chapter five, the second of the data analysis chapters will examine the Minecraft in-game chats of students to demonstrate how completing tasks in Minecraft and chatting in written English may have supported language acquisition. As with chapter four, this chapter will at first analyze the data on an individual case study level before a second analysis of the group is conducted. This chapter will conclude with an analysis based on gender. Chapter six is the third of the data analysis chapters. In this chapter the researcher will highlight how vocabulary is used in the gaming sessions and the affordances that games provide to vocabulary learning. This chapter analyzes vocabulary use using K-levels on an individual level to investigate what effect games and interaction might have on vocabulary usage. Chapter seven will analyze the pre- and post-gaming session perceptions students possess in relation to GBL and how these perceptions could affect the possible implementation of games into a hybrid classroom in the future.

Chapter eight will be devoted to a discussion of the research questions. The discussion will look at the data from the analysis chapters and the literature presented in chapter two to make some conclusions on the future direction of GBL in the Japanese educational context.

Chapter nine is the final chapter. This chapter will reiterate the reasons for the current research and highlight how this research has contributed to the field of GBL. Chapter nine will conclude with a look at the limitations of the research and finish with a discussion on the concept of a hybrid classroom that uses both traditional teaching methods and GBL to aide students in increasing their communicative competence.

## **Chapter 2: Review of Literature**

Chapter two will provide a discussion of the literature relevant to this research. This literature will provide the basis for discussion in later chapters. The chapter will begin with an examination of the modern history of Japanese education. The discussion then will move on to examine important concepts that play a central role in this research.

### **2. 1 History of Japanese Education**

To comprehend Japan's educational system, an understanding of Japan's history is essential. Each period in Japan history has had a distinct influence on the education system. The curriculum, learning, teaching, and assessment in Japanese schools have changed dramatically over the past four centuries due to the influence of external and internal factors. The Edo period, from 1603 to 1868 (Dore, 1965), was a time when Japan closed its borders to the outside world, was relatively peaceful, and saw the beginnings of a daily education program (National Institute for Educational Research, 1978). The Meiji period, from 1868 to 1945 (Jansen, 1995) was a "radical departure" (Okano & Tsuchiya, 1999, p. 14) from education in the Edo period when the national school system began and from 1945 to the current day, the education system has been built around that imposed on the Japanese during the American occupation (Murata & Stern, 1993). This period is outlined in more detail below.

#### **2. 1. 1 1945 - Present Day**

The most relevant period to this study is the current period, and thus this will be expanded on in more detail. The US occupation forces took control of the Japanese education system in 1945, at a time when education all but ceased to exist because of World War II (WWII). The occupying forces with the newly appointed Japanese government proceeded to build an education system founded on nine years of compulsory education (Murata & Stern, 1993) (MEXT, 2001). Post-WWII Japan has a very centralized system of education enforced

by local governments and overseen by MEXT. As a result of this, MEXT is solely responsible for developing the curriculum for elementary, secondary, and high school. In addition to this, it has the final say over all university curriculum. As such, MEXT periodically produces a *white paper* (MEXT, 2008a), a directive on how to teach a new or revised curriculum. These white papers are developed together with politicians, and teachers from each level of education, although the final say still belongs to MEXT. MEXT is also solely in charge of developing, publishing, and reviewing textbooks for public school use, which Okano and Tsuchiya (1999) point out is a controversial issue with neighboring countries such as Korea and China, as these countries assert that some significant historical events are misrepresented to favor Japanese interests.

In the 2003 white paper, MEXT committed to administering compulsory English as a foreign language (EFL) from the 5th grade of public elementary school. This is two years earlier than previously administered, and the first time English as a foreign language (EFL) education had been made a compulsory subject at the public elementary school level in Japan. The policy from 2020 now includes EFL education from the 3rd grade from 2020 (Japan Times, 2013a). Previously EFL education began at 12 years of age, 6 years later than Vietnam, Taiwan, and Hong Kong, five years behind Malaysia, and three years later than China and Korea (Nunan, 2003).

While the comparative late start to EFL education may be a possible explanation for Japan being at the bottom of Asian countries in terms of formal test scores (ETS, 2010, 2012, 2019), age is not believed to be the only factor. Nunan's review of English education policies around the world stated that "Anecdotal evidence suggests that governments around the world are introducing English as a compulsory subject at younger and younger ages, often without adequate funding, teacher education for elementary school teachers, or the development of curriculum and materials for younger learners." (Nunan, 2003, p. 112). Nunan believes that

Japan, or any other country introducing English at the age of ten or younger, will make no impact on the level of students if issues relating to adequate funding, teacher education for elementary school teachers, or the development of curricula and materials are not met.

Nunan's reservations mirror findings of a meta-analysis conducted by McVeigh (2004) that highlight negative beliefs toward early English education possessed by some, including such comments as "Panel warns against early English study" (2004, p. 220). McVeigh makes the noteworthy comment that post-WWII era children, more commonly rereferred to as boomers, have become today's politicians with a "nationalist view" (McVeigh, 2004, p. 218) in regards to curriculum development of all subjects, including English. McVeigh provides evidence for this somewhat controversial position by highlighting the attitude of one prominent politician who believes that English education is only necessary for a single percent of Japanese, and that the rest will "do just fine" (2004, p. 218) without it. Some politicians who have a similar way of thinking believe the purpose of learning English, and thus the curriculum of English education in Japan in general, should be expressed concerning the goals of Japan, which may lead to the elitist conclusion that only a select few need learn English (Childs, 2001). This formality and need for a centralized structure differ significantly from the idea of playing as a means of learning. The concept of play on a universal level and play specifically related to Japan will be discussed in the next section to provide some background on how a more playful learning environment could be of benefit to Japanese English language learners.

## **2.2 Imaginative Play**

The concept of play has an essential role in this research. Huizinga (1955) was one of the first to conceptualize play and defined it as:

“An activity which proceeds within certain limits of time and space, invisible order, according to rules freely accepted, and outside the sphere of necessity or

material utility. The play-mood is one of rapture and enthusiasm and is sacred or festive in accordance with the occasion. A feeling of exaltation and tension accompanies the action” (Huizinga 1955, p. 132).

Play is crucial for cognitive development (Csikszentmihalyi, 1990; Provost, 1990) and is fundamental to the processes of stabilization that are "essential for the development of cognitive structures" (Rosas & Cumsille, 2003). "Research provides more and more evidence of the positive effects that well-developed play has on various areas of development, such as social skills, emerging mathematical ability, mastery of early literacy concepts, and self-regulation" (Leong & Bodrova, 2012). Caillois, believed he could define play through the rubric division of play (Caillois, 1961, pp. 13-26). These play divisions included agon, alea, mimicry, and linx, which were based on the nature and role of play:

- Agon: competition and competitive struggle, as seen in chess or football matches.
- Alea: Submission to the fortunes of chance, roulette, or lotteries.
- Mimicry: role-playing and make-believe play.
- Linx: vertigo and physical sensation, an activity which is favored by what we now call adrenaline junkies (Salen & Zimmerman, 2004, p. 335).

Sutton-Smith (1997) goes further and presents the idea that play's ideological concept can be both progressive, the stimulus for moral, social, and cognitive development; and frivolous, being idle and rejecting what is considered a social norm of the work ethic. Sutton-Smith (1997) suggests that when play is viewed from an educational perspective, it is portrayed as progressive. The progressive nature of play for education allows for measurable increases to be observed over time, an essential aspect for policymakers looking for a solution to engagement issues in the current educational setting. However, Sutton-Smith (1997) suggests this perspective "tends to omit some of the nasty, brutish, frivolous, conflictual, of



play...". (p. 84). Play can be brutal, and this brutality can occur in both the physical and digital sense.

Formal measurements of play have been in existence since Parten's (1932) research on the formulation of social patterns, which was followed by Piaget's (1962) children's play behavior research. From these works, the Play Observational Scale (POS) (Rubin 2001) was produced. POS in this study will be used to measure the play of students using a common online game and interacting together through an online chat application while completing set tasks. POS "represents an attempt to relate the two long-standing play hierarchies" (Rubin 2001 p.2), and has been used in a number of studies to determine:

A: age and sex differences in children's play

B: social economic status differences in play

C: effects of the ecological setting of play

D: individual differences in play

E: the social contexts within which the various forms of cognitive play are distributed

Play, when measured using POS, can be coded using the categories described below (Rubin, 2001). Although these categories were developed for the physical world, they may be adapted for the virtual world.

#### 1. Social Play

- Solitary Play: The participant plays apart from the other participants at a distance greater than one meter. The participant is usually playing with games/instruments that are different from those of the other participants. The participant is centered on his/her own activity and pays little or no attention to any participant in the area. If the participant is playing in a small area, the one-meter rule is not often applicable. In such cases, the observer must rely upon the participant's relative attentiveness to others in his/her social group.

- **Parallel Play:** The participant plays independently; however, the activity often, though not necessarily, brings him/her within one meter of other participants. If the participant is very attentive to others while playing independently, parallel play is coded regardless of the distance between the focal participant and the other participants. S/he is often playing with games/instruments similar to those that the participants around him/her are using. The participant usually seems to be somewhat aware of and attentive to his/her other participants, and frequently engages in parallel speech. That is, the participant plays beside his/her companions but not necessarily with them.
- **Group Play:** The participant plays with other participants, and there is a common goal or purpose to their activity. They may follow one another in functional activities, or they may be organized to make some material products, striving to attain some competitive goal, dramatizing situations of adult or group life, or playing formal games. Whatever the activity, the goals are definitely group centered.

## 2. Cognitive play

- **Functional Play:** This is an activity that is carried out to enjoy the physical sensation it creates. Generally speaking, the participant engages in simple motor activities.
- **Constructive Play:** Manipulation of objects to construct or create something. In this context, breaking blocks within a game for fun would be a sensory experience and considered functional play; however, breaking blocks to make a structure within the game is coded as constructive. Therefore, one significant distinction between functional and constructive activity concerns the participant's goal during play. Constructive play may also manifest itself as teaching another how to do something. This differs from exploration because the participant already knows how to perform

the task. For example, the target participant shows another participant how to use coal and sticks to create lanterns.

- **Exploration:** Exploratory behavior is defined as a focused examination of an object to obtain visual information about its specific physical properties. The participant may be examining an object on his/her screen or maybe looking at something from across the room. Also, if a participant is listening for noise or listening for something his/her behavior is coded as exploratory. This behavior has been nested within the social play categories because it can occur in solitary, parallel, or group situations. Generally, reading is coded when a participant reads or scrolls through a text or is being read to by a teacher or other participant. Reading, or being read to, is considered a constructive activity.
- **Dramatic Play:** Any element of pretense play is recorded as dramatic. The participant may take on someone else's role or may be engaged in pretend activity (e.g, pouring pretend water into a cup and then drinking it). He/she may also attribute life to an inanimate object.
- **Games-with-rules:** The participant accepts pre-arranged rules, adjusts to them, and controls his/her actions and reactions within the given limits. The participant and/or his/her playmate(s) before the game's onset may have decided upon these rules. There must be an element of competition between the focal participant and other participants, or within him/herself.

### 3. Non-play behaviors

- **Unoccupied behavior:** there is a marked absence of focus or intent when a participant is unoccupied. Generally, there are two types of unoccupied behavior: 1) the participant staring blankly into space; or 2) the participant is wondering with no specific purpose, only slightly interested, if at all, in ongoing activities. If the

participant is engaging in a functional activity, this is not attending the activity, so the participant is coded as being unoccupied.

Also, a participant may be surveying the place of play. At first glance, it may look like the participant is unoccupied. However, the participant may be visually exploring his/her environment. It is essential to distinguish between truly without focus, and actually looking at something which could be represented as exploratory behavior.

- Onlooker behavior: When on-looking, the participant watches the activity of others but does not enter into that activity. S/He may also offer comments to other participants but does not become involved in the actual activity.
- Transition is coded when a participant sets up a new activity or moves from one to another.
- Active Conversation: Conversation involves the verbal transfer of information to another participant. Parallel and private speech does not fall under this category as neither represents attempts at communication. The conversation is coded when a participant is being spoken to by another participant and is actively listening in order to respond or follow directions. However, a participant who is listening to someone else's conversation but is not explicitly being spoken to is coded as engaging in onlooker behavior instead of conversation. Conversation with a peer is differentiated from a conversation with a teacher.
- Aggression: Aggression refers to non-playful agonistic interaction with another participant. Included are hitting, kicking, grabbing, and threatening.
- Rough-and-tumble: This is a specialized type of play that involves mock fighting, running around in a non-organized fashion, or playful physical contact. This could be viewed in the real and/or game world.

- **Hovering:** Hovering behaviors often begin as on-looking. However, hovering is on-looking at very close proximity to the activity the focal participant is watching. A participant who is watching another and approaches within one meter and frequently appears to want to join in play, but is wary of doing so, is coded as hovering.
- **Anxious Behavior:** Behavior indicating anxiety, including crying, whining, and nail-biting. Anxious behaviors include auto-manipulatives such as hair twisting, foot wiggling, and nail-biting. Participants displaying these types of behaviors would be double coded as anxious.
- **Uncodable behavior:** Uncodable behavior is when one of the following occurs. A) The observer is unable to see what the participant is doing. E.g., the participant is offcamera for an extended period of time. B) The participant leaves the room due to circumstances beyond the control of his/her will. E.g. she has to go to the bathroom.

### **2. 2. 1 Japanese Play**

The above ideas relate to the universal concept of play and have defined how play was measured in this research. However, as this research was conducted in Japan it is important to investigate the potential differences between universal play and Japanese play which may have some impact on the current research. Japan has its own brand of unique play "based on the behavior that is set apart from the ordinary by the availability and division of time" (Cox, 2002, p. 169). Traditionally, play was 'allowed' in *hare*, or sacred time, a time when festivals took place and the entire community was at play as one. This form of play relates most closely to Huizinga's aforementioned definition of play and goes some way as to explaining why Japanese education is so structured. With regards to Caillois's rubric, Yanagita Kunio (1989) defined two types of play; *ikoi*, active (*de suru*) and *yasumi*, passive (*de aru*), the former being agon, and the latter alea. Yoshida Mitsukuni (1985) refined Caillois's rubric to consider the uniqueness of Japanese in celebrating seasons, called play of seasons, to include

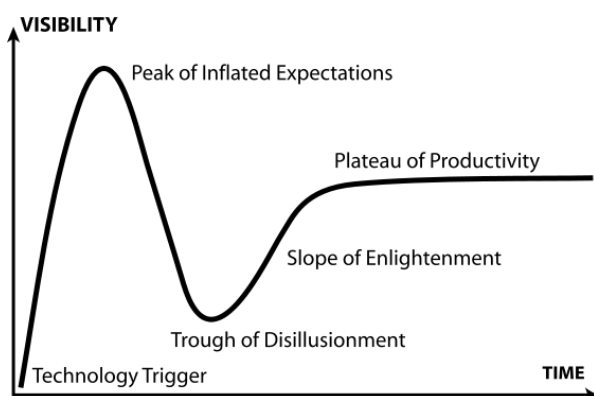
such activities as moon viewing and flower arranging. Cox (2002, p. 171) poses the question of whether the Japanese play at all as Japanese students have been likened to robots, with limited ability to play freely without instruction. This perception sparked MEXT to introduce a range of methods, including making play time at the elementary school level more structured, which severely contradicts the definitions of play. As shown from the literature English education in Japan is not currently play-based. Thus, this research project is distinctive in that it is actively encouraging students to play as a possible means of learning a language. Further to this, the participants played in a digital world, which, to date, is uncommon in informal learning environments. As the students used the digital world for their language learning it is necessary to understand what this means and how students are able to develop their language skills through the use of technology. The next section will review language learning through the use of technology firstly from a historical context and then specifically related to Japan.

### 2.3 Computer Assisted Language Learning (CALL)

A second central theme in this current study is that of Computer Assisted Language Learning (CALL). A brief history is outlined below, the significance of which can demonstrate where this current study falls in relation to CALL and demonstrate that CALL to date has had many false dawns (Peterson, 2013) and hype cycles (Gartner, 2008).

**Figure 3:**

*Gartner's 2008 Hype Cycle*



Davies (2007) states that for over 50 years, as early as the 1960s, computer-based technologies have been used in the educational setting. In the early period, computer use in education was known as computer-assisted instruction (CAI) dominated by mainframe-based computer systems such as PLATO (Programmed Logic for Automated Teaching Operations) (Peterson, 2013). PLATO is the first technology to be considered as a technological trigger in the hype cycle (Gartner, 2008).

Such CAI was behavioristic in its approach with a mainframe computer connected to multiple student terminals, allowing for a vast number of students to learn at their own pace (Butler-Pascoe, 2011). The ability to teach a vast number of students simultaneously meant that PLATO quickly moved to what Gartner (2008) calls the peak of inflated expectations. This system proved fruitful for multiple-choice-based grammar and vocabulary drill activities, and during its operation, it created a significant database of usable material for the teaching of foreign languages. However, the system began to plateau with the withdrawal of federal funding, which proved to be its downfall (Ahmad, Corbett, Rogers, & Sussex, 1985).

As the use of PLATO was declining, a new technology trigger, multimedia CD-ROMs, became the favored foreign language instructional method, as computers with CD-ROM drives, sound cards with high-quality audio, color graphics, videos, and more user-friendly interfaces became readily available (Iwabuchi & Fotos, 2004). Around this time, the concept CALL was coined, and the second peak of inflated expectations reached. CALL was presented as having great potential for foreign language learning. The difference being PLATO and new CALL technology was that PLATO focused on drills to engage the user (Philips, 1987). In contrast, CD-ROMS attempted to complement Second Language Acquisition (SLA). They allowed for exposure to comprehensible input and immediate feedback (Krashen, 1985; Long, 1985), allowing for enhanced learner autonomy (Brett, 1998) lacking in PLATO system. The 1990s were a boom period for the development of CALL

CD-ROMS, with positive results reported in relation to the retention of new vocabulary (Chun & Plass, 1996), enhancing listening comprehension (Brett, 1997), improved grammar knowledge (Felix, 2000), and increased learning motivation (Fleta et al. 1999). CD-ROMS moved through the trough of disillusionment as limitations were still becoming apparent. Many teachers chose not to use the available CD-ROMS, due to a belief that they did not meet students' needs (Hlas & Vuksanovich, 2007), as the content could not be modified (Chamber & Bax, 2006), and the cost and development lead time (Brett & Nash, 1999).

CD-ROMS like PLATO saw a plateau of productivity with the beginnings of the World Wide Web in the 1990s, the third technology trigger in the history of CALL. At this time, Computer-mediated communication (CMC) was expected to revolutionize language education as traditional constraints on the learning process such as time and distance could be reduced (Waschauer, Turbee, & Roberts, 1996), again a peak of inflated expectations occurred. Video conferencing, a form of CMC that provides exposure to comprehensible input from peers in real-time, presented opportunities to negotiate meaning in the production of the TL, which is reported to be essential in raising learner awareness and enhancing language acquisition (Swain, 1985). Learning through CMC gave learners unprecedented access to peers from around the world, increasing opportunities to develop their intercultural knowledge and communicative competence (O'Dowd, 2000). While the positives of CMC included increased motivation and confidence (McAndrew, Foubister, & Mayes, 1996), active TL collaboration (Wong & Fauverge, 1999), and exposure to the TL culture (O'Dowd, 2000), several issues were also identified. These included development costs, hardware requirements, and the need for a stable network structure (Hampel, 2003; Perkins, 1999). Like PLATO and CD-Roms before it, video conferencing over the web has moved through the stages of the hype cycle. Digital games for language learning, the focus of the current study, have also moved through the hype cycle and is currently between the peak of inflated



expectations and trough of disillusionment (Simoes, 2014). The following section will continue the exploration of CALL but will specifically highlight the development of CALL in the Japanese context.

### **2.3.1 CALL in Japan**

The stereotype of Japan as a nation at the cutting edge of technology, able to negotiate any digital-related issue with ease. However, this is far from the truth, especially concerning the adoption of technology for educational purposes where Japan lags well behind other developed nations (Aoki, 2010; Latchmen, Insung, Aoki, & Ekrem, 2008). MEXT (2013) is aware of the issue, suggesting that while literacy skills have been taught effectively, 21st-century literacies, such as digital literacy, have not. The solution to this issue seen by MEXT is using ICT to develop these critical skills (MEXT, 2013). In the 1990s, Japan saw the need for teachers to become computer literate and made it compulsory for all students training to be teachers to take a two-semester course on computer basics (Santiago, 1993). A small survey of both Japanese and foreign language instructors conducted by the author (White, 2011) in relation to CALL in the Japanese university education system found that CALL was on occasions forced on teachers via a top-down decision-making process based on convenience, without any thought to the teacher's competence with computers, little to no training of the software used, and a lack of technical support (White, 2011). While CALL relates to all computer-based language learning, the continued advancement of technology has allowed for more specific sub fields to develop. Two of these fields, which relate to gaming, mobile-learning and mobile assisted language learning will be reviewed in the next section with specific focus on the Japanese context.

### **2.4 Mobile-Learning**

Mobile learning (M-learning) is still a relatively new field in education (Jones & Jo, 2004) and even more so in Japan. As such, M-learning currently has no agreed-upon

definition (Kukulska-Hulme, 2006). However, for this research it will be assumed that the language learner is the mobile entity and not the device or location used for learning.

The vital difference is that "mobile technology, while essential, is only one of the different types of technology employed. The learning experiences cross spatial, temporal, and/or conceptual borders and involve interactions with fixed technologies as well as mobile devices" (Kukulska-Hulme, Sharples, Milrad, Arnedillo-Sanchez, & Vavoula, 2009, p. 20). Even with this distinction, it is difficult to remove the importance of mobile devices in education at present. As early as 2005, reports suggested that mobile devices such as Nintendo DS and Portable Playstations could be found in most Japanese homes (Niizimi, 2005). In the early 2010s, it was estimated that some 33 million Nintendo DS, 6 million Nintendo 3DS, and 19 Million Portable Playstations had been sold in Japan since mobile devices became readily available in 2004 (Atkinson, 2012). In addition to this, there are currently 127 million cell phones in use in Japan, with 98% of those being 3G enabled (Budde, 2012). The smartphone boom, which started in Japan in 2009 (White & Mills, 2012), has also dramatically increased these devices' functionality, further blurring the distinction between the mobility of learners and devices. The increased availability of mobile devices has led to the coining of the acronyms, BYOT(D), or bring your own technology (device) (Quillen, 2011). As the name suggests, students must bring their own mobile device to school, saving the school the expense of providing and maintaining expensive computer laboratories. Some schools insist students buy iPads, a popular but relatively expensive mobile device, with many more schools waiting to see the results of the device usage and reaction of parents before implementing similar policies (Tasman-Jones, 2012).

In Japan, BYOT(D) has filtered into all levels of the university level of education, some private elementary, middle, high schools, and universities now require students to bring their own mobile devices, such as a tablet (White, 2016). There were suggestions for a plan to

equip all students at the elementary school level with a tablet by 2015. However, this never came to fruition. As of yet, there has been no official statement by MEXT or any other local government concerning a timeline for such a scheme.

## **2.5 Mobile Assisted Language Learning**

Mobile assisted language learning (MALL) has been created by advances in wireless technology and can be used to motivate learners anytime and anywhere. This convenience of use comes with the added benefit of being a low-cost and on a stable platform. MALL is being successfully used to aid in language learning because of its collaborative, convenient, real-time learning experiences available on-demand inside and outside the classroom (Kukulska-Hulme, 2006). However, "few investigations have delved into the relationship between learning strategies, learning achievement, and the application of MALL in English speaking and listening courses" (Liu & Chu, 2010, p. 631). The follow section will examine MALL in the Japanese context and how its development relates to this research.

### **2.5.1 Mobile Assisted Language Learning in Japan**

In Japan, where there is more than one mobile device per person, MALL results have not always been positive. Early research on MALL and Japanese university English language learners conducted by Stockwell (2008, 2010) demonstrated that when given the choice of using a mobile device or PC for completing vocabulary tasks, students chose a PC the majority of the time for reasons including the size of the keypad and screen on mobile devices, unreliable connection to the Internet, unattractive interface, and slow speed (Stockwell, 2010). In Stockwell's 2008 study of MALL in Japan, students stated mobiles were "not a tool for studying" (Stockwell, 2008, p. 260). Some of these earlier issues of the keypad and screen size, unreliable connection to the Internet, unattractive interface, and slow speed have been solved by the general improvement in technology and the introduction of the smartphone in the last 15 years. White and Mills (2012) found similar results to Stockwell in

that Japanese university students only used their smartphone devices for educational purposes 2.9 % of the time, compared with 16.7 % of the time for games. In addition, even though students possessed smartphones, only 14 % used a smartphone in their class.

However, an encouraging result, which differed from the earlier work of Stockwell, found that over 60 % of students believed using a smartphone would help their English language classes. A follow-up survey conducted one year after the original, White and Mills (2014) found the number of students who used their smartphones for educational purposes had increased to 7 %, while games had also increased to 25 %. Of most significance was the number of students who used smartphones in their classroom, which increased to 31 %, with over 70 % of students believing that smartphones could be useful in their classroom (White & Mills, 2014). This demonstrates that the attitude of Japanese university students is changing year on year and provides evidence for the need for research in this area. While this section has focused on technology in language learning the following section will outline the language learning process and the relevant theories related to the current research project.

## **2.6 Second Language Learning Acquisition**

Second language acquisition (SLA) is the process of acquiring a second or foreign language. Although a consensus has yet to be reached regarding a generally accepted theory of SLA there is a distinction made between learning a second language and learning a foreign language (Ellis, 1999) with SLA used as a general term to encompass both. Within SLA there are different types of acquisition, naturalistic and instructed, with naturalistic acquisition taking place naturally and during some form of instruction involving assistance of some form. In terms of naturalistic acquisition Japan is generally perceived as input-poor foreign language environment (Ota, 2009). Once students leave the classroom, they are rarely exposed to English input unless they specifically seek it out. This contradicts the input-rich teacher-centered methodology of the Japanese classroom, where the students receive copious

amounts of input (Richards & Rodgers, 1994). In Japanese classrooms, student-student interaction and student-teacher interactions are not encouraged, as may be considered the norm in a Western classroom. The next section will move on to discuss second language vocabulary acquisition as it relates to this research.

### **2.6.1 Second Language Vocabulary Acquisition**

In SLA research, the study of vocabulary acquisition has attracted considerable attention. However, research on this phenomenon in online contexts is limited. This study will specifically focus on vocabulary language acquisition from using the chat function and interaction while completing tasks in Minecraft. Laufer and Nation (1995) state that the learning of vocabulary is undertaken for the sake of communication and that vocabulary learning is advanced by learners who have a communication need. McCarthy (as cited in Gu, 2003) believes that, "the purpose of vocabulary learning should include both remembering words and the ability to use them automatically in a wide range of language contexts when the need arises." Similarly, Schmitt (2008) stated that vocabulary is an essential component in learning a language, making the learning of new words an essential aspect of language pedagogy.

Schmitt, Cobb, Horst, and Schmitt (2017) believe the lexical coverage, that is the percentage of written or spoken discourse needed for the learner to understand discourse is between 95-98%. Without understanding 5% a learner would still be able to comprehend to function. Understanding 98% of text or having 98% coverage is thought to entail a mean vocabulary size of 8000 words (Nation, 2006). For reference, the average undergraduate in New Zealand has a vocabulary size of approximately 17,000 words. This research will base its vocabulary on K-levels (Cobb, 1998). Each K level includes 1000 of the most frequently used words in the English language. As such K1 represents the first 1000 words, and K2 the next 1000 words. As the K levels increase the difficulty of the vocabulary increases and the

frequency of use decreases. Being able to comprehend vocabulary up to a K3 level is the equivalent of being able to understand 95% of English texts. From the above it is clear that the need to successfully acquire vocabulary is a necessity to gain a level of communicative competence in a L2.

Learning vocabulary is challenging due to its various aspects such as pronunciation, spelling, parts of speech, and meaning that need to be understood to employ vocabulary correctly (Nation, 2001). Moreover, an additional issue, is the incremental nature vocabulary acquisition (Schmitt, 2000) that presents a further challenge to learners. In the literature, it is claimed that there are two ways the learner can learn vocabulary, intentionally or incidentally (Laufer, 2003). Intentional vocabulary learning is where the vocabulary is explicitly taught through such methods as drill and repeat activities and explanation (Laufer, 2003). This type of learning is seen in the traditional classroom format where a teacher explicitly explains the vocabulary which is then followed by drill exercises using that vocabulary. In the Japanese context, the results of second language vocabulary acquisition strategies research has shown the rote memorization (Mochizuki, 1999; Crookes, Davis, & LoCastro, 1994) to be the main strategy for learning vocabulary. This is thought to be based on a continuation of the process in which Japanese students learn Chinese characters from a young age at school. However, to date, this strategy has not proven to be successful.

Incidental vocabulary acquisition in contrast does not occur from explicit instruction but organically from activities (Laufer, 2003). It is asserted in the literature, that incidental learning may occur in task-based language learning environments (Laufer, 2003). This environment is where students are given a goal focused activity involving use of the TL but are not explicitly taught the language needed to complete it. Task based learning will be reviewed in more detail at a later stage of this review. In the context of this research, the current study investigates incidental learning of vocabulary as students will not specifically be

instructed on the words to use or their lexical meaning. Web and Chang (2015) claim that the success in incidental learning of vocabulary is due to the frequency with which the learner encounters an unknown vocabulary item. There is no magic number for the number of times vocabulary must be used for it to be successfully learned (Waring & Takaki, 2003), although some researchers have attempted to devise one. Nation (1990) for example, believes that it takes 5-16 exposures to a word to learn it from context. In contrast, Meara (1997) believes that L2 learners only uptake 1 in every 100 words they are exposed to. However, what appears more important is the context in which the vocabulary is used. Research suggests that the more meaningful the context the greater the chance of successful incidental learning (Feng, 2016). In addition, influential research indicates that vocabulary must be introduced in incremental rates for learning to be successful (Schmitt, 2008).

### **2.6.2 Second Language Vocabulary Acquisition and CALL**

As was noted previously, CALL has had a place in the education system since the 1960s with the PLATO system being the first system language training available to learners. At this time text was presented on the screen in a drill and repeat system. In the past 20 years, technology has advanced significantly and with it ways to learn vocabulary using CALL. Brown and Culligan (2008) developed a format in which students completed vocabulary language learning activities on computers before accessing flash cards on mobile devices based on their needs. Chen, Hsieh, and Kinshuk (2008) reported on a study where 24 flashcards were delivered to mobile devices after which students had 50 minutes to learn the vocabulary. Test results of this program indicated that students with a low verbal, but high visual learning ability were able to retain the vocabulary. Other open source programs such as Moodle, and open flash programs have allowed educators to develop their own vocabulary learning techniques. Two of the more successful commercial programs used in Japan are English Central (Mills & Kennedy, 2013) and Word Engine (Armstrong, 2020). English

Central is a website that claims watching authentic videos may improve a students' speaking, listening, and vocabulary knowledge. The website has published data on successful case studies where a clear target goal has been set and the program has become a popular alternative to using outdated CALL software in an increasing number of Japanese institutions. Similarly, Word Engine claims to be the fastest system to learn vocabulary available and is said to be used by top schools around the world including Japan. This website also promotes several successful peer reviewed studies that use Word Engine to highlight its effectiveness. What may be observed from the discussion of the above literature is that there are many CALL based vocabulary programs available to students in Japan and several have enjoyed some degree of success. In this context, the next paragraph will examine the specific nature of vocabulary acquisition in relation to this research.

This research investigates vocabulary acquisition through the use of Minecraft, a digital game. A review of the relationship between digital games and vocabulary acquisition can be found in a later section of this chapter. In this research, many of the difficulties mentioned above have been eliminated, as it was anticipated that students would be able acquire vocabulary more easily through incidental task-based learning during play in Minecraft and interacting together in English through chat. The current section has discussed SLA and specifically acquisition of vocabulary. In the next section, SLA research relating to social constructivist theory will be examined.

### **2.6.3 Second Language Development (Social Constructivist Emphasis in SLA)**

The social constructivist approach to SLA is central to this research project. This approach is derived in part from the theories of Vygotsky (1978) and his theory of the zone of proximal development (ZPD). Vygotsky saw cognitive development as dependent on human interaction and with tools in the child's world. By tools, Vygotsky was referring to pens, papers, computers, languages, and other artifacts. ZPD is the distance from where the student



is at in their own development process, and where they could possibly be with the help of a more knowledgeable other. Through collaboration and social interactions, the individual learner can complete functions that he/she would not be able to carry out independently. The knowledgeable other could be a peer, a teacher, or any individual or anything that can help the student in scaffolding during the internalization process. It is thought that ZPD will emerge when the learners actively participate in the process of assisting each other through collaborative scaffolding (Vandergriff, 2006), a process where the student can undertake a task, solve a problem, or gain control of L2 forms and meanings through assistance.

The social constructivist approach to SLA places emphasis on the role of collaborative learning and negotiation of meaning (Martinez, Dimitriadis, Bartolomé, Eduardo, & de la Fuente, 2003). From this perspective, the language learner is viewed as an active participant in meaning-making and problem-solving in the learning process and is considered a constructor of knowledge. Learning is achieved through differences in the individual learners' affective and cognitive resources where collaborative knowledge is developed through individual differences in terms of knowledge, skills, personality, cultural values, and lifestyles. Levy and Stockwell (2006) outline three principles that are to be considered the primary principles of the social constructivist approach: 1) The individual forms their own representation of knowledge 2) Individuals learn through active exploration 3) Learning occurs within a social context, thus meaning interaction between peers is a necessity in the process of learning. This approach asserts that students can learn more effectively if they are actively engaged in making a connection between the material and personal experiences (Wan, Tanimoto, & Templeton, 2008).

Social constructivists (Vygotsky, 1978) emphasize that social interaction is both a prerequisite and a significant element of an individual's cognitive development as it allows them to internalize the ideas, they encounter within the social realm. Social constructivists

believe that learning involves a constant reinterpretation of meaning as new social practices evolve, and to meet the need of the transformations in their environment (Nyikos & Hashimoto, 1997). Vygotsky (1978) believed in the necessity for interaction in a group setting as a precondition for self-regulation to take place. Self-regulation begins the process where individuals find their own authentic voice in the process of problem-solving by using the mediational tool of language (Nyikos & Hashimoto, 1997). What is clear from these principles is that the learner is the central figure and that students should be encouraged to collaborate and engage with each other allowing them to negotiate and develop a shared perspective and meaning (Levy and Stockwell, 2006). Conceptualizations of the role of the teacher have developed within the socio-constructivist paradigm. This was originally a one-way teacher-centered approach. However, the approach is now more student-centered with more significant influence and importance being assigned to cognitive development through peer interaction. This approach affords students opportunities to engage collaboratively and to construct knowledge by discovering principles by themselves. Using observations and informed by social constructivist theory, the current study investigates how students engage and interact with each other within the context of completing tasks to win the game. This research further explores the chat-based interaction that the participants utilized to communicate and achieve their goals. The next section will move from a general discussion of SLA to focus on language acquisition in the Japanese context.

#### **2.6.4 SLA in the Japanese Context**

EFL classes of all levels in Japan have a reputation for not producing a significant amount of output due to the predominance of the grammar-translation method (Richards and Rodgers, 2014), where teacher-centered classes prevail (Japan Times, 2013a), with the teacher assuming the role of an authority figure who should not be questioned. Teaching styles have changed slowly in the history of Japanese education, however at the time of

writing the biggest change in teaching styles in generations is currently occurring in Japan with the enforced move to online teaching from face-to-face. Even with the COVID epidemic severity still unknown in Japan, primary and secondary and even some tertiary education institutions moved quickly to reinstate face-to-face classes, with both teachers and students finding it difficult to adapt (Hata, 2020). In the face-to-face context of Japanese education students do not tend to ask questions freely, as might be observed in a Western-style classroom. To ask a question out of turn may be seen as being disrespectful to the teacher. Kobayashi (2010) believes the grammar-translation method is creating students obsessed, not with learning English for communication purposes, but rather attaining a grade high enough to proceed to the next stage of education at a more prestigious school university, contrary to the goals of MEXT. Also, Japan is a cohesive society, and nobody wants to stick out from the crowd. There is a saying in Japanese 'deru kugi wa utareru,' which translated into English means 'the nail that sticks up gets hammered down.' This suggests that if someone stands out from the crowd in Japan, they are opening themselves up to be a target of jealousy and criticism, and this also applies to the EFL classroom. While SLA is a crucial focus of this study it is also important to analyze the interaction elicited as students in this research were compelled to interact with each other in order to complete the tasks using the chat function of the game. From now communicative competence and its relevance to the current research will be introduced.

## **2.7 Communicative Competence**

Communicative Competence is important for this research as it is this area that the Japanese government wishes to improve “the underlying systems of knowledge and skill required for communication” (Canale, 1983, p.5). In relation to second language pedagogy, Canale and Swain (1980) were the first to provide a theoretical framework of the areas of communicative competence: grammatical, sociolinguistic, and strategic. Canale (1983) later

divided sociolinguistic further separating discourse competence. Communicative competence from this perspective even the aspects of skills required to employ language knowledge are part of communicative competence. This differs from the earlier work of Chomsky, who would define communicative competence in a more traditional grammatical sense. The four areas of communicative competence as outlined by Canale (1983) are defined below.

- Grammatical competence: this is the mastery of L2 phonological and lexicogrammatical rules, pronunciation, vocabulary, in addition to word and sentence meaning.
- Sociolinguistic competence: The mastery of socio-cultural rules and their appropriateness in L2 use. This means that the learner should understand how utterances are produced and understood in various sociolinguistic settings.
- Discourse competence: The mastery of rules concerning cohesion and coherence of discourse in L2.
- Strategic competence: The mastery of verbal and nonverbal communication strategies that are used when to enhance the effectiveness of communication or compensating for deficiencies in other areas of communicative competence.

Sociolinguistic and discourse competence will be the focus of the current research as the students are focused on writing and through the chat function of Minecraft and thus grammatical competence and strategic competence as defined above are irrelevant. The following section will provide an overview of the conceptualization of interaction in the literature and current thinking on its role within the classroom context.

## **2.8 Interaction**

Interaction is a "fundamental fact in classroom pedagogy" Allwright (1984, p.156) because learners attempt to produce comprehensible output during the process of interaction, which itself becomes a form of input for interlocutors. Hegelheimer and Chapelle (2000)

believe that language-learning interaction should "help learners comprehend the semantics and syntax of input" and, in addition, "help learners to improve the comprehensibility of their own linguistic output" (Hegelheimer & Chapelle, 2000, p. 42). The current study will observe students when playing a video game in a collaborative context to investigate the level of interaction and the English learning potential based on this interaction. Interaction studies since the 1980s have investigated interaction both inside and outside of the classroom settings (Gas & Mackey, 2007), as well as the importance of interaction with interlocutors in SLA (Long, 1981, 1983a, 1983b). The consensus of current interaction literature indicates that interactions have a positive effect on the process of language acquisition. Research to date has focused on NNS-NS interaction and how this affects language acquisition. However, less has been conducted into the interaction between NNS-NNS, the primary interaction that occurs in a language-learning classroom, and the form of interaction investigated in this research.

Long's (1996) interaction hypothesis, for example, does not mention NNS-NNS interaction. One classroom-based study that did allow for NNS-NNS interaction was that of Adams (2007). In his study of learner-learner dyads, he found positive results in half of the instances of feedback stating that "interaction between learners, like the interaction between learners and native speakers, is beneficial for second language development" Adams (2007, p.43). In another study conducted in an online context, Fernández-García and Martínez-Arbelaiz (2002) investigated NNS-NNS interaction in a Spanish EFL setting and discovered that beginner NNS dyads engaged in task interaction were able to produce modified input and feedback to other NNSs. In the Japanese EFL context, the interaction between a native speaker and English language learner outside of the classroom is more challenging to obtain, and EFL learners in Japan have few opportunities to use English in their daily lives (Tse, 1995). The importance of interaction with others within the group for this study is that learning can occur as these interactions will assist the learner to understand what area or areas

of language are difficult for them (Gass, 1997). By coming aware of their own language deficiencies, it may encourage them to develop strategies to improve their language ability such as self-correction or seeking feedback from other NNS or NS.

### **2.8.1 Social Interactions in Video Games**

Interaction also needs to be examined in the context of video games. Griffiths et al. (2011) conducted a review of five studies involving use of massively multiplayer online role-playing games (MMORPG) and found that social interaction was an essential aspect of the game play. Results from one of the studies in this review found that the social aspects of the game were the most important element for gamers, while another highlighted the strong friendships and emotional relationships that developed through playing the MMORPG. Some participants in the studies reviewed reported that it was easier to converse online compared to face-to-face. Cole and Griffith (2007) found similar results in their study of 912 gamers with 74% of females and 76% of males stating that they have made friends in the online environment. However, females were more likely to take this relationship outside of the gaming world than males. As will be outlined in future chapters, the current study did take place online. However, the participants in this study were in the same physical space. Even so this study shows that the participants demonstrated some of the above characteristics.

Peterson (2008) states that another advantage of social interaction within video games is that message length between participants is short. Werry (1996 as cited in Peterson, 2008) believes this to be due to such aspects as screen size, the speed at which the chat is occurring, and such aspects as typing speed. While not all of these factors apply to this research, as the students will be chatting in written English, their second language, speed chat and typing speed may be. The discussion in the following sections will examine in greater detail the nature of computer games.

## **2.9 The Nature of Computer Games**

The current study brought digital games into the classroom setting for language-learning purposes. Digital games are now rivaling television, music, and movies as a form of entertainment. The digital game market is expanding rapidly it was approximately 93 billion dollars per year in 2010, \$111 billion in 2015, and \$152 billion in 2019 (van der Meulen & Rivera, 2013; Kaplan, 2019). In education, there has been some experimentation and research conducted with the use of digital games in the classroom since interest started in the 1980s (Bryce & Rutter, 2006) with various levels of success reported. A more in-depth discussion regarding the positives and negatives of digital game use will be provided at a later stage of this discussion. In this research a video game, or computer game, is a term "used broadly to include all digital games playable on a device with a video screen, which would include computers, game consoles, cellular phones, and mobile devices" (Botturi & Loh, 2008, p. 1).

As the current research focuses on computer games, there is a need to establish a clear definition what will be accepted in this research. Below are two definitions of computer games. Computer games have been defined as;

“Any forms of computer-based entertainment software, either textual or image-based, using an electronic platform such as personal computers or consoles and involving one or multiple players in a physical or networked environment”  
(Frasca, 2001, p 4).

Juul (2005, p 6-7) goes into more depth, suggesting that any game needs to incorporate some of the following:

- A rule-based formal system
- With variable and quantifiable outcomes
- Where different outcomes are assigned different values
- Where the players exert effort in order to influence the outcome
- The player feels emotionally attached to the outcome

- And the consequences of the activity are optional and negotiable

While many other conceptualizations of computer games exist, the current research accepts the above definitions, as they are compatible with the scope of this research and provide a credible basis for comprehending the two major theories of games: Narratology and Ludology. Narratology represents a range of theoretical perspectives, including theater criticism, literacy studies, transmedia storytelling and suggests the games are a form of narrative. Ludology, in contrast, places importance on the study of computer games as an independent field and is interested in investigating the interrelationship between games, rules, and play (Peterson, 2013). Simons (2007), among others, has attempted to unite the two into an emergent theory of game studies taking into consideration both the narrative and player experience, which Juul (2005) has developed into a four-level hierarchy of representation in-game worlds. The current study falls into the ludology perspective as the interrelationships between interaction and play will be investigated.

In addition to the theories of games, it is crucial to recognize that there are different categories of games: serious games and off-the-shelf (COTS). Serious games (Prensky, 2008) are games that have been developed with a specific learning goal in mind. These games explicitly aim to teach or reinforce a concept in a digital format and are used as a teaching aid rather than a stand-alone tool. It could be argued that the goal of these games is not to make a significant profit, but rather fulfill an educational purpose. Prensky (2008) suggests that there is a need to distinguish between mini and complex games within educational games. The former being any game that takes less than an hour to play, has a narrow subject field, and multiple levels, which are only distinguishable by an increase in the difficulty level. The latter take multiple hours to complete, contain adventure, role-playing, simulation, have complex goals, and require considerable skills to achieve the goals. In contrast to serious games, COTS (Gee, 2003) games are not designed to teach content but create scenarios where the user can



enter and become engrossed with the game itself and are designed for entertainment. There are often self-contained goals in these games, such as completing a mission or beating the highest score, but the game's content does not attempt to teach anything that can be used outside of the game. Commercial developers have the goal of becoming popular with mainstream users and making a profit. The game used in the current study falls under the commercial definition.

## **2.10 Computer Game Genres Explored in CALL Research**

Peterson (2013) highlights several distant genres of games that are utilized in CALL: Text manipulation, text-based adventure, simulation, first-person shooter, 3D adventure, massively multiplayer online role-playing games (MMORPGs), multiuser virtual environments (MUVES), sports, and rhythm games. Each genre has its own distinct qualities and contains features of the definitions outlined previously. During the last 20 years an increasing number of innovative studies were undertaken with computer games in the classroom. While traditional serious games are still used, COTS are beginning to find favor with some academics, as "these games are fun and engaging. They can encourage different ways of learning and thinking and provide the opportunity to teach and practice new skills and encourage imagination, creativity and exploration" (Chen & Huang, 2010, p. 135). In the early 2000s, some academics believed computer games in education could be viewed as a form of "stealth learning" (Prensky, 2001, p. 24), where students learn through the process of playing the game without being consciously aware of it. While the concept of stealth learning is debatable, the idea that "a motivated learner can't be stopped" (Prensky, 2001, p. 7) is more relevant. Below is a summary outlined by Peterson (2013) of how each computer game genre has been used in CALL-based research. While this list is a summary of a small proportion of the studies that have been conducted to date, it highlights that each game type can be used, a variety of languages have been investigated, and multiple platforms are available.

**Figure 4***2D and 3D Computer Games Utilized in CALL Peterson (2013)*

<i>Game Type</i>	<i>Study</i>	<i>Title</i>	<i>Language</i>	<i>Platform</i>
First-person shooter	Stubbs (2003)	Kana No Senshi	Japanese	PC, Laptop
3D adventure	Chen and Yang (2011)	Bone	English	PC, Laptop
Role-play including massively multiplayer online role-playing games (MMORPGs)	Rankin, Gold, and Gooch (2006)	Ever Quest II	English	PC, Laptop, Mobile device, Console
	Thorne (2008)	World of Warcraft	English	PC, Laptop, Mobile device, Console
	Piirainen-Marsh and Tainio (2009)	Final Fantasy X	English	Console
	Suh, S. Kim, and N. Kim (2010)	Nori School	English	PC
	Reinders and Wattana (2011)	Ragnarok Online	English	PC, Laptop
Multiuser virtual environments (MUVes)	Johnson (2007)	Tactical Iraqi Quest	Arabic	PC, Laptop
	Zheng et al. (2009)	Atlantis	English	PC, Laptop
	Liang (2011)	Erie Isle	English	PC, Laptop
Sports	deHaan (2005)	Powafuru Pro Yakkyu 6	Japanese	Console
Rhythm	deHaan, Reed, and Kuwada (2010)	Parappa the Rapper 2	English	Console

Moving beyond understanding the genres of computer games it is also necessary for the purposes of this research to comprehend the theory underpinning their use for language learning. The following section will introduce the concept of GBL and examine the role it plays in the current research.

## 2.11 Game-Based Learning (GBL)

The previous section discussed what a computer game is and how it has been used in CALL-based research in the past. It is now necessary to gain a deeper understanding of why games are used. The rationale for the use of games in education is articulated in the concept of game-based learning (GBL). Brown, Comunale, Wigdahl, and Urdaneta-Hartmann (2018) believe that GBL is a broad field that incorporates various platforms and games. These include COTS, serious games explicitly developed for educational purposes, and virtual worlds. In recent years, there has been an increased interest in using digital games for educational purposes at both a research and policy level. This is due to the continued popularity of computer games in various formats, especially among young people, and a perceived lack of engagement with the schoolwork of the same cohort (Pelletier, 2009). Making digital games through the process of Game Jams have also been used as a mean of facilitating language communication (White, Piumarata, Yamanishi, Jacobs & Simkins, 2019), with the Global Game Jam (Kultima, 2015) attracting an increasing number of participants year on year. Though there is a shared interest in using digital games for educational purposes, this does not suggest that researchers and policymakers view video games and play from the same ideological perspective.

In the early 2000s, "the presumption of failure (of traditional education practices) has tended to frame video games as a kind of remedy, which can be brought into either educational institution themselves or the domain of educational theory to help understand and address the shortcomings of the current educational practice "(Pelletier, 2009, p. 84). To investigate whether such claims were indeed true, Dawes and Dumbleton (2001), as part of the Computer Games in Education project, investigated aspects of games that might support teaching and learning in schools. Dawes and Dumbleton's report found many positives for the use of video games in the classroom, including increased motivation, collaboration, self-

esteem, and engagement with content. However, some concerns were also noted. Most worryingly from a teacher's point of view was the belief that video games could be used to facilitate learning outcomes but that they may be too engaging for students. One suggested solution to this problem was that students should periodically "break off" from using games to concentrate on other classwork aspects. A further finding of this report stated that the games were designed for boys and that girls may be at a disadvantage if games were indeed brought into the classroom to address current educational practice's perceived shortcomings. At that point in time, video games were viewed from an educational standpoint as a means for developing skills, including negotiation and critical thinking. Shaffer, Squire, Haverson, and Gee (2005) provided one such example, who documented a political struggle conducted online between a 14-year-old and a 21-year-old for control of a virtual Sims town. While not used in a classroom setting, this game's users were seen to acquire life skills, including the ability to debate, run political systems, and negotiate. Researchers and policymakers can agree that these are necessary skills for students to possess and are challenging to teach in traditional classroom settings.

Possibly because of the complementary research coming from the use of games outside of the classroom setting, a chain of thought has developed asserting that game-based design patterns could be used in a type of collaboration between commercial game designers and educational software developers to make new and effective educational software (Pelletier, 2009). However, this ideology, which was seemingly originated more from administrations keen to exploit the positives of GBL without understanding the theory behind it, would only allow for educationally desirable skills to be 'taught' within educational software, and disregarded the fantasy aspects found within commercial games (McFarlane, Sparrow-hawk, & Heald, 2002). At this time, policymakers seemed to overlook the fact that even games with desirable content, such as debating skills, running political systems, and

negotiation skills provide, within the same game, opportunities for players to use cheats, kill off rivals, and raid villages for personal gain which was often why the player enjoyed the game. Young (2008 as cited in Pelletier, 2009), in response to this, criticizes those who suggest it is possible separate the skills considered necessary for classroom learning and those found within the game domain. Even while this argument has continued taking place, an alternative conceptualization was developing.

This argument moved away from viewing games as being a motivational delivery method and focused on how students should and were learning in the digital age. Gee, in the late 1990s and early 2000s, writes about how games exemplify an implicit theory of learning, where learning is not an outcome of playing the game but a process of it. Gee suggests, "learning and playing are largely synonymous processes; the pleasures and frustrations of playing are akin to those of learning" (Pelletier, 2009, p. 86). Pelletier argues that this presumption of the failing educational system has made video games into a cure, easily transposed from a play activity conducted by students outside of school, for which they are not. Beavis (2013), with a similar perspective, states that "it is part of a broader pattern of boosterism that assumes an unproblematic transfer of games and gameplay from out-of-school to in school, a naïve perspective on learning, and glosses compulsory compliance with willing participation, ignoring questions of identity, relationships, context, community and the like (Sodestorm et al., 2006), as well as issues of performance and performativity (Chee, 2011, p. 418)". This means for any research involving games in the classroom careful planning and consideration of every aspect must be taken into account. In addition, it cannot be assumed that the engagement seen with gaming consoles and games seen outside of the classroom will occur when brought into a recognized learning environment.

As previously stated, one of the significant issues in researching the use of video games in the classroom is that it makes the presumption that current academic institutions are

failing to engage students with the curriculum. In addition to this, it also suggests that schools are failing to give students the necessary tools for the digital world and failing to make use of digital technology available to them (Pelletier, 2009). The current research project, in some ways, follows this line of thinking but acknowledges that while some students may be failing to engage with the current curriculum, no assumptions can be made for the population as a whole. However, the presumption that schools are failing to give students the necessary tools for the digital world and failing to use digital technology available to them does seem to have some foundation in Japan. The following section will continue the discussion on video games and learning by revisiting the concept of play, this time in relation to video games.

### **2.12 Play in Video Games**

In this research, it is necessary to demonstrate how play relates to video games and why video games are used in CALL. As previously outlined, Huizinga's view is that play is entirely absorbing, uncertain to some extent, involves illusion or exaggeration, and exists outside the reality of everyday life. His concept asserts that the players are conscious that their play activities are not real, and as such, play has no effect on their outside lives. This view gives rise to the magic circle of play, a somewhat controversial concept coined by Huizinga (1955), and then later applied to the digital world by Salen and Zimmerman (2004). The magic circle is said to be the bounded space in which play occurs. In this context, this space would be inside the classroom, where students are bound by the classroom rules and the game, negotiate relationships with other players, and co-construct meaning by playing the game. The magic circle name in the digital world relates to a particular time and place that has been created by the game. Salen and Zimmerman (2004) stated their opinion that something genuinely magical happens when a game begins.

However, this concept is controversial with Castronova (2005), suggesting that the concept of the magic circle provided by Salen and Zimmerman is not complete and that the

magic circle, according to Salen and Zimmerman, is a shield that acts to protect the fantasy world from the outside world. Castronova believes the shield of the magic circle could and should be penetrated, allowing elements from the outside world to enter the circle, and elements from the game world to filter out of the circle. This belief suggests that people playing games are continuously moving from one side of the circle to the other, meaning that their attitudes, beliefs, and behavior also inevitably move, influencing each side of the circle. Due to this, Castronova suggested adding a membrane on top of Salen and Zimmerman's magic circle concept and calling it the "almost magic circle" (p. 147).

Woodward (2008), in his paper 'abandoning the magic circle' sides with Castronova highlighting that the very idea of a circle suggests that there is no entry and exit point, which contradicts the nature of a digital game in which, at some point, you must start playing, enter, finish and exit. Woodward also debates the idea that emotions can be contained within this circle and do not cross into real-life. He stated, "This would seem to me to be illogical, as it is very rare that a human can completely separate one experience from another, there would always seem to be some crossover in emotions and psychological state between one experience and the next" (Castronova, 2005, p.4). It seems that the more play is investigated, the more complex and controversial it becomes. The current research project adopts Castronova's concept, as it is impossible to believe that students are able to switch on and off while playing games and doing other activities. To the researcher, the attitudes, beliefs, and experiences a student has in their daily life and while playing games cannot be mutually exclusive. The above reexamination of play in relation to video games is now followed by a review of research on how video games have been utilized in language learning.

### **2.13 Video Games in Language Learning**

Peterson (2013) examined several meta-analyses of computer games and learning. Firstly, for positive findings, Peterson highlights that current studies conducted over a wide

range of settings have concluded that computer games are highly exciting and motivational for many learners. In addition, cognitive skills, literacy skills, problem-solving skills, improved visualization, and psychomotor skills have been reported to benefit from using games for learning. However, Peterson (2013) also outlines the negative issues with the current body of research available. There are limited studies that address the learner's game experiences. Moreover, many studies are the small-scale and their claims are frequently unsupported. In addition, there are methodological problems, lack of controls, the overuse of single measurements of learning, and a scarcity of longitudinal studies.

Considering the positive and negatives of the studies currently available, this discussion will now take a more in-depth look at some of the relevant literature in relation to video games and language learning. One of the most comprehensive reviews of video games and learning was conducted by Young et al. (2012), who identified over 300 articles related to video games that measure some sort of academic achievement as a dependent variable. Their meta-analysis aimed to establish the educational affordances of video games in the areas of mathematics, science, language learning, physical education, and history. Results found little in the way of positives for using video games in mathematics, science, and history compared to traditional teaching approaches but, in contrast, more positive results for language learning and a lesser degree physical education. Regarding language learning, Young et al. (2012) theorized that video games have the ability to bring learners into an immersion-type environment, which is thought to be the most effective way to learn a language. In addition to this, there was a difference compared to the pedagogy found in most language classrooms. This means that the language-learning classroom is social; in turn, the classroom's language has socially contextualized pedagogy providing abundant opportunities for interactions in the TL. Mathematics, science education, and history classes do not provide such a social environment, with the majority of the language used in the classroom being



direct instructions, which means that subjects including mathematics, science education, and history provide fewer opportunities to benefit from the use of video games in the classroom in comparison to language learning.

Similarly, Perrotta, Featherstone, Aston, and Houghton (2013) conducted a 'rapid review' of video games and learning from 2006. The 31 articles included in this paper included a range of sources; empirical, practice-based evidence, and more speculative literature. Three important definitions adopted in this research are outlined below.

- *GBL* – broadly refers to the use of video games to support teaching and learning.
- *Gamification*- using elements derived from video-game design, which were then deployed in various contexts, rather than about using individual video games.
- *Gameplay* - the treatment of topics and ideas as rules, actions, decisions, and consequences, rather than as content to be communicated or assimilated.

The literature reviewed suggests that GBL is not focused on the computer game as a specific entity but focuses on social dynamics. Perrotta et al. (2013) explain that social dynamics relates to affinity groups. Through fan websites, learners share cheats and wikis with similarly interested peers who, through a shared interest in the game, engage in sophisticated communication, developing social practices outside of the game context. Shaffer (2008, as cited in Perrotta et al. 2013) argues that this type of learning is more beneficial than the outdated knowledge that is acquired in regular schooling. This again highlights the idea expressed in the early 2000s of the shortcomings in educational practice. However, the difference at this time is that rather than seeing games as the cure to a lack of engagement, an argument for the gamification of schooling is put forward Perrotta et al. (2013). This strategy

could be used as a tool to improve teaching, learning, and assessment within schools. Two simple examples are given in the article of gamification of the classroom language; assignments become missions or quests and encourage competition and self-improvement through leader boards, badges, and high scores. While these are very simplistic examples, the idea is that even within the bounds of the current curriculum, a gamified classroom can be created to improve teaching, learning, and assessment.

There is still a high level of debate regarding the overall impact of video games and gamification on academic achievement. Gamification “has become a recurrent methodological strategy in the field of education” (Pujola & Appel, 2020 p.93) including foreign language education. Pujola and Appel (2020) suggest this is in response to the desire of teachers to enrich student engagement through the use of game type elements while using technology and to create an enjoyable learning experience. The studies reviewed here consistently found that video games can impact positively on problem-solving skills and knowledge acquisition Perrotta et al. (2013). Even with these positives, there are still some unanswered questions. Firstly, the Perrotta et al. (2013) review found little in the way of evidence for sustained results over time. Secondly, few studies investigate the effects on learner attitudes. Moreover, the presumption of a positive link between motivation, attitudes, learning, and outcomes has, to date, not been adequately addressed in the literature. Thirdly, there is insufficient evidence to convince most teachers to change their traditional teaching styles. Of the 21 studies reviewed in Perrotta et al. (2013), six were related to mathematics, two for science, and the remainder (amount unspecified) split between computer science, language, civics and society, and three studies that did not include information relating to the subject. Also, three studies specifically avoided curriculum subjects. Perrotta et al. (2013) also point out that the age of the learners in most cases was secondary school level, followed by university students with only one study conducted at the primary (elementary) school

level. The authors discovered that some of the studies desired to measure motivation and engagement, and thus chose games they believed were compatible with Keller's (1987) attention, relevance, confidence, and satisfaction (ARCS) model of motivation to facilitate children's learning (Chuang and Chen, 2009; Kebritchi, Hirumi, & Bai, 2010). Perrotta et al. (2013) reviewed eight studies that attempted to measure the impact of video games on student motivation and engagement (Annetta, Minogue, Holmes, & Cheng, 2009; Fengfeng, 2008; Kebritchi, Hirumi, & Bai, 2010; Liu, Cheng, & Huang, 2011; Papastergiou, 2009; Schaaf, 2012; Vos, van der Meijden, & Denessen, 2011; Ya-Ting, 2012). The measurement method was variable across the studies and included student surveys that collected self-efficacy measures or students' perceived level of focus on the game and observation relating to 'time on task'. The majority of the studies reviewed concluded that games could positively impact motivation, only two studies reported negative findings (Kebritchi et al., 2010; Vos, van der Meijden, & Denessen, 2011).

Chiu, Kao, and Reynolds (2012) conducted a meta-analysis into the relative effectiveness of digital GBL types in English as a foreign language setting. In this meta-analysis, 16 studies of action-based drill and practice games, meaningful and engaging educational games were analyzed. In their study the above authors found that meaningful and engaging games had a larger overall effect on learning compared to drill and practice games. The authors believe this to be because meaningful and engaging games give the learner the opportunity to interact and negotiate the meaning of the language used while drill and practice games do not.

Similarly, Tsai and Tsai (2018) conducted a 26 study meta-analysis into the effectiveness of digital games for L2 vocabulary learning, the need for which they believed was caused by conflicting results from previously published studies and differing criteria for the results. The studies in the meta-analysis were analyzed based on two game types. The first type was drill games which enabled L2 learners to learn through repetitive practice with words in texts and

grammar games. The second type was tasked based, a game in which participants use language, critical thinking skills, and problem-solving skills to achieve a goal. A major difference between the two being that drill games focus on form while tasked based games focus on meaning. The researchers also devised a series of other categories and subgroups to assist in their analysis as can be observed in Figure five below.

**Figure 5**

*The Codebook for the Moderators and their Subgroup Definitions (Tsai & Tsai, 2018)*

Category	Subgroups	Definition
Game Type	1. Drill type	The drill-and-practice types of games that provide exposure to words through multiple texts.
	2. Task-based type	Games involving problem-solving, simulations, decision-making (Breen, 1987) with learners' focus on meanings rather than on word forms (Estaire & Zanón, 1994)
Educational level	1. Primary	Preschool and elementary school students
	2. Middle	Junior and senior school students
	3. High	University students
L2 proficiency	1. Beginning	Primary level, no prior knowledge, kindergartens
	2. Beyond-beginning	Pre-, lower-level, intermediate-level
	3. Mixed	Studies using pretest as covariate without grouping participants' language proficiency
Linguistic distance	1. Close	The language scored $\geq 2$
	2. Far	The language scored $< 2$
Intervention setting	1. formal	Playing games in class
	2. informal	Playing games after class or at home
Assessment type	1. Receptive	Tests such as multiple-choice, which examine students' passive vocabulary knowledge
	2. Productive	Filling the blank, composition, presentation, etc., which test students' active vocabulary knowledge

Game source	1. Custom-design	Games developed for the research
	2. Web	Games offering free access online
	3. Software	CD-ROM, off-the-shelf software
Intervention duration		The duration was counted by the day. One week is counted as seven days.

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The researchers also created four conditions for digital game based L2 vocabulary learning:

- Condition 1 – Effectiveness of digital games in general
- Condition 2 – Effectiveness of values added-or-changed in games
- Condition 3 – Effectiveness of media
- Condition 4 - Effectiveness of non-game related factors

Tsai and Tsai found that for condition 1 digital GBL “significantly outperformed alternative activities on students’ L2 vocabulary gain” (Tsai & Tsai, 2018, p. 351). For condition 2, results indicated that “the added-or-changed features had an overall potential to significantly increase the effectiveness of digital game by a medium effect size compared to their base version” (Tsai & Tsai, 2018, p. 351). For condition 3, the researchers reported that “A significant medium-to-large effect size ... is reported, indicating that digital games were more effective for L2 vocabulary learning comparing to other means with equivalent content” (Tsai & Tsai, 2018 p. 351). While condition 4 that only included two studies showed no significant effect.

For conditions 1 and 2 the researchers further analyzed the studies based on the categories in table 5. For game type task-based games significantly outperformed drill games in relation to condition 1 but were insignificant for condition 2. In relation to educational level and condition 1, there was a large effect for university students, preschool students, and elementary school students. However, the effect was only small to medium for junior and

senior high school students. There was also no significant effect for condition 2. In regard to L2 proficiency level and condition 1, digital games provided greater effect when the students already had an understanding of English beyond that of beginner learners while condition 2 again had no significant effect. Based on these results, the authors conclude that this study adds further support to the argument that digital GBL is superior to traditional methods of L2 vocabulary learning.

Jabbari and Eslami (2018) conducted a scoping review in relation to second language learning in MMOGs. In this review, 31 empirical studies published after the year 2000 were analyzed with the results analyzed based on design features, social and affective affordances, L2 learning opportunities, and language learning outcomes. For design features the authors found that studies focused on the engaging multimodal communication opportunities created by the setting of the MMOG. These included the ability for gamers to remain anonymous, to use multiple routes and modes for communication, and the multimodal nature of the setting. In relation to MMOGs' social and affective affordances highlighted in studies pointed to the promotion of positive social norms including those of teamwork, peer mentoring, collaboration, and interdependence. The authors state how this is "crucial for L2 development" (Jabbari & Eslami, 2018, p. 99). In addition, the authors found that the social context provided by the game allows for expert-novice interaction in a low anxiety environment.

In terms of learning opportunities, the analysis found different advantages both within and outside the MMOG for practicing and developing L2 skills. These included:

- negotiation of meaning
- discourse management practices
- increased production of L2
- traditional and modern literacy practices

- socialization in the TL
- intercultural communication
- practicing conversation skills

Studies analyzed highlighted that verbal interactions in MMOGs presented opportunities for the negotiation of meaning to take place which is thought to be essential in the L2 learning process (Jabbari & Eslami, 2018). Other important communication strategies identified included requesting and checking based on player input. For L2 learning outcomes the result of this review found that communicative competence and vocabulary knowledge were “the most frequently acknowledged learning outcomes achieved through involvement in collaborative interactions within and beyond MMOGs” (Jabbari & Eslami, 2018 p. 102). Only a few studies acknowledged any improvement in reading, writing, listening, and speaking L2 skills.

It is clear that the literature in relation to video games and language learning has evolved significantly since the 2000s driven by rapid improvements in hardware and the increase use of the internet which has allowed for online games to be played by anyone, anywhere, and at any time. The increased popularity of online games has seen them become a subject of interest for classroom use, although research reviewed here suggests the greatest benefit may indeed be the use of digital games in an informal setting. There is an obvious benefit to games with meaningful tasks as the goal over drill and practice games, and a tendency for learners at both ends of the education spectrum, elementary and university to benefit more than those in the middle. While the current section has focused on video games in language learning in general, the next section will examine the specifics of the Japanese context related to this research.

#### **2.14 Second Language Acquisition and the use of Video Games in the Japanese Context**

Japan has an image internationally of being video game obsessed. This image most

likely has come to fruition due to the large number of game hardware and software companies based in Japan including Sony and Nintendo. As the statistics outlined below demonstrate, this image is somewhat deserved. A 2012 study of 600 Japanese elementary school students found that first and second-grade boys played video games for 52 minutes a day and used a computer for 21.6 minutes a day. The same grade girls played games for 38.7 minutes a day and used a computer for 19.9 minutes per day. Third and fourth-grade male and female students played games for 55.1 and 36.1 minutes, respectively. They also used computers for 32.4 and 25.5 minutes per day. Fifth and sixth-grade boy and girl students played video games for 55.1 and 38.2 minutes per day and used computers for 44.2 and 31.9 minutes per day each (Hakuhodo DY media partners, 2012). These statistics highlight that games were already being used by students during their free time in 2012, and with the advancement in technology and games since then, it is logical to assume the numbers have not decreased. At the Japanese junior high school and high school level, there is also very little in the way of formal or published studies. Nintendo DS consoles have previously been used at a Japanese junior high school level in a bid to improve English writing output using specially designed educational software (Then, 2008). However, the results of this study have never been published.

There have been some studies at the university level in Japan about the use of digital games and language learning. As has previously been mentioned in this literature review Peterson (2011, 2012a, 2012b, 2013) has been at the forefront of research on the use of digital games and English language learning in Japan. Peterson's work has focused mainly on the use of MMOGs in an informal context and has demonstrated the opportunities for learning created through the use of MMOGs. Bolliger, Mills, White, and Koyama (2015) found that Japanese university students played games for up to 70 hours a week but were reluctant to use games for formal learning purposes. The researchers concluded that this reluctance was based



on wanting to separate learning and play activities but also to student concerns related to health issues from overuse of devices. York (2019) explored the differences in the virtual world and face-to-face oral performance of Japanese university learners finding that virtual worlds may, in fact, be a hindrance to output fluency, have little effect on complexity and accuracy, but increased lexical density. In contrast to York, there has been some use of video games in the Japanese university context, which reportedly improved aspects of SLA. One study of Japanese university English learners stated, "output requirement presents learners with unique opportunities to process language that may not be decisively necessary for simple comprehension" (Izumi, 2002, p. 544). Results from an earlier study found little in the way of "unique effects on output" but did find "extended opportunities to produce output" (Izumi & Bigelow, 2002, p. 271), which is theorized to be essential in using target structures. The next section further explores the Japanese context with specific reference to way in which Japanese students chat with each other when using technology.

### **2.15 Chat Functions**

As was noted previously, the current research project asked the students to use a group chat function in Minecraft to communicate with each other in English to complete the weekly tasks. To gain an understanding of how Japanese students use technology to communicate White and Yamanishi (2020) studied the differences between how Japanese and international students use translation devices. In this study, the authors found that Japanese students tend to use short, simple language when using these devices. Whereas international students would use longer and more grammatically complex sentences. The authors theorized that this was due to Japanese students' experience interacting using translation devices and group chats in both their formal education and outside of the classroom. The current research did not use a translation device; however, the students were required to communicate together in written English, their second language, in a group chat. It could be anticipated that the same

simplicity in language observed by the authors in this study will be observed in the current study.

## **2.16 Gender**

Moving beyond computer games is a theory that will have implications for the current study. In educational research, gender differences concerning motivation have been researched in depth. Boys have been reported to have more competence in math, science, and athletics (Crain, 1996; Fredricks & Eccles, 2002), and girls in language arts (Crain, 1996; Marsh & Young, 1998). In relation to foreign language acquisition, most studies that have been published report that girls are more motivated to learn languages than boys (Dornyei, Crizer, & Nemeth, 2006; Sung & Padilla, 1998). Dornyei, Csizer, and Nemeth (2006) conducted a survey with over 13,000 13-14-year-old Hungarian language-learning participants. Results of from this research indicated that girls were more motivated to learn a language than boys, with similar results being reported in the US (Sung and Padilla, 1998) and Japan (Carreira, 2006).

In relation to digital game use, gender has been reported to be a significant contributing factor when investigating the attitudes of students toward video games. De Jean et al. (1999) and Bonanno and Kommers (2008) have demonstrated that adolescent men in the US play video games more often than females of the same age. Results from a survey of  $n = 1,242$  5th, 8th, and 11th-grade public school students and undergraduate university students in the US suggest that males average 18.6 hours per week to 8.2 hours for females. There was no age group in which females played games longer than males. The peak time for playing games was the 8th grade, with an average of 23 hours for males and 11.5 for females (Greenberg, Sherry, Lachlan, Lucas, & Holmstrom, 2010). The De Jean et al. (1999) Bonanno and Kommers (2008) studies also highlight how gender was a deciding factor when players chose the game to be played. Previously the differences between the two were thought to be due to

gratification theory, biological determinants, game content, representation of gender within the game, and possible differences in the abilities of males and females (Carr & Pelletier, 2008). However, other research on gender differences in video game use has shown that males' and females' motivation is similar.

Any gender differences become negligible in the implementation phase (Ke, 2008; Papastergiou, 2009a). In the US, 55% of video-game players are male, and 31% are females over 18 years of age. Only 19% of video-game players are boys under 17 (ESA, 2014). A 'gender rift' has been reported in game genre preferences. Games that are successful in attracting females have been called pink games. Green-brown games are games that attract male players (Cassell & Jenkins, 1998; Jansz & Vosmeer, 2009). Green-brown games are said to be war games, sports games and other highly competitive games. Pink games are said to be social games such as cooking, dressing-up, and other makeover games. Gender differences in gaming reflect the gender stereotypes and norms observed in Western societies (van Reimersdal, Jansz, Peters, van Noort, 2013). Stenberg and Morris (2001) highlight that girls, in particular, are sensitive to gender issues in their adolescence. Girls at this time prefer activities that stereotypically belong to girls, meaning girls prefer more gentle social activities and games. This may explain to some extent why girls do not play green-brown games, as especially during adolescence, gamers identify very closely with their game character: "Players do not perceive the game character as a social entity distinct from themselves, but experience a merging of their own self and the game protagonist" (Klimmt, Hefner, & Vorderer, 2009). The literature suggests that females do, in fact, play video games less than males. If we are planning to use GBL in the classroom, then this is a consideration that must be taken into account. Many issues have emerged from the literature that need to be addressed by the gaming industry, such as the lack of games designed by females for the mass market. If and when such issues are addressed, GBL may have more chances of success in the

classroom. In the Japanese context, White (2020) has shown that females are more inclined to ask game mechanics questions openly rather than struggle to solve issues by themselves. In contrast, while often more experienced in the use of games, male students appear less likely to volunteer answers to questions posed by other group members.

### **2.17 Issues with using Games in the Classroom**

There are some issues that the current research project needs to take into consideration when using games in the classroom. Young et al. (2012) concludes that there are two issues with using games in the classroom. Firstly that "games are often multiplayer and cooperative and competitive; they engage players for several hours of extended play, allow rich "hint and cheat" websites to develop around player affinity groups, and are played for weeks to years. However, most schools trade off immersion for curriculum coverage, individual play, and short exposures, goals that are not well aligned with engaging video-game play" (p. 80). Secondly, an issue relating to the question asked by the researcher. Young et al. (2012) believe the question "Do video games enhance academic achievement?" is the wrong question. Their analysis has demonstrated that numerous video games exist with a wide range of designs. A more appropriate question should relate to the complex interaction of player-game-context, "How does a particular video game being used by a particular student in the context of a particular curriculum affect the learning process as well as the products of school (such as test grades, course selection, retention, and interest)?" (p. 84) As with Young et al. (2012), Perrotta et al. (2013) present several issues. One such issue is the problematic elements of engaging video games.

An analysis of a study by Fengfeng (2008) concluded that students could become distracted by the entertaining elements of the game if these are not "meshed with the instructional component" (p. 13). A further issue came from the amount of detail, or lack thereof, given about the game itself in the studies reviewed. This lack of detail meant that it

was difficult to tell who developed the game, whether the game was design for commercial or educational use, what hardware had been used to test the games, and whether the games were single or multiplayer. Perrotta et al. (2013) believe that this lack of information had a general effect of weakening the evidence around using games in the classroom. Taking these issues into account, the researcher needs to consider each gaming session's limited time and administer ways of controlling the time students can play, mirroring what would happen in a classroom setting. The researcher should also expect that no two gaming sessions will be alike. Thus no assumptions can be made. While using Minecraft in research the participants will be required to complete tasks. The concept of tasks and how they relate to this research will be examined in the following section.

**2.18 Tasks**

In the current research students will be required to communicate together in English to complete tasks in Minecraft using the chat function. Task-based language learning (TBLT) has been commonly used in the SLA classroom for the past 30 years (Van Den Branden, 2006), and is considered to be a type of hands-on (Thomas, 2013) learning where the learner benefits from the multimodality of completing a task which requires more from the learner than simple drills. Long (2014) defines a task as “the real-world activities people think of when planning, conducting, or recalling their day” (p.6) and also as “target task” (p. 109) that learners will need to undertake in their L2, in this case English, the goal set by the teacher. Pica, Kanagy, and Falodun (1993 as cited in York, 2019) provide a task typology, see Figure 6, that highlights the relationship and communication needed between participants to interact.

**Figure 6**

*Task Typology for Communication Tasks (Pica et al. 1993 as cited in York, 2019)*

Task type	Inf Holder	Inf Requester	Inf Supplier	Inf Requester-Supplier relationship	Interaction requirement	Goal orientation	Outcome options
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<b>Jigsaw</b>	X & Y	X & Y	X & Y	2 way (X to Y & Y to X)	+ required	+ convergent	1
<b>Information gap</b>	X or Y	X or Y	X or Y	1 way > 2 way ( X to Y / Y to X)	+ required	+ convergent	1
<b>Problem- solving</b>	X = Y	X = Y	X = Y	2 way > 1 way (X to Y & Y to X)	- required	+ convergent	1
<b>Decision- making</b>	X = Y	X = Y	X = Y	2 way > 1 way (X to Y & Y to X)	- required	+ convergent	1+
<b>Opinion exchange</b>	X = Y	X = Y	X = Y	2 way > 1 way (X to Y & Y to X)	- required	- convergent	1 ±

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In this table X and Y represent the people communicating, the information holder is the participant who holds the information needed for completion of the task, and the participants requested to supply the information for the task are called the requester and supplier. As shown in the table the interaction can be either one-way or two-way and may not even be needed to successfully complete the task. The goals can be more (+) or less (-) convergent, and in some instances, tasks can have more than one possible outcome. In this research, all tasks types were implemented. For information gap, either X or Y participant can start with the key information for completing the task, whereas for problem solving, decision making, and opinion exchange both X and Y start with the same shared information. However, the understanding of the information will likely differ, thus they will need to undergo information exchanges in the TL. The tasks the students will attempt are provided by the researcher weekly and as such each participant will start with the same information. How they are able to use this information will differ based on their English level and their understanding of the game.

This chapter has examined the literature that has had a significant influence on the current research. The author understands that the literature being published on the above is in a constant state of change and that with-it ideas on these subjects will change over time. The author also acknowledges that each individual can interpret literature with a unique lens and the interpretation made by the author is not the only one to exist. Moving on from the literature the next chapter which will discuss the theory, design and methods related to this research.

## **Chapter 3: Research Theory, Design, and Methods**

### **3.1 Methodology**

This chapter will outline the research design employed in this study. The discussion will outline the research methods and questions pursued in this research. The discussion will also provide a detailed description of the background of each case study participant. At the beginning of this chapter, the epistemological origin of this research will be outlined. Following this, a detailed discussion of the design and procedures employed in this study is presented. This includes an explanation as to why the selected theoretical perspectives have been adopted in this research. After this, the research questions that formed the basis for the analysis and discussion in later chapters will be described. An overview of Minecraft will be provided with a description on the tasks the students participated in in the gaming sessions. This chapter will conclude with a detailed discussion of each case study participant and presenting their pre-research understanding and opinions on GBL.

### **3.2 Epistemological Origin**

The review of literature in chapter two has highlighted that various methods have been used to analyze the data collected during research on the use of digital games in education. As was noted previously, the mixed method approach (Creswell & Plano Clark, 2011) has been adopted as for this research. This approach enabled the researcher to collect data and analyze it from both qualitative and quantitative perspectives in order to answer the research questions. A mixed method approach has particular merit in studies involving digital games (Peterson, 2008; Perry, 2016; Iacovides, Aczel, Scanlon, & Woods, 2011, 2013) as these studies can often lie outside the confines of a single approach. The use of mixed methods offers the additional benefit of facilitating the triangulation of data. Moreover, the number of mixed method studies suggests that this method is of value in studies involving use of digital games.



For this study, a constructivism and interpretive paradigm was utilized. The study was guided by Guba and Lincoln (2005) and Lincoln, Lynham, and Guba (2011) and was informed by ontological relativism. This means that the realities of the world, as seen by the researcher, were mediated by his own senses and the way in which he engages with the world around him. As seen in this study, reality is individually constructed, and the researcher understands that there are many different realities in existence. In this study, meaning was not discovered but constructed through the researcher's consciousness, understanding, interaction, and experiences with the world around him. The meaning constructed in this research is unique to the researcher, as he is aware that others may construct different meanings from the same research.

Using an interpretive methodology, the researcher attempted to understand the phenomenon of using video games in the classroom and how, through interaction and play language learning occurs. The constructed meaning of the findings did not solely come from the participants and their interaction with the game, each other, and the teacher. Meaning was also influenced by the experiences, opinions, and beliefs students brought to the gaming sessions as well as cultural and historical contexts, which the students inhabit (Creswell, 2009). Multiple data sources including observation, vocabulary tests, in-game text analysis, and informal interviews were incorporated into the analysis.

This study uses a participant observation approach (DeWalt & DeWalt, 2002) during the gaming sessions. This allowed the researcher to gain a deep understanding of data collected in a natural setting through both observing and participating in the research activities. Through observing and participating with the students, the researcher was able to move beyond a simplistic interpretation of the data and build multiple layers of understanding to provide a thick description (Mills, Durepos, & Wiebe, 2010). Using an interpretive paradigm, the researcher intends to allow the data gathered to guide his understanding of the

meaning, and not precede it. The researcher acknowledges that an interpretive methodology will mean that the findings of this research may not be viewed in a similar manner by other researchers, as different interpretations exist in qualitative research based on each individual understanding and interaction with the world around them. To ensure the validity of this research, the researcher will provide an in-depth and comprehensive description in the discussion.

This mixed methods research relies on the coding of data by a single researcher. Creswell (2015) states the “text data are dense data, and it takes a long time to go through them and make sense of them” (p.152). The chat data in this research was indeed dense and a coding process was used as it allowed the researcher to index and map the data and to make sense of it in relation to the research questions (Elliot, 2018). The researcher first obtained the written chat conversation data from the chat application used in the weekly sessions and transferred it to a readable Microsoft Excel file, see Appendix seven. The researcher chose not to use coding software such as NVivo or MaxQDA for the chat data as he felt that that coding it by hand would assist in the process of gaining a deeper understanding of the data. With coding, especially at the PhD level, there is no clear guidelines in relation to the correct number of researchers required to code. Richards (2015) highlights that inter-coder reliability is likely to change over time as the researchers understanding of the data develops. She goes on to say that coding is an iterative process for doctoral projects, meaning that a single researcher can develop their own understanding of their data and their codes by reexamining earlier data and codes to refine and revalidate them as necessary. As above, the researcher believes that having the data for this PhD level research coded by a single researcher will enhance the reliability of the data as the researcher has had opportunities to reexamine and refine it as he feels necessary.

Moving on from coding it is also important to consider the privacy of the participants when designing research. An interpretive methodology has some issues concerning autonomy and privacy. As this methodology allowed the researcher to work closely with participants, he needed to be sure to respect their privacy. The researcher collected data from participants and imposed his own subjective interpretations on the data. Issues relating to who owns the data, how it was used, the direction of the research, and its publication will be addressed at later stages of this chapter.

This 11-week research project investigated how Japanese university students interact and play in the L2 using a digital game. The study focused on how the participants communicated via written text chat while completing in-game tasks. For this research, case study and participant-observer methodologies were used. The data was collected using observations taken from the researcher's field notes of the gaming lessons as well as vocabulary tests, in-game chat, and interviews. The basic structure of this research was guided by case study procedures; however, it was also necessary to use aspects of participant observations due to the researcher also being a participant in the research. The researcher designed this research attempting to limit the influence of biases. However, it is acknowledged that the choice of the design of this research has been influenced by perceptions and experiences which are unique to the researcher.

### **3.3 Case Study**

In this research data will be collected and analyzed using several different methods. As outlined above collecting data in this way has allowed the researcher to develop layers of understanding. Due to this the researcher selected a case study methodology. A case study (Sturman, 1994 as cited in Bassey, 1999) is;

“a generic term for the investigation of an individual, group or phenomenon.

While the techniques used in the investigation may be varied, and may include

both qualitative and quantitative approaches, the distinguishing feature of case study is the belief that human systems develop a characteristic wholeness or integrity and are not simply a loose collection of traits. As a consequence of this belief, case study researchers hold that to understand a case, to explain why things happen as they do, and to generalise or predict from a single example requires an in-depth investigation of the interdependencies of parts and of the patterns that emerge.” (p.61)

For this research project, a multiple case study methodology was used (Bassey, 1999). The six participants who participated in this research are considered six individual case studies. These participants volunteered to participate in this project after being provided with a detailed description of the research’s requirements and goals. Each participant is unique, and as such the researcher was able to gain a more in-depth understanding of each individual before making any comparisons to other group members.

In qualitative research, an appropriate sample size is a matter of judgment based on experience and the research design (Sandelowski, 1995). Johnson and Christensen (2012) point out that the best sample size is that which meets the purpose of the research and will assist in answering the research question. The researcher believes that with six individual case studies, a large amount of data was collected over the 11 weeks, meaning that this number fulfills the requirements to make this study valid. In addition, many GBL studies with a varying number of participants (Thone, 2008; Peterson, 2010; Ferreira, Gouin-Vallerand, & Hotte, 2016; Chen, Chen, & Dai, 2018) have used a case study methodology as the basis for analysis. An advantage of using a case study methodology in this research is that it is already established as a reliable research methodology in GBL research. A further advantage is that case studies allow for the triangulation of several sets of data results to enhance the reliability of the research. The current research collected data from several sources; surveys, chats,

observations, and field notes. As such there was a need to analyze the data from each source before investigating the results as a whole.

### **3.4 Participant-Observer**

In this research, was essential that the participant-observer approach was utilized (Angrosino, 2005; Pattion, 2015). Although not a teacher at the institution where this research took place, the participants may have viewed the researcher as an authority figure, thus, issues of power are apparent. While recognizing the potential for participants to feel pressure to perform with an authority figure, the following measures were taken to minimize participants' feelings of vulnerability. Participants were explicitly told that the gaming class sessions were not a regular class. The rules that they must follow keeping their voices at a reasonable level, sitting in a specific order, and the like did not be apply during the game playing sessions. It was made clear to students that rules related to physical abuse or bullying were to be enforced. The researcher endeavored to create a relaxed environment, free of stress and anxiety. Participants did not get into trouble if they did not play the game but instead decided to do something else within the classroom's confines.

### **3.5 Context**

With all methodologies, it is essential to consider the context. Context is related to several aspects of backgrounds; historical, cultural, physical, social, economic, and sometimes political (Stake, 2005). Below, the historical, cultural, physical, and social contexts related to this research will be addressed.

The historical context for this research has been influenced by the researcher's own experience teaching all levels of students over the past 17 years in the post-WWII educational system in Japan. As outlined in chapter two, historically Japanese classrooms have been very teacher-centered, with little technology use and only limited interaction between teachers and students. This research differs from this context, as students were empowered by making

them an active part of their own learning process and the learning process of others. In addition, this research project has been influenced by the Japanese education system's cultural context with a stated desire to produce students with spoken English communicative competence. Formal education systems in Japan find it difficult, if not impossible, to move away from the grammar-translation method of teaching English, a known suppressant of spoken English. The researcher is aware of the desire of MEXT to increase students' communicative competence, and while the students probably are not, it is assumed as they are taking an optional English class that they wish to improve some aspect of their English communicative competence.

### **3.6 Addressing the Research Questions**

This study involved an 11-week research project designed to investigate the following questions that emerged from the discussion in the previous chapter:

1. Does task-based interaction in a COTS digital game facilitate TL vocabulary use?
2. What differences in in-game interaction are observed between male and female participants?
3. How does student perception of GBL develop during the research period?  
Furthermore, what are the reasons for the changes (if any)?
4. What potential opportunities presented through the gaming sessions, if used in a traditional classroom setting, could improve TL use?

### **3.7 Minecraft**

Minecraft (Minecraft.net) is a digital game in which the player has the ability to interact with the game by creating objects with blocks. These blocks can be acquired through mining resources and can be combined together or refined to make different type of blocks for a variety of purposes. The game itself has two modes of play, survival and creative. In the survival mode the player can encounter game generated creatures such as creepers, zombies,

and giant spiders that have the ability to kill the player. Creative mode in contrast is more peaceful and any creatures that do appear do not cause harm to the player. Figure seven and eight provide two examples of the Minecraft world the students used.

**Figure 7**

*Minecraft World Example One*



**Figure 8**

*Minecraft World Example Two*



There are several reasons this game was selected. Firstly, Minecraft allows for in-game chat between participants and the researcher could retrieve a log of the chats for analysis. Secondly, a local server could be used which allowed the students to participate in the university and avoid the firewall that prevents games being played on campus. In addition, Minecraft was selected as original tasks could be developed and administered as there is no need to complete any game tasks to increase your level. Finally, Minecraft was selected as it has been proven to be an effective means of GBL in previous studies (Chien, 2019; York, 2019; Abbott, 2019). For the above reasons the researcher selected creative mode in Minecraft for this research. The next section will provide further information on the weekly tasks that were used in Minecraft for this research.

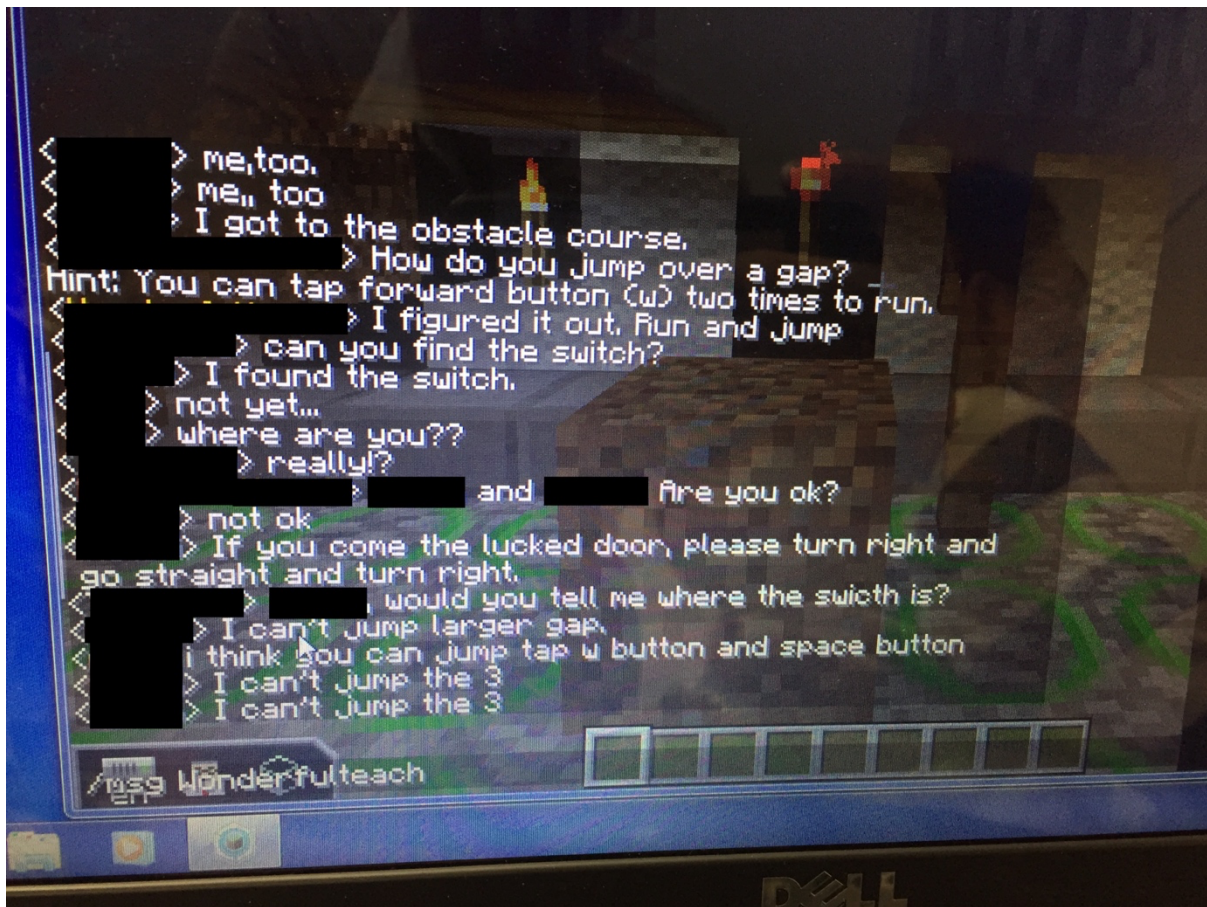
### **3.7.1 Weekly Tasks in Minecraft**

This research occurred over an 11-week period. In week one, an information session was held in which the students were told about the purpose of the research in English and received some information in both English and Japanese. The students were given an opportunity to ask questions and were then given a consent form that was in both Japanese and English to read and sign (see Appendix one). In weeks two and three the students took part in a Minecraft orientation session in which the students made their Minecraft account, selected their skin, participated in a Minecraft tutorial exercise, and also has time for free play. From week four, seven gaming sessions were held. In these sessions, the students had the task to make a virtual university within the game by communicating with each other in written English through the chat function. In Figure nine an example of the chat conversation can be seen, and an example of the tasks used in the research can be found in Appendix two.



**Figure 9**

*Minecraft In-Game Chat*



The students were not told how they should communicate together, just that the communication should be through the chat function and not verbally. The researcher had planned for each group to complete a new task, that is a new building of the university each week. However, it became apparent after week one that this would be impossible given the lack of previous gaming experience of the students. The researcher reduced the number of tasks, only administering a new activity once the previous one had been completed. The students were also provided with two lists of vocabulary. The first list was related to university vocabulary they might encounter while completing the tasks (Appendix three), and the second was a list of Minecraft vocabulary (Appendix four). The vocabulary lists were included as supplementary material and were used for self-study. Each list had an area for the

student to include a Japanese definition as well as a definition. There was also additional space for students to add extra vocabulary

The research was conducted in a laboratory with the six computers lined up, side by side along a wall, see Figures 10 and 11 for examples. This was the only configuration available that could prevent the students from using nonverbal communication to complete the tasks. The research was concerned that if the computers face each other than the students might try to speak to each other about aspects within the game.

**Figure 10**

Minecraft Gaming Sessions Layout Example One



## Figure 11

Minecraft Gaming Sessions Layout Example Two



### 3.8 Participants

A total of six students were observed during this research. With the small number of research participants, an individual case study methodology was selected as the most appropriate means of gathering layered data for analysis. All students in this research project were second and third grade university students at a large public university in Japan. A detailed outline of each student is available below, Table one.

**Table 1**

*Student Information*

Name	Age	Sex	Grade	Major
Student 1	20	M	2	Psychology
Student 2	20	F	3	Human Studies

Student 3	20	M	3	Education
Student 4	24	M	3	Education
Student 5	19	F	2	Psychology
Student 6	20	M	3	Education

The students have studied English at this university for differing periods of time and are of differing English levels. All students have some level of formal English assessment. However, the type and time of these assessments differ among students. Thus, it is not easy to make any sweeping generalizations as to their English level. However, as the researcher has 17 years' experience as an English educational specialist with Japanese students, he was able to make presumptions based on both the students self-reported English level and the assessment of their ability from the pre-research interviews. Students selected this class as part of their optional English language-learning classes. The students' real names are known to the researcher but will not be used in any publications or presentations arising from the research. At the beginning of the research project, all students were assigned a number, and it is this number that will be used in any publications or presentations. The students who participated in the research were not made aware of their allocated numbers.

In addition, students in this study were asked to take a pre-gaming session survey on their understand of GBL, Minecraft and their perceptions for English language learning. Some of the questions would be repeated in the post gaming session survey to be discussed in chapter six. In total the students were asked 39 questions which was followed by an informal interview by the researcher. The interview was necessary to see if the reported English language level of student was correct. An example of this survey is located in Appendix five.

**3.8.1 Student One**

As Table one shows, student one was a second-grade undergraduate student studying psychology. His pre-study questionnaire results are presented in Table two which will now be summarized in conjunction with addition information gathered from an informal interview

conducted by the researcher in week one. Firstly, student one stated that Japanese is his stated native tongue. He did not use any English in his daily life, including at his part-time job. This means that his current English level is based upon the formal English education he received in Japan, seven years, and also the English he has learned informally through music and books. At the start of the research, he rated himself as average in his English listening, reading, writing, and speaking skills. In relation to his gaming experience student one stated that he had some gaming experience in the form of mobile games, that is games on smartphone devices. He also stated that he enjoyed playing action-adventure games, role-playing games, and simulation games which are not all mobile based. He began to play video games when he was between six to ten years old and spends approximately 30 minutes per day playing them which is below the average reported by Bolliger et al. (2015). From the above it can be concluded that student one has a pre-intermediate English level overall and would be considered a casual gamer with a good understanding of basic game mechanics across platforms.

Table two demonstrates that student one was positive about the results of GBL and participating in this study. Student one agreed that it was possible and interesting to learn English through games. In addition to this, he thought that he would learn English better and more efficiently through playing games. This indicates that student one came into this research with a positive mindset and was hopeful of improving his English through playing games. In relation to specific skills, student one was more neutral. He did believe that his English listening skills could improve through playing games, but he was neutral in relation to his reading and writing skills, and negative when asked about possible improvements in his speaking skills. These answers are somewhat contradictory considering his positive answers to previous statements, however, it was possible that for this student listening was the most challenging English skill to master and he hoped to improve his listening through playing the

games. For the final two statements we can see that student one was motivated to learn English through games and believed he could improve his overall standard of English.

**Table 2**

*Student One Pre-Study Questionnaire Results*

Pre-study questionnaire	Answer
1. It is possible to learn English through playing games in English.	A
2. It will be interesting to learn English through games	A
3. I learn English better through games	A
4. I learn English faster through games	A
5. My English listening skill will improve after playing games in English	A
6. My English reading skill will improve after playing games	N
7. My English writing skill will improve after playing games	N
8. My English speaking skill will improve after playing games.	N
9. I will be more interested and motivated to learn English through games.	A
10 I will be able to improve my standard of English through games.	A

*Note.* SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, and SD = Strongly Disagree

**3.8.2 Student Two**

As shown in Table one, student two was a third-grade undergraduate student studying human studies. In her pre research informal interview she stated that Japanese was her stated native tongue, and that she did not use any English in her daily life, including at her part-time job. This means that her current English level was based on her seven years of formal English education with the only reported input from any informal sources being informally through watching television in English. At the start of the research, she rated herself as average in his English listening, reading, and speaking skills and poor in English writing skills. In relation to gaming experience student two stated that she had some gaming experience in the form of mobile games. She stated that she enjoyed playing simulation games. She began to play video games when she was between 11 to 15 years old and spent approximately 30 minutes once a week playing them. This would place her below average in terms of time spent playing games

and indicates that she was an occasional gamer. She would also be considered pre-intermediate level across the four skills.

Table three demonstrates that student two had mixed feelings about the results of GBL and participating in this study. While she agreed that it would be possible to learn English through games and strongly agreed that it would be interesting, she was neutral in relation to learning English better from games and disagreed that she would learn English faster through games. This shows that student two came into this research with a degree of anxiety as to the actual benefits of this informal learning activity but also a strong sense of interest. Student two believed that her listening and speaking skills could improve from this GBL activity but did not believe her reading or writing could improve. Even though student two is apprehensive about the benefits in comparison to formal English education she could still see an opportunity for her listening and speaking to improve. For the final two statements student two had a positive response. She both believed that she would be more motivated to learn English through games and that her standard of English will improve. Student two had a positive perception of what would happen in this research and although she was not convinced that she would learn any better or faster, she did not believe that she will be more interested and motivated.

**Table 3**

Student Two Pre-Study Questionnaire Results

Pre-study questionnaire	Answer
1. It is possible to learn English through playing games in English.	A
2. It will be interesting to learn English through games	SA
3. I learn English better through games	N
4. I learn English faster through games	N
5. My English listening skill will improve after playing games in English	A
6. My English reading skill will improve after playing games	D
7. My English writing skill will improve after playing games	D
8. My English speaking skill will improve after playing games.	A
9. I will be more interested and motivated to learn English through games.	A

10 I will be able to improve my standard of English through games. A

*Note.* SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, and SD = Strongly Disagree

### 3.8.3 Student Three

Table one shows that student three was a third-grade undergraduate student studying education. From his pre research interview we can observe that Japanese was his stated native tongue. In addition to this student three stated that he did not use any English in his daily life, except for his part-time job. As well as his seven years of compulsory English education student three learned English formally at an English conversation school and informally through his part-time job. At the start of the research, he rated himself as average in his English listening and writing skills. He also believed that he was good at his English reading skills but poor at his English-speaking skills. In relation to gaming experience student three stated that he did not have gaming experience and as such did not like any particular game type. Student three stated that he did not play games at all. This would make him a non-gamer and place him at a pre-intermediate English level.

Table four shows that in general student three thought positively about the results of playing games to learn English. He agreed that it was possible to learn English through games and strongly agrees that playing games to learn English would be interesting and be better for his English language learning. He did however disagree that he would will learn English faster through games. This indicates that in the opinion of student three a more formal or traditional language learning environment would help him learn English quicker. In relation to specific skills student three was negative as he disagreed that any of the four skills could be improve through playing games. Student three was also neutral as to whether learning through games would provide motivation and interest to learn. However, even after stating this, he still believed that he would be able to improve his overall standard of English through playing games.



**Table 4***Student Three Pre-Study Questionnaire Results*

Pre-study questionnaire	Answer
1. It is possible to learn English through playing games in English.	A
2. It will be interesting to learn English through games	SA
3. I learn English better through games	SA
4. I learn English faster through games	D
5. My English listening skill will improve after playing games in English	N
6. My English reading skill will improve after playing games	D
7. My English writing skill will improve after playing games	D
8. My English speaking skill will improve after playing games.	D
9. I will be more interested and motivated to learn English through games.	N
10 I will be able to improve my standard of English through games.	A

*Note.* SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, and SD = Strongly Disagree

**3.8.4 Student Four**

As shown in Table one, student four was a third-grade undergraduate student studying education. In his pre survey questionnaire he stated that Japanese was his stated native tongue. In regard to English he stated that he did not use any English in his daily life at all. However, he did learn informally through music, television, and self-study materials. From this the assumption can be made that his current English level is based on seven years of formal English education as well as some current informal learning. At the start of the research, he rated himself as poor in his English listening, writing, and speaking skills, average for his English writing skills. Generally, student four had a low self-evaluation of his English abilities. He also stated that he had no experience playing games and did not like any particular type of game. This made student four a non-gamer with advanced beginner to pre-intermediate English language ability.

Table 5 shows that student four had a high perception for the possibilities of GBL. He strongly agreed that it would be possible and interesting to learning English through playing games. He also was of the opinion that he would learn English better and faster through games. This highlights the positive beliefs of student four and that he was hopeful of

improving his English ability through playing games. For the specific skills of listening, reading, writing, and speaking student four strongly agreed that playing games would help him improve his listening and reading skills but was more neutral when considering his writing and speaking skills. Student four also answered strongly agreed to the statements about motivation and interest to learn English through using digital games compared to formal methods of learning. He also agreed that he would be able to improve his standard of English through games.

**Table 5**

Student Four Pre-Study Questionnaire Results

Pre-study questionnaire	Answer
1. It is possible to learn English through playing games in English.	SA
2. It will be interesting to learn English through games	SA
3. I learn English better through games	A
4. I learn English faster through games	A
5. My English listening skill will improve after playing games in English	SA
6. My English reading skill will improve after playing games	SA
7. My English writing skill will improve after playing games	N
8. My English speaking skill will improve after playing games.	N
9. I will be more interested and motivated to learn English through games.	SA
10. I will be able to improve my standard of English through games.	A

*Note.* SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, and SD = Strongly Disagree

### 3.8.5 Student Five

Table one shows that student five was a second-grade undergraduate student studying psychology. During the pre-research interview it was established that Japanese was her native tongue. Student five stated that she did not use any English in her daily life but did occasionally use English to communicate with foreign exchange students at university. Student five has learned English informally through music and books. From this information the assumption can be made that student five has had seven years of formal English education in addition to various opportunities for informal English language learning. At the start of the research, student five rated herself as average in her English listening and writing skills. She

also believed that she was poor at English speaking skills, but good at English reading skills. In relation to gaming experience, student five stated that she had no gaming experience that she could recount. From the above the assumption can be made that student five is a pre-intermediate English language learner and a non-gamer. Student five has been classified as pre-intermediate even though she stated that her English-speaking skill was poor. During the interview it became apparent to the researcher that she was underestimating her speaking ability. The researcher evaluated her as an average English speaker.

Table six shows that student five was positive about the results of both GBL and participating in this study. Student five agreed to the statements that it is possible to learn English through games and that it would be faster to learn through games. She also strongly agreed with the statements that it would be interesting to learn through games and that she could learn better through games. This demonstrates that student five was highly motivated by the idea of using games for English language learning in this research. In reference to specific skills here answers are mainly positive. She agreed that playing games in English would assist her in improving her listening, reading, and speaking skills. However, she strongly disagreed that they would improve her writing skills. The researcher believes that this strong disagreement with this statement was due to a lack of understanding of what is required when playing a game. Due to her lack of game experience she may not have realized how much communication relies on writing skills. However, it could be that she generally did not think games, even when writing was required, could improve her writing ability. Student five also disagreed with the statement that she would be more interested and motivated to learn with games than in a traditional setting. However, she agreed that playing games might improve her English ability. This shows that even though student five can see the benefits of using games she still is of the belief that a more traditional method of language learning is preferable.

**Table 6**

## Student Five Pre-Study Questionnaire Results

Pre-study questionnaire	Answer
1. It is possible to learn English through playing games in English.	A
2. It will be interesting to learn English through games	SA
3. I learn English better through games	SA
4. I learn English faster through games	A
5. My English listening skill will improve after playing games in English	A
6. My English reading skill will improve after playing games	A
7. My English writing skill will improve after playing games	SD
8. My English speaking skill will improve after playing games.	A
9. I will be more interested and motivated to learn English through games.	D
10 I will be able to improve my standard of English through games.	A

*Note.* SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, and SD = Strongly Disagree

**3.8.6 Student Six**

As shown in Table one, student six was a third-grade undergraduate student studying education. In his pre-research interview, he stated that Japanese was his stated native language. Student six said that he did not use any English in his daily life except with foreign exchange students. However, he has learnt English informally through music, television, and games. This means that his current English level was based on the seven formal years he received in the Japanese education system and some informal learning as well. Encouragingly for this research student six stated that one of his informal methods of learning English was from games. At the start of the research, he rated himself as poor in his English listening, writing, speaking, writing skills. The researcher was in agreement with this assessment after conducting the interview. In relation to his gaming experience student six stated that he had some experience playing games. Most of the games he played were on his mobile device and not on a console or computer. He did not however elaborate as to which types of games he preferred to play. From the above, the researcher was able to classify student six as a high beginner and a low frequency gamer.

Table seven highlights that student six was positive in relation to the understanding of GBL and his participation in this study. Student six indicated that he agreed with the statements that it was possible to learn English through games and that he could learn English faster through games. He also strongly agreed with the statements that learning English through games would be interesting and that he could learn better. Based on the pre survey interview this result was somewhat expected. It does highlight the positive attitude student six has toward GBL and this research. Student six was also very positive in regard to the benefit to specific skills through GBL. For listening, reading, and speaking he agreed with the statement that GBL could improve them, while he strongly agreed in relation to writing. In addition, student six strongly agreed that it would be more interesting and motivating to learn through games than conventional methods of learning and agreed that his standard of English could improve through learning with games.

**Table 7**

*Student Six Pre-Study Questionnaire Results*

Pre-study questionnaire	Answer
1. It is possible to learn English through playing games in English.	A
2. It will be interesting to learn English through games	SA
3. I learn English better through games	SA
4. I learn English faster through games	A
5. My English listening skill will improve after playing games in English	A
6. My English reading skill will improve after playing games	A
7. My English writing skill will improve after playing games	SA
8. My English speaking skill will improve after playing games.	A
9. I will be more interested and motivated to learn English through games.	Strongly agree
10. I will be able to improve my standard of English through games.	Agree

*Note.* SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, and SD = Strongly Disagree

### 3.9 Analysis

As was observed previously, the analysis of the data from this research project occurred in several ways, as outlined below. The analysis was first conducted for each individual as a case study (Bassey, 1999) and then as a group. By conducting the analysis both on individual case studies and groups, the researcher hoped to gain layers of understanding, which would, in turn, assist in answering the research questions. As was observed in chapter two, this study adopted a constructivist approach to SLA. In this research Stockwell's (2006) outline of three principles that are to be considered the primary principles of the social constructivist approach were discussed:

- 1) The individual forms their own representation of knowledge
- 2) Individuals learn through active exploration
- 3) Learning occurs within a social context, thus meaning interaction between peers is a necessity in the process of learning.

This study will be guided by these principles and by Guba and Lincoln (2005) and Denzin and Lincoln (2005, 2018) ontological position of relativism discussed previously in this chapter. To reiterate, this means that the realities of the world, as seen by the researcher, are facilitated by this sense and the means by which he engages with the world. As previously stated, reality is constructed by the individual, however the reality constructed by the individual may differ from other realities.

The researcher understands that there are many different realities in existence. In this research study, meaning was not discovered but constructed through the researcher's consciousness, understanding, interaction, and experiences with the world around him. The meaning constructed in this research is unique to the researcher, and he is aware that others may construct different meanings from the same research.

### **3.9.1 Analysis of Play**

Play (Piaget, 1962) was coded using an adaption of Rubin's (2001) play and non-play categories as introduced in chapter two. Using the play observation scale (POS) (Rubin, 2001) each five minutes of the gaming session was coded. The student's play behavior was placed into a play category based on the observations of the researcher (Appendix six). The researcher took field notes in relation to the reasoning for placing the students in each category. This was to ensure that he was able to reflect on the play category assigned to the student for that five-minute chunk of the gaming session and make changes to the category the student was assigned to post gaming session if he felt it was necessary. As this classification was undertaken by a single coder it possible that other interpretations of how each individual was categorized could take place. As outlined earlier in this chapter, there are no clear guidelines as to the correct number of coders at the PhD level (Richards, 2015). Thus, the researcher believes that he was consistent in his interpretation and classification of play during the gaming sessions and could provide reliable data for interpretation.

As previously defined in chapter two, there are three main categories of play, social, cognitive, and non-play behavior. A summary of these categories and their subcategories is provided below in Table 8.

### **Table 8**

#### *Rubin's (2001) Play Observation Scale (POS)*

---

##### 1. Social Play

A: Solitary Play :

B: Parallel Play:

C: Group Play:

##### 2. Cognitive play

A: Functional Play:

B: Constructive Play:

C: Exploration:

D: Dramatic Play:

E: Games-with-rules:

### 3. Non-play behaviors

A: Unoccupied behavior:

B: Onlooker behavior:

C: Transition

D: Active Conversation:

E: Aggression:

F: Rough-and-tumble:

G: Hovering:

H: Anxious Behavior:

I: Uncodable behavior:

J: Out of room:

---

Play was at first coded on an individual level and then as a group. Due to the case study nature of this research it was imperative that play was analyzed both ways as each layer of analysis provided a further level of understanding of play when playing digital games, and completing tasks, and using the chat function within Minecraft to communicate. Based on this analysis, the researcher was able to make conclusions related to how students played in particular game-related situations and how play changed during the gaming sessions on both an individual and group level. While analysis of play is an important focus for this research, it is not the only area of concern. The next section will continue to discuss the analysis techniques used in this research.

#### **3.9.2 Analysis of Interaction**

A second layer of analysis takes place through an analysis of the interaction which occurred during task related chat in the game. The transcripts, see Appendix seven, were analyzed to understand the pedagogical interaction of the language used during the gaming sessions. At first, the interaction was coded according to who or what the interaction was within the gaming sessions. As discussed in the literature in chapter two interaction was based on the work of Long's (1996) interaction hypothesis as well as studies of interaction between learners (Adams, 2007; Fernández-García & Martínez-Arbeláiz, 2002) which highlight that



interaction between learners has a positive effect on language acquisition. The categories of interaction were modified to meet the specific elements of this research study.

Interaction:

1. Student – self: The student verbally or in written chat form talks to themselves about the game or utters something game or non-related at the game playing session which is not directed at another student, the teacher, or the gaming console.
2. Student-gaming game: The student verbally or in written chat form talks to the game or computer about something related to the game.
3. Student-student (game mechanics-related): The student verbally or in written chat form talks to another student or students in the class about something related to the game.
4. Student-student (game task-related): The student verbally or in text form talks to another student or students in the class about something related to the game.
5. Student-student (game irrelevant): The student verbally or in written chat form talks to another student or students in the class about something not related to the game.
6. Student-teacher (game mechanics-related): The student talks verbally or in written chat form to the teacher in the class about something related to the game.
7. Student-teacher (game task-related): The student talks verbally or in written chat form to the teacher in the class about something related to the game.
8. Student-teacher (game irrelevant): The student talks verbally or in written chat form to the teacher about something not related to the game.

By coding each gaming session, the researcher analyzed how students interact pedagogically in a classroom setting when playing video games to complete in game tasks and interacting in English using the chat function. The analysis demonstrated in which situations ZPD developed to gain an understanding of the changes of ZPD throughout the 11-

week research, and how the students modified their output based on the type of input received. As shown above, the analysis of interaction will also play a major role in developing a layer of understanding in this research. A further layer will come from an analysis of the vocabulary used by the participants during the gaming sessions. A detailed explanation of this will be outlined below.

### **3.9.3 Analysis of Vocabulary**

Once play and interaction were coded, a descriptive analysis of the classes was undertaken. This aimed to explain how playing games and interacting using a text-based system has or has not been able to affect the vocabulary acquisition of the students who played them. In chapter two, a review of the process of vocabulary learning was provided. This demonstrated how CALL programs have been used to assist students learn English vocabulary with positive results (Brown & Culligan, 2008; Chen, Hsieh, & Kinshuk, 2008; Mills & Kennedy, 2013; Armstrong, 2020). In addition, in chapter two there was also a review of the hypothesized benefits of learning vocabulary through games (Chiu, Kao, & Reynolds, 2012; Tsai & Tsai, 2018; Jabbari & Eslami, 2018). This showed significant opportunities for language learning, including vocabulary, through interaction in the low anxiety environment provided by many digital games. This research attempted to gain an understanding of this phenomenon through an analysis of the chats and the vocabulary used. Using the <https://www.lex tutor.ca/> and <https://www.lex tutor.ca/vp/eng/> websites the researcher was able to analyze the weekly chats to understand the rank, frequency, and K-level, of the vocabulary used by the students. As outlined in Chapter two K-levels refer to 1000-word increments of English vocabulary with K1 being the most common 1000 words. Based on this analysis of vocabulary, the researcher could make some assumptions in relation to the vocabulary usage and learning of the students and the effectiveness of using digital games and written chat interaction for language learning. The researcher also investigated the

degree to which gender was a factor in this research. A description of the analysis technique is outlined below.

### **3.9.4 Analysis of Gender**

The final factor subject to data analysis concerned gender differences. In chapter two, the role gender has in games and games research was discussed. The discussion highlighted that males and females stereotypically play different types of games (Crain, 1996; Marsh & Young, 1998; Fredricks & Eccles, 2002), and as such, the type of interaction can be different. It was shown that girls tend to be more motivated to learn languages than boys (Dornyei et al. 2006). This analysis used play, interaction, and vocabulary, to cross analyze the six students in terms of gender differences. For play, the researcher looked at what type of play each gender is observed partaking in during the gaming session and cross-referenced this to see if there were any notable differences between the play observed and how the observed play changed over the course of the gaming sessions. For interaction, the research examined who and how each gender interacted during the gaming sessions and reported changes in interaction during the gaming sessions with specific reference as to if the interactions were game mechanics related or task related.

In this chapter the research methods, the design of the research, the research questions, were presented. In addition to this a description of Minecraft and the tasks used as the basis for communication between students were outlined. The chapter concluded with a detailed description of each case study participant. Using the above methods, the researcher collected data and analyzed it to draw inferences from both qualitative and quantitative methods to understand the research questions. The following chapters will now move on to explaining the results. It should be noted that the following results have been interpreted from the perspective of the researcher cannot be said to be the only interpretation that exists.

## **Chapter 4 Analysis: Play and Gender**

This chapter is the first of three results chapters. This chapter will relate to play with analysis conducted using the play observational scale (POS). This chapter will first review the understanding of play used in this research, which will be followed by an analysis of each case study and the group, including a discussion of the gender differences observed. As previously mentioned, this research is an interpretation of the data, as understood by the researcher. This chapter aims not to provide a definitive answer to the influence of play in GBL but to present an interpretation of it relevant to the discussion of the research questions answered in chapter eight.

### **4.1 Play**

In chapter two, play was discussed in detail and this chapter highlighted the positive effects that play can have on cognitive development (Csikszentmihalyi, 1990; Provost, 1990), social skills, and self-regulation (Leong & Bodrova, 2012). The literature reviewed in this chapter also highlighted that Japanese culture possess a unique type of play that has traditionally been more structured (Cox, 2002). It was suggested that in Japanese education there is a lack of play due to various elements, including the predominance of grammar-translation and teacher-centered instructional methods.

In chapter three, the structure of play analysis utilized in this research was introduced. Each gaming session was divided into five-minute periods. During this time, the students were observed by the researcher and placed into one of the play categories based on POS. As the research used a participant-observer approach, the researcher took field notes during the gaming sessions to review and confirm that participants were in the correct categories. A brief review of these categories is provided in chapter three, Table eight, and a full explanation of POS may be found in chapter two.

At first, an analysis of each individual's play over the seven gaming sessions was undertaken to allow for the analysis to occur from a case study context. After this, play was analyzed in the group context. The group context will demonstrate if and why the type of play changed over the seven gaming sessions and made predictions for which category of play created an effective student-centered environment for language learning to take place. In the following section, an analysis of the play of each individual case study will take place.

#### **4.1.1 Student One Play Analysis**

Student one was one of the male group members. In the pre-research survey presented in chapter three, this participant indicated that he did not use any English in his daily life and has only learned English informally through music and books. He also rated himself as average in his English listening, reading, writing, and speaking skills. Student one stated that he had some gaming experience in the form of mobile games. The researcher concluded from the pre-research information that student one was a pre-intermediate English language learner and a casual gamer. Being a casual gamer with no reported Minecraft experience, it was anticipated that the two Minecraft orientation sessions held before the gaming sessions would be sufficient for him to gain a functional understanding of Minecraft's game mechanics. This would allow him to focus on completing Minecraft assigned tasks through written chat-based interactions with his group members.

As can be seen from Tables nine and ten, the majority of student one's play in the seven 50-minute gaming sessions was observed to be group play. Group play was outlined in chapter two as a subcategory of social play in which participants play with other participants, and there is a common goal or purpose to their activity. Griffiths et al. (2011) reported that social interactions, such as those associated with group play, are essential aspects of any MMORPGs, such as Minecraft. The common goal in the gaming sessions was provided by the weekly tasks that involved communicating in written English within the chat function to

create a Minecraft university campus. Levy and Stockwell (2006), as reported in chapter two, suggest that learning as seen from a constructivist viewpoint occurs within a social context such as this, and highlights the interaction between peers, as occurring between student one and his group members, as crucial in the process of learning. In addition, Adams (2007) as noted in chapter two, emphasizes the benefit of NNS-NNS interactions, as occurred in the Minecraft chat, as being beneficial for second language development.

**Table 9**

*Student One Play Coding*

Time	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5	Lesson 6	Lesson 7
0 – 5m	SP	E	GP	GP	E	SP	SP
6-10m	E	GP	GP	GP	GP	GP	GP
11-15m	E	GP	GP	E	GP	GP	GP
16 – 20m	GP	GP	SP	GP	GP	GP	GP
21 – 25m	GP	GP	PP	GP	GP	GP	GP
26 – 30m	GP	PP	GP	GP	GP	GP	GP
31 -35m	SP	SP	SP	GP	CP	CP	GP
36 – 40m	CP	CP	CP	GP	CP	GP	GP
41 – 45m	GP	GP	GP	GP	GP	GP	GP
46 – 50m	GP	GP	GP	GP	GP	GP	GP

*Note.* SP = solitary play, PP = parallel play, GP = group play, E = Exploratory play, FP = Functional play, CP = constructive play, DP = dramatic play, GR = games with rules, R = reading, UP = unoccupied play, OB = onlooker behavior, T = transition, AC = active conversation, A = aggression, RT = rough and tumble

In Excerpt one, we can see an example of group play from the chat of student one that demonstrates the interaction between the students. Here student one and the other group members used Minecraft TL in discussing both the task of building the university campus and game mechanics of flying within the game. At this time in week two, student one was observed to be in a group play category. Based on the NNS-NNS interaction taking place during group play, the researcher predicted that group play would be one of the desirable play environments in which student-centered second language learning could occur.

## Excerpt 1

### *Student One Group Play*

- 
1. Student 1 (M) may I connect those blocks?
  2. Student 4 (M) of course thanks but its not precise sorry about
  3. Student 1 (M) ok!
  4. Student 4 (M) this line is difficult..
  5. Student 6 (M) I agree
  6. Student 1 (M) how about three or four blocks on the same lines?
  7. Student 4 (M) good !
  8. Student 4 (M) now looking from high not bad!
  9. Student 6 (M) how to fly?
  10. Student 1 (M) long space key
  11. Student 6 (M) thanks
- 

From a weekly perspective, we can see in Table 10 that in week one, four types of play were observed solitary play (two observations or 20%), group play (five observations or 50%), constructive play (one observation or 10%), and exploratory play (two observations 20%). As defined in chapter two, solitary play is a subcategory of social play in which a participant plays apart from other participants and is centered on his/her own activity. Given the social constructivist viewpoint presented above, that learning occurs within a social context through peer interaction, and in this case, NNS-NNS interaction, this is an unfavorable category for second language learning to take place. In addition, solitary play is often silent; thus, showing solitary play within the conversation data in this research was difficult as no chat took place.

In the case of student one, solitary play was observed seven times over the seven 50-minute gaming sessions. One example of solitary play is shown in Excerpt two below. This example, taken from the 31-35-minute timeframe of game session two, shows that student one believed the weekly task was finished and did not contribute to the conversation again within the five-minute timeframe. He then suddenly reenters the conversation around the 36th minute. During that timeframe, the researcher observed that student one was still playing

within the Minecraft environment but was not involved in the weekly task being discussed by the other students.

Solitary play was observed towards the start of the gaming sessions on three separate weeks for student one. While no concrete conclusions can be made as no data could be collected on this, some possibilities on why solitary play is observed at the start of gaming sessions exist. This finding may indicate a sort of weekly warming up period exclusive to student one. Student one may have needed some time to acclimatize to the Minecraft environment before engaging with other students on the task in English. It may also highlight how the week break between gaming sessions and the lack of classmate communication outside of the Minecraft environment created a brief period each week where student one needed to reacquaint himself with the other group members. Solitary play at the start of the gaming session could also be explained by the student's previous gaming experience and his English level. As outlined in chapter three, student one was classified as a casual gamer with no Minecraft experience. This suggests that having a week interval between gaming sessions may have been long enough for him to forget some of Minecraft's game mechanics. Also, it is likely given his pre-research information that student one did not use any English outside of the gaming sessions. Given the pre-intermediate level he was assigned, the length of time between gaming sessions may have led to solitary play as he switched from Japanese to English.

## **Excerpt 2**

### *Student One Solitary Play Example*

- 
1. Student 1 (M) thanks! maybe, finished
  2. Student 4(M) the pole is brick and wall is stone it more beautiful
  3. Student 4(M) and we make gate like a picture
  4. Student 6 (M) how do we make a gate?
  5. Student 4(M) Im gathering materials
  6. Student 4(M) where should we make windows....?
  7. Student 4(M) ummm



8. Student 1 (M) we need windows on every side ..?

The above rationale assumes that group play, and the social interaction between the NNS peers while completing tasks and chatting in English, is one of the most the social environments of the play categories of POS; the category in which student-centered language learning may occur when completing tasks in using the Minecraft chat in English. It was also encouraging from a language learning perspective and with thoughts of a hybrid classroom environment, to be discussed later in this thesis, to see that group play accounted for 71% of all observed play over the seven gaming sessions for student one. In contrast, solitary play only accounted for 7% of student one’s observable play. From a weekly analysis of play using POS for student one, the researcher observed that group play accounted for 50% of overall play in week one, 60% in weeks two and three, 90% in week four, 70% in week five, 80% in week six and 90% in week seven.

**Table 10**

*Student One Play Category Frequency*

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
<b>Social Play</b>							
Solitary play: (SP)	2	1	2			1	1
Parallel play: (PP)		1	1				
Group play: (GP)	5	6	6	9	7	8	9
<b>Cognitive Play</b>							
Functional play: (FP)							
Constructive play: (CP)	1	1	1		2	1	
Dramatic play: (DP)							
Games-with-rules: (GR)							
<b>Non-Play Behavior</b>							
Exploratory: (E)	2	1		1	1		
Reading: (R)							
Unoccupied behavior: (UB)							
Onlooker behavior: (OB)							
Transition: (T)							
Active conversation: (AC)							

Aggression: (A)

Rough-and-Tumble: (RT)

---

#### **4.1.2 Student two play analysis**

Student two was one of the two females in the research. In her pre-research survey, presented in chapter three, student two stated that she did not use English in her daily life and had only learned English informally through watching television. At the start of the research, she rated herself as average in his English listening, reading, and speaking skills, and poor in English writing skills. Student two stated that she had some gaming experience in the form of mobile games. However, she only played games for approximately 30 minutes every week. The researcher concluded from her pre-research information that she was an occasional gamer and a pre-intermediate English language learner. Being an occasional gamer with no previous Minecraft experience, the researcher was hopeful that the two Minecraft gaming orientation sessions would be sufficient for her to become accustomed to Minecraft's game mechanics.

As shown in Tables 11 and 12, observations of the 50-minute gaming sessions revealed that student two was involved in some group play in week one (30%) in the 21-35-minute zone. For student two, the remainder of week one was observed as solitary play (10%), exploratory play (40%), onlooker behavior (10%), and functional play (10%).

**Table 11***Student Two Play Coding*

Time	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5	Lesson 6	Lesson 7
0 - 5	E	E	E	SP	GP	GP	SP
6-10 m	E	GP	E	GP	GP	GP	GP
11-15m	SP	GP	SP	GP	GP	GP	GP
16 - 20	OB	GP	OB	GP	GP	GP	GP
21 - 25	GP	GP	GP	GP	GP	GP	GP
26 – 30	GP	GP	GP	GP	GP	GP	GP
31 -35	GP	CP	GP	GP	GP	GP	GP
36 – 40	FP	CP	FP	GP	GP	GP	GP
41 – 45	E	GP	E	GP	GP	GP	GP
46 - 50	E	GP	E	GP	GP	GP	GP

*Note.* SP = solitary play, PP = parallel play, GP = group play, E = Exploratory play, FP = Functional play, CP = constructive play, DP = dramatic play, GR = games with rules, R = reading, UP = unoccupied play, OB = onlooker behavior, T = transition, AC = active conversation, A = aggression, RT = rough and tumble

As outlined in the analysis of student one in the previous section, group play data suggests that student one was involved in social interactions within the chat function of Minecraft 30% of the time in week one. This student-centered NNS-NNS interaction has previously in this chapter been highlighted as being beneficial (Adams, 2007) or even crucial (Levy & Stockwell, 2006) to second language learning development. Besides from group play, student two also spent 40% of her time in exploratory play. As defined in chapter two, exploratory play focuses on examining an object to obtain visual information about its specific physical properties. In this research, exploratory play is where the participant may be examining an object on his/her screen in the game that is not directly related to the task but is still within the Minecraft environment. The researcher believes the difference between solitary play and exploratory play within the context of this research is that with exploratory play, NNS-NNS student-centered learning with Minecraft chat is still possible.

**Table 12***Student Two Play Category Frequency*

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
<b>Social Play</b>							
Solitary play: (SP)	1		1	1			1
Parallel play: (PP)							
Group play: (GP)	3	7	3	9	10	10	9
<b>Cognitive Play</b>							
Functional play: (FP)	1		1				
Constructive play: (CP)		2					
Dramatic play: (DP)							
Games-with-rules: (GR)							
<b>Non-Play Behavior</b>							
Exploratory: (E)	4	1	4				
Reading: (R)							
Unoccupied behavior: (UB)							
Onlooker behavior: (OB)	1		1				
Transition: (T)							
Active conversation: (AC)							
Aggression: (A)							
Rough-and-Tumble: (RT)							

Below is an extract of student two's conversation data, Excerpt three. Student two, at this time, is observed to be less focused on social interactions related to the Minecraft task information given by student three, and more interested in an examination of the flowers within the Minecraft environment. The flowers themselves are irrelevant to the Minecraft task assigned to the students, and as such, this NNS-NNS interaction can be classified as exploratory. Given that the exploratory play analyzed below has NNS-NNS social interactions within the Minecraft chat and that these interactions benefit second language learning (Adams, 2007), it is possible that English language learning took place as both students are engaging in English only interaction. This learning is more focused on the appropriate way to engage in small talk than ZPD, however this type of informal small talk is

an important aspect of English and practicing it in this environment is a non-threatening way in which students can build confidence.

### **Excerpt 3**

#### Student Two Exploratory Play

- 
1. Student 3(M) Hello
  2. Student 3(M) Teacher said today we need to finish making the ground
  3. Student 2(F) ok
  4. Student 5(F) ok
  5. Student 5(F) Look the flowers.
  6. Student 2(F) Pretty
- 

As outlined in chapter three, student two indicated on her pre-gaming session survey that she was not very experienced playing games and had no Minecraft experience. As such, the researcher classified her as a casual gamer. Even after two Minecraft orientation sessions, it is evident that student two used the first gaming session to further understand Minecraft's game mechanics. This is especially obvious from the 16-20 minute area where student two participated in observer behavior, which means she completely stopped participating in the gaming session and watched the other students. As shown in Excerpt four, student two requested game mechanics information from the researcher on how to stop flying. During this time, student two noticed that one of the other group members left the game. Instead of continuing with the task of making the building, student two observed the situation. While there were still NNS-NNS interactions during the observer behavior, the interactions were irrelevant to the Minecraft task assigned. The researcher believes that these off-task interactions, like group play, are social in nature and present second language learning opportunities through student-led NNS-NNS language learning. In addition, when considering a hybrid classroom, it could be argued that any NNS-NNS interaction in the TL, in this case, English, would be desirable, whether task-relevant or not.

## Excerpt 4

### *Student Two Observable Behavior*

- 
1. Teacher To stop flying (shift+space)
  2. Student 5(F) My PC stopped workng!
  3. Student 3(M) Why?
  4. Student 2(F) Thank you ! I did it!
  5. Student 2(F) You left the game?
  6. Student 5(F) I don't know.
  7. Student 5(F) I restarted !
  8. Student 2(F) Okey !
  9. Student 5(F) Sorry. I lost you again.
- 

The group play observations fluctuated from the second gaming session, with 70% in week two, 30% in week three, 90% in week four, 100% in both weeks five and six, and 90% in week seven. The researcher believes that being an occasional gamer with no Minecraft experience meant that the seven 50-minute gaming sessions, which had a week interval between them, was a significant determining factor in it taking four weeks (two orientation sessions and two gaming sessions) for student two to become accustomed to the game mechanics of Minecraft. This raises some issues regarding the procedures needed when considering a hybrid classroom, such as the need for an appropriate number of orientation sessions based on the students' gaming experience. However, as defined in this research, if group play is considered one of the most desirable environments for NNS-NNS student-led language learning, it was encouraging that group play was observed over 72% of the time.

#### **4.1.3 Student Three Play Analysis**

Student three was one of the male students in the research group. In his pre-research survey, outlined in chapter three, he reported that he did not use English in his daily life except for his part-time job. This indicates that he has the opportunity for informal English language learning when working. Student three reported that he was good at English reading skills, but poor at his English-speaking while he thought his listening and writing skills were average. Student three had no reported experience playing games and no experience using

Minecraft. The researcher concluded that student three was a pre-intermediate English language learner and a non-gamer for the purposes of this research. The researcher was unsure if the two Minecraft orientation sessions would be sufficient for student three to gain a full understanding of game mechanics and be able to participate in the weekly tasks sufficiently at first.

As seen in Tables 13 and 14, student three spent a significant amount of the gaming sessions in the group play zone, 82% in total over the seven 50-minute gaming sessions. As previously stated in this chapter, group play, as defined in POS, is where task-focused peer interaction in the TL can occur. Given the English level of student three, pre-intermediate, and being a non-gamer, it was encouraging to observe student three participating in NNS-NNS interactions (Adams, 2007) that could create the most desirable environment for student-led language learning.

**Table 13**

*Student Three Play Coding*

Time	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5	Lesson 6	Lesson 7
0 - 5	E	GP	GP	GP	GP	GP	E
6-10 m	E	GP	GP	GP	GP	GP	GP
11-15m	GP	GP	GP	GP	E	GP	GP
16 - 20	GP	GP	GP	GP	GP	GP	GP
21 - 25	GP	GP	GP	SP	GP	GP	GP
26 – 30	GP	GP	GP	GP	GP	GP	GP
31 -35	GP	GP	GP	GP	GP	GP	GP
36 – 40	GP	GP	GP	GP	GP	GP	GP
41 – 45	GP	GP	GP	GP	GP	GP	GP
46 - 50	SP	SP	SP	SP	SP	SP	GP

*Note.* SP = solitary play, PP = parallel play, GP = group play, E = Exploratory play, FP = Functional play, CP = constructive play, DP = dramatic play, GR = games with rules, R = reading, UP = unoccupied play, OB = onlooker behavior, T = transition, AC = active conversation, A = aggression, RT = rough and tumble

**Table 14***Student Three Play Category Frequency*

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
<b>Social Play</b>							
Solitary play: (SP)	1	1	1	2	1	1	
Parallel play: (PP)							
Group play: (GP)	7	9	9	8	8	9	9
<b>Cognitive Play</b>							
Functional play: (FP)							
Constructive play: (CP)							
Dramatic play: (DP)							
Games-with-rules: (GR)							
<b>Non-Play Behavior</b>							
Exploratory: (E)	2				1		1
Reading: (R)							
Unoccupied behavior: (UB)							
Onlooker behavior: (OB)							
Transition: (T)							
Active conversation: (AC)							
Aggression: (A)							
Rough-and-Tumble: (RT)							

An example of group play, a subcategory of social play in which participants play with other participants, and there is a common goal or purpose to their activity, can be seen in Excerpt five. Here student three was engaged in NNS-NNS task-based interactions with his group members. The conversation discussed the task of where to place the windows and doors of the building the group had created in Minecraft solely using the chat function in Minecraft to coordinate their task. This interaction between student three and his group members is typical in MMORPGs (Griffiths et al. 2011) and is considered crucial in learning (Levy and Stockwell, 2006). From a foreign language learning perspective, it is encouraging that student three was observed in group play for long periods, given his lack of gaming experience. When considering introducing a hybrid classroom, this type of result is also desirable as the student could enter and stay in the group play zone while completing English tasks in Minecraft for



long periods, even though he was a non-gamer. This researcher believes that this could be evidence that introducing a hybrid classroom is a viable solution to the English communication competence issues of Japanese as an introduction.

### **Excerpt 5**

#### Student Three Group Play

- 
1. Student 3(M) Let's get started
  2. Student 2(F) I remember!! The window problem
  3. Student 5(F) How about window gap door gap window
  4. Student 2(F) Last time we said 2 up and 2 across for the window.
  5. Student 5(F) yes....
  6. Student 3(M) The door is maybe 2 up 1 across
  7. Student 2(F) ok...I think we need to move the window
  8. Student 3(M) Sorry
  9. Student 5(F) So now window gap window gap door gap window
  10. Student 3(M) I think it is better. Maybe just move the right window.
  11. Student 2(F) I will try
  12. Student 3(M) Ok now I will add the door.
  13. Student 5(F) Looks good.
  14. Student 2(F) Do we need to move the window on other levels?
  15. Student 3(M) Look at the pictue. All the windows are same place.
  16. Student 5(F) I think it looks better. Lets move the right one
- 

#### **4.1.4 Student Four Play Analysis**

Student four was a male member of the group. In his pre-research survey in chapter three, he indicated that he did not use English in his daily life and only learned English informally through music, television, and other self-study materials. He stated that his written English level was poor, that he had no gaming experience, and did not know anything about Minecraft. The researcher concluded from his pre-research information that student one was an advanced-beginner English language learner and was a non-gamer. Being an advanced-beginner English language learner and a non-gamer, the researcher believed that student four might struggle to engage in the chat conversations with his group members, especially given his self-reported poor English writing skills.

As can be seen in Table 15 and 16 student three began week one with five minutes of exploratory play. As previously defined in the POS and this research, exploratory play is

where the participant may be examining an object on his/her screen in the game that is not directly related to the task but is still within the Minecraft environment. In this instance, he is exploring both Minecraft's game environment, trying to obtain visual information about the specifics of its physical properties and also exploring the mechanics. As outlined earlier in this chapter, exploratory play may elicit NNS-NNS student-centered language learning opportunities.

**Table 15**

*Student Four Play Coding*

Time	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5	Lesson 6	Lesson 7
0 - 5	E	GP	GP	GP	GP	E	GP
6-10 m	GP	GP	GP	GP	GP	GP	GP
11-15m	GP	GP	GP	GP	GP	GP	GP
16 - 20	GP	GP	GP	SP	GP	GP	GP
21 - 25	GP	GP	GP	GP	GP	GP	GP
26 – 30	GP	GP	GP	GP	GP	GP	GP
31 -35	GP	GP	GP	GP	GP	GP	GP
36 – 40	UB	GP	GP	GP	GP	GP	GP
41 – 45	AC	GP	GP	GP	GP	GP	GP
46 - 50	AC	GP	GP	GP	GP	GP	GP

*Note.* SP = solitary play, PP = parallel play, GP = group play, E = Exploratory play, FP = Functional play, CP = constructive play, DP = dramatic play, GR = games with rules, R = reading, UP = unoccupied play, OB = onlooker behavior, T = transition, AC = active conversation, A = aggression, RT = rough and tumble

**Table 16**

*Student Four Play Category Frequency*

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
<b>Social Play</b>							
Solitary play: (SP)				1			
Parallel play: (PP)							
Group play: (GP)	6	10	10	9	10	9	10
<b>Cognitive Play</b>							
Functional play: (FP)							
Constructive play: (CP)							

Dramatic play: (DP)  
Games-with-rules: (GR)

---

**Non-Play Behavior**

Exploratory: (E)	1	1
Reading: (R)		
Unoccupied behavior: (UB)	1	
Onlooker behavior: (OB)		
Transition: (T)		
Active conversation: (AC)	2	
Aggression: (A)		
Rough-and-Tumble: (RT)		

---

In the chat selection below, Excerpt six, we can observe exploratory behavior. Here, student four attempted to leave exploratory play by asking a question about the group's task. This is student four attempting to demonstrate the social skill of leadership, which in chapter two was highlighted as a positive effect of well-developed play (Leong & Bodrova, 2012) and has been observed in GBL previously (Gee, 2005). However, his call to move into group play and focus on the task was not successful as none of the group members understood the task to be completed. Student four, with little option but to continue with his exploratory behavior, decided to continue the development of his newly found leadership skills and encourage further exploration. As mentioned above, the researcher has assumed that under exploratory play, NNS-NNS student-centered language learning opportunities can indeed occur and thus should not be discouraged.

**Excerpt 6**

*Student Three Exploratory Behavior*

---

1. Student 4(M) where should we go?
2. Student 6 (M) Teacher didn't say
3. Student 1 (M) maybe, anywhere...?
4. Student 4(M) lets explore!
5. Student 6 (M) yes
6. Student 4(M) Would you follow me?
7. Student 1 (M) OK!
8. Student 6 (M) OK
9. Student 4(M) lets climb!
10. Student 4(M) im making stair

11. Student 4(M) found openly field!
12. Student 1 (M) what should we do?
13. Student 4(M) maybe create something
14. Student 6 (M) Create what?
15. Student 4(M) sorry lost you
16. Student 1 (M) me, too...
17. Student 4(M) dark...
18. Student 6 (M) We need light
19. Student 4(M) ill make landmark
20. Student 4(M) i made high tower
21. Student 6 (M) very high
22. Student 4(M) are you in wood?
23. Student 4(M) youre flying and in trouble ?
24. Student 1 (M) maybe...
25. Student 4(M) i see
26. Student 4(M) because of computers slow response. stop flying is difficult
27. Student 1 (M) i just go back to the ground!

---

From a weekly perspective, it was observed that group play was the most frequent category of POS play. In week one, group play was observed 60% of the time, 90% in weeks four and six, and 100% of the time in weeks two, three, five, and seven. From the social constructivist viewpoint, as illustrated by Levy and Stockwell (2006), and the importance of NNS-NNS interaction for language learning (Adams, 2007), we can see that this level of NNS-NNS interaction has created a favorable environment for student four in regard to second language acquisition. The fact that student four was observed in the group play category being an advanced-beginner English language learner may also provide evidence drawing attention to the low anxiety aspect of the interactional environment afforded by the game between lower-level learners such as student four and more advanced learners (Jabbari and Eslami, 2018). Excerpt seven shows an excerpt of group play involving student four from the start of week two. As shown below, student four instantly engages in group play by starting the chat with a task-related statement. This again highlights how the environment of chatting while completing tasks allows for social skills (Leong & Bodrova, 2012) such as leadership to develop as the environment has a low level of anxiety (Jabbari and Eslami,

2018). The NNS-NNS interaction that follows demonstrates that student four is active in the Minecraft chat and has created a favorable language learning environment.

### **Excerpt 7**

#### *Student Four Group Play*

- 
1. Student 4(M) lets make building!
  2. Student 1 (M) ok!
  3. Student 6 (M) ok
  4. Student 4(M) decide how large
  5. Student 4(M) our building is
  6. Student 6 (M) looks so big
  7. Student 4(M) triangle so,
  8. Student 6 (M) triangle
  9. Student 4(M) first make three point
  10. Student 1 (M) may I connect those blocks?
- 

In chapter two, it was noted that results of one meta-analysis study (Tsai & Tsai, 2018) suggested that for university students and those above the beginner level, the effect of using games to assist with vocabulary acquisition was more pronounced. In this instance, student four was thought to be an advanced-beginner English language learner based on his self-reported English language level and pre-research interviews with the instructor. However, based on his ability to engage in group play with his peers, results may indicate a higher level of English ability or that using chat to communicate with group members in Minecraft had a positive effect on his English communicative competence.

#### **4.1.5 Student Five Play Analysis**

Student five was one of the females in the research group. In her pre-research survey, student five rated herself as average in her English listening and writing skills. She also believed that she was poor at English speaking but good at English reading. She did not report any formal English language learning in the past but did acknowledge that she uses English to communicate with foreign exchange students at her university. Student five did not report any previous gaming experience and had no previous knowledge of Minecraft. From the above information the research classified her as an intermediate English language learner and a non-

gamer based on her lack of gaming experience. The researcher predicted that the two orientation sessions might not be sufficient for the learner to fully comprehend the games mechanics.

Using POS, we can observe in Tables 17 and 18, that student five spent a part of her first gaming session in the solitary play (10%) zone, group play (50%), and exploratory zones (40%). These three zones have been previously defined in chapter two and also earlier in the current chapter. The researcher believes that solitary play was due to student two attempting to figure out the game mechanics for a significant proportion of the first 50-minute gaming session. This would suggest that the two orientation sessions were insufficient for student five. Although she spent a concentrated chunk of the first session, 11-35 minutes, in the group play zone, the fact that she engaged in some solitary play suggests that she was still having issues with game mechanics in the first week.

**Table 17**

*Student Five Play Coding*

Time	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5	Lesson 6	Lesson 7
0 - 5	E	SP	SP	SP	SP	SP	SP
6-10 m	SP	PP	E	E	E	E	E
11-15m	GP	GP	GP	GP	GP	GP	GP
16 - 20	GP	GP	GP	GP	GP	GP	GP
21 - 25	GP	GP	GP	GP	GP	GP	GP
26 – 30	GP	GP	GP	GP	GP	GP	GP
31 -35	GP	GP	GP	GP	GP	GP	GP
36 – 40	E	GP	GP	GP	GP	GP	GP
41 – 45	E	GP	GP	GP	GP	GP	GP
46 - 50	E	GP	GP	GP	GP	GP	GP

*Note.* SP = solitary play, PP = parallel play, GP = group play, E = Exploratory play, FP = Functional play, CP = constructive play, DP = dramatic play, GR = games with rules, R = reading, UP = unoccupied play, OB = onlooker behavior, T = transition, AC = active conversation, A = aggression, RT = rough and tumble

**Table 18***Student Five Play Category Frequency*

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
<b>Social Play</b>							
Solitary play: (SP)	1		1	1	1	1	1
Parallel play: (PP)		1					
Group play: (GP)	5	8	8	8	8	8	8
<b>Cognitive Play</b>							
Functional play: (FP)							
Constructive play: (CP)							
Dramatic play: (DP)							
Games-with-rules: (GR)							
<b>Non-Play Behavior</b>							
Exploratory: (E)	4	1	1	1	1	1	1
Reading: (R)							
Unoccupied behavior: (UB)							
Onlooker behavior: (OB)							
Transition: (T)							
Active conversation: (AC)							
Aggression: (A)							
Rough-and-Tumble: (RT)							

From lesson two to lesson seven, student five spent 80% of her time each week in the group play zone, which through NNS-NNS interactions, created a favorable environment for second language learning to occur while interacting to complete the tasks Minecraft. In Excerpt 8, we can see an example of exploratory play from student five in week one. Here, student five is participating in a conversation that is related to the environment of Minecraft, that is discussing where the group members are in the world and is thus classified as exploratory play as it does not directly relate to completing the task. As with group play, there are opportunities for language learning to take place within exploratory play. As previously mentioned in this chapter, exploratory play could also be welcome in a hybrid classroom environment as the students are engaged in NNS-NNS interaction that is considered important in the language learning process.

## Excerpt 8

### *Student Five Exploratory Play*

- 
1. Student 2(F) Where are you?
  2. Student 3(M) I don't know.
  3. Student 5(F) I am also looking for you.
  4. Student 3(M) I am near water.
  5. Student 5(F) I put on a purple shirt.
  6. Student 2(F) I lost the way...
- 

#### **4.1.6 Student Six Play Analysis**

Student six was a male member of the group. In his pre-research survey information outlined in chapter three, student six indicated that he did not have any formal English training and did not use English in his daily life except to communicate with foreign exchange students. Student six learned English informally through music, television, and games. At the start of the research project, student six believed that his English writing skills were lacking. He rated himself as poor in his English listening, writing, speaking and writing. Through information obtained in the pre-research informal interview, the researcher classified him as a beginner English language learner. Student six did not provide any details of his gaming habits except that he played mobile games. Based on this information, he was classified as a casual gamer. Given his game experience, it was thought that the two weeks of Minecraft orientation sessions would be enough for him to understand the game mechanics. However, his English level was predicated to hamper his ability to communicate in English with the other group members during the tasks.

Looking at Tables 19 and 20, it can be seen that in the first gaming session, student six spent 50% of his time in the group play zone. He was in the exploratory play zone (20%), the active conversation zone (20%), and the solitary play zone (10%). Excerpt six above (see student four analysis) shows that student six explored the game environment for the first 15 minutes with his other group members. As previously mentioned in this chapter, exploratory play in terms of this research is considered a favorable environment for second language



learning as NNS-NNS interactions occur, which are considered crucial for language learning (Levy & Stockwell, 2006). Student six was observed in group play from the sixteenth to the thirtieth minute, which is again a favorable language learning environment as understood in this research.

**Table 19**

*Student Six Play Coding*

Time	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5	Lesson 6	Lesson 7
0 - 5	E	SP	SP	GP	GP	GP	GP
6-10 m	E	GP	GP	GP	GP	GP	GP
11-15m	E	GP	GP	GP	CP	GP	GP
16 - 20	GP	GP	GP	GP	GP	GP	GP
21 - 25	GP	GP	SP	GP	GP	GP	GP
26 – 30	GP	GP	GP	GP	GP	GP	GP
31 -35	GP	GP	GP	GP	GP	GP	GP
36 – 40	GP	GP	GP	GP	GP	GP	GP
41 – 45	AC	GP	GP	GP	GP	GP	GP
46 - 50	AC	GP	GP	GP	GP	GP	UB

*Note.* SP = solitary play, PP = parallel play, GP = group play, E = Exploratory play, FP = Functional play, CP = constructive play, DP = dramatic play, GR = games with rules, R = reading, UP = unoccupied play, OB = onlooker behavior, T = transition, AC = active conversation, A = aggression, RT = rough and tumble

**Table 20**

*Student Six Play Category Frequency*

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
<b>Social Play</b>							
Solitary play: (SP)		1	1				
Parallel play: (PP)							
Group play: (GP)	5	9	9	10	9	10	9
<b>Cognitive Play</b>							
Functional play: (FP)							
Constructive play: (CP)					1		
Dramatic play: (DP)							
Games-with-rules: (GR)							
<b>Non-Play Behavior</b>							
Exploratory: (E)	3						

Reading: (R)	
Unoccupied behavior: (UB)	1
Onlooker behavior: (OB)	
Transition: (T)	
Active conversation: (AC)	2
Aggression: (A)	
Rough-and-Tumble: (RT)	

---

However, from gaming sessions two to seven, student six spent 80 to 90% of his time in the group play zone. This seems to indicate that completing tasks within Minecraft through written chat with peers creates a low anxiety environment for NNS-NNS interaction allowing beginner learners such as student six to interact with more advanced learners without fear of making a mistake (Jabbari and Eslami, 2018). When looking at the seven-gaming sessions in total, it is encouraging that student six was observed in the group play zone of POS 87% of the time. From both a language learning and hybrid classroom perspective, this may provide some evidence for introducing games into the classroom to reduce anxiety and increase opportunities for students to use the TL while completing tasks.

This chapter to date has provided an individual analysis of the play observed in each case study. Thus far, the goal of the analysis has been to provide a layer of understanding that will assist in the later discussion of the research questions. A further analysis of play in terms of the group and gender will now be presented.

#### **4. 7 Group Play Analysis**

Play will now be analyzed at the group level. Group play (GP) (Table 21) will now be analyzed at a group level. As defined in POS in chapter two, group play is a subcategory of social play in which participants play with other participants, and there is a common goal or purpose to their activity. Being social, it is likely that this zone provides a favorable environment in which student-centered NNS-NNS language learning could take place. In terms of this research, group play is a category in which students engage in written English chat within Minecraft with the goal of completing the weekly tasks collaboratively. Group

play accounted for the most significant amount of activity in total over the seven gaming sessions. This demonstrates that completing Minecraft tasks and engaging in written English chat with group members could provide a setting in which students engage in NNS-NNS interactions in English and creates an environment where language learning may occur.

**Table 21**

*All Students Social Play (Group Play)*

	S1(M)	S2(F)	S3(M)	S4(M)	S5(F)	S6(M)
Week 1	5	3	7	6	5	5
Week 2	6	7	9	10	8	9
Week 3	6	3	9	10	8	8
Week 4	9	9	8	9	8	10
Week 5	7	10	8	10	8	9
Week 6	8	10	9	9	8	10
Week 7	9	9	9	10	8	9

As shown in Table 22, the frequency of group play generally increased from week to week, with weeks five to seven having the most observed group play instances. Due to the low anxiety environment, English language level appeared to have little to do with the ability to participate in group play. From analyzing all case studies, it would not be unmerited to suggest that group play is a favorable language learning environment and is observable within Minecraft when the correct prompts are given.

**Table 22**

*All Students Group Play Frequency*

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
<b>Social Play</b>							
Solitary play: (SP)	5	3	9	5	2	3	3
Parallel play: (PP)	0	2	1	0	0	0	0
Group play: (GP)	31	49	44	53	52	54	54
<b>Cognitive Play</b>							
Functional play: (FP)	1	0	1	0	0	0	0
Constructive play: (CP)	1	3	1	0	3	1	0
Dramatic play: (DP)	0	0	0	0	0	0	0
Games-with-rules: (GR)	0	0	0	0	0	0	0

<b>Non-Play Behavior</b>							
Exploratory: (E)	11	3	5	2	3	2	2
Reading: (R)	0	0	0	0	0	0	0
Unoccupied behavior: (UB)	1	0	0	0	0	0	1
Onlooker behavior: (OB)	1	0	1	0	0	0	0
Transition: (T)	0	0	0	0	0	0	0
Active conversation: (AC)	4	0	0	0	0	0	0
Aggression: (A)	0	0	0	0	0	0	0
Rough-and-Tumble: (RT)	0	0	0	0	0	0	0

#### **4.8 Gender Differences in Play**

Regarding gender differences, week one saw the least amount of group play, with student two (F) and five (F) being at the lower end of the group play scale. Transcripts and researcher observations presented in this chapter showed that the female students were attempting to understand game mechanics and thus spent less time engaging and interacting with the other group members on the tasks in the beginning. Considering the students' background information, this is not a surprising result. Student two (F) and five (F) reported little gaming experience. Two weeks of Minecraft orientation was insufficient and is one aspect that needs further investigation. As the project progressed, the female students engaged in more group play. From this, it can be suggested from a gender point of view that some of the male students had more task-related language-learning opportunities in the first two weeks of the gaming sessions because the interactions were mainly NNS-NNS. From week four, the total instances of group play within the gaming sessions significantly outweighed other types of play, with week four and five having 53 instances out of 60, week six 54 instances, and week seven 55 instances.

Solitary play, defined in chapter two, is a subcategory of social play in which a participant plays apart from others and is centered in his/her own activity (see Table 23 below). No classroom language learning data could be collected for comparison, but solitary play may occur less often in this context than in a classroom language learning context. Of course, this is an assumption, but the researcher made this estimation based on 17 years of

English language education experience with Japanese students. The cause of solitary play is also something that can not be definitively determined concluded from the current data. In relation to gender, after week one, there was no notable difference in observed solitary play between the genders.

**Table 23**

*All Students Social Play (Solitary Play)*

	S1(M)	S2(F)	S3(M)	S4(M)	S5(F)	S6(M)
Week 1	2	1	1	1	4	1
Week 2	1	0	1	0	0	1
Week 3	2	1	1	0	1	2
Week 4	0	1	2	1	1	0
Week 5	0	0	1	0	1	0
Week 6	1	0	1	0	1	0
Week 7	1	1	0	0	1	0

Exploration (Table 24) is defined in chapter two, as a focused examination of an object to obtain visual information about its specific physical properties. This type of play was the third-highest observable event within the gaming session. Transcripts in this chapter showed that exploration also provided language learning opportunities as students chatted with others or even by themselves about their environment. While not related to the task within Minecraft, the presence of exploration is something that should have been predicted, given that all the students had no previous Minecraft experience. Thus, everything encountered in the environment was a new experience for them. After week three, few observed instances of exploration and, overall, no significant gender difference regarding exploration were found. Exploration may have had little effect on students' overall language learning opportunities, but it is possible that those same exploration experiences may not have occurred in a language learning classroom.

**Table 24***All Students Cognitive Play (Exploration)*

	S1(M)	S2(F)	S3(M)	S4(M)	S5(F)	S6(M)
Week 1	2	4	2	0	1	2
Week 2	1	1	0	0	1	0
Week 3	0	4	0	0	1	0
Week 4	1	0	0	0	1	0
Week 5	1	0	1	0	1	0
Week 6	0	0	0	1	1	0
Week 7	0	0	1	0	1	0

**4.9 Summary of Play Analysis**

As defined by POS, play was used in this chapter to gain an understanding of the language learning opportunities afforded to Japanese students by interacting together in English within the chat function of Minecraft while trying to complete weekly tasks. Within the many categories of play, group play, exploratory play, and solitary play emerged as the most common observable categories of play. After analysis and discussion in this chapter, it is likely that both group play and exploratory play provide a favorable environment for NNS-NNS language learning to occur. Play in this research seemed to disregard English language level and previous game experience as all students were observed in these two categories, which required both interacting with the game and with the others within the chat function. Based on the analysis presented here, Minecraft appeared to provide an environment where anxiety is reduced, and language learning opportunities through play increased.

## **5. Analysis: Text Chat**

This chapter is the second of the three result chapters. This chapter will analyze the chat data to demonstrate how completing tasks in Minecraft and chatting in written English may have supported English language development. The discussion will first review the understanding of SLA accepted in this research, which will be followed by an analysis of each case study and the possible learning that may have occurred. After this, the group will be analyzed, including a discussion focusing on the gender differences observed relating to language development. As previously mentioned, this research is an interpretation of the data, as understood by the researcher. The goal of the analysis is not to provide a definitive answer as to the influence of play in GBL but to present an interpretation of it to allow for a discussion of the research questions to follow in chapter eight.

### **5.1 SLA Through Written Chat**

As stated in chapter two, Japan is an input-poor foreign language environment (Ota, 2009). Once students leave the classroom, they are rarely exposed to English input unless they specifically seek it out. This analysis will examine the data from a naturalistic perspective (Richards & Rodgers, 1994), that is, how SLA may occur incidentally through completing tasks and text chat in Minecraft. The researcher has investigated the chat interaction as interactions are "fundamental fact in classroom pedagogy" (Allwright, 1984, p.156). When learners attempt to produce comprehensible output during interaction, this output itself becomes a form of input for interlocutors. Hegelheimer and Chapelle (2000) believe that language-learning interaction should "help learners comprehend the semantics and syntax of input" and, also, "help learners to improve the comprehensibility of their own linguistic output" (Hegelheimer and Chapelle, 2000, p. 42)

### **5.2 Zone of Proximal Development (ZPD)**

In the analysis in this chapter, the researcher will highlight instances of the zone of proximal development (ZPD) (Vygotsky, 1978). As defined in chapter two, ZPD is the distance from where the student is at in their development process and where they could possibly be with the help of a more knowledgeable other. Through NNS-NNS collaboration and social interactions, the individual learner can complete functions that he/she would not be able to do independently. In this research, it was observed that students in the group acted as more knowledgeable peer assisting other students through using written English in the chat function in Minecraft.

In chapter two, Tsai and Tsai (2018) divided games into two types, drill and task based. As used in this research, Minecraft would be considered a task-based game where the students focus on problem-solving, decision making, and word meaning through interaction. This type of game allows the player to use language, in this instance, English, critical thinking, and problem-solving skills to achieve a goal. For this research, this means that students interacted in written English using Minecraft's chat function and utilized critical thinking and problem-solving skills in their L2 to complete the weekly tasks.

### **5.3 Student One Chat Analysis**

As outlined in chapter three, student one was one of the male case studies, a pre-intermediate English language learner, and a casual gamer with a good understanding of game mechanics. Analysis of his conversation data showed that student one was active from the first gaming session; he discussed both the game mechanics of Minecraft and the tasks that needed to be completed. However, from week two, student one was focused on completing the tasks using the TL and interacting with the group members using the chat function of Minecraft primarily when it was necessary to complete the task.



In chapter two, it was highlighted that learning negotiation skills using an L2 is one of the positive aspects of GBL (Shaffer, Squire, Haverson, & Gee 2005; Young, 2008 as cited in Pelletier 2009). The extract from student one's week one conversation, Excerpt nine, demonstrates how student one negotiates in written English through Minecraft's chat function with student four. Student one interacts with student four to decide on the building's location, (lines seven to nine), with student one taking on the role of a follower actively accepting the leadership role undertaken by student four. Given student one has gaming experience, it could be anticipated that he would use his gaming skills to take on this leadership role. However, as outlined in the literature, Japanese students can often opt for harmony and conformity over trying to stand out (Kobayashi, 2010). Due to this, student one may have been content to let student four undertake the leadership role to ensure group harmony. This shows that games have the ability to provide real-life skills, such as negotiation and social cohesion. While these could also be practiced in the formal classroom, doing so within the game environment allows for a lower level of anxiety (Jabbari & Eslami, 2018) and less fear than in many face to face contexts.

### **Excerpt 9**

#### *Student One NNS-NNS Negotiation*

- 
1. Student 1 (M) where are you??
  2. Student 4 (M) so, maybe you are sooooo far from me
  3. Student 4 (M) im flying
  4. Student 1 (M) can you see the mountain covered with snow?
  5. Student 4 (M) you!
  6. Student 1 (M) yeah!
  7. Student 4 (M) great so go to plain building
  8. Student 4 (M) Please follow me
  9. Student 1 (M) OK! let's go
  10. Student 4 (M) flying
  11. Student 4 (M) up is space key long
  12. Student 1 (M) thanks!
- 

In Excerpts 10 and 11, we can observe how student one receives assistance on a game mechanics issue from student four, internalizes the information, and with this new

understanding, assists student six with the same game mechanics information he has just received later in the gaming session. In Excerpt 10, student four tells student one how to fly by saying in line three “up is space key long”. Although student four's grammatical information is incorrect, student one is still able to negotiate the meaning of this information, internally correct it, and repeat it using a more grammatical correct utterance to assist student six in Excerpt 11, line three “long space key”.

**Excerpt 10:**

*Student One Receiving Help*

- 
1. Student 1 (M) OK! let's go
  2. Student 4 (M) flying
  3. Student 4 (M) up is space key long
  4. Student 1 (M) thanks!
- 

**Excerpt 11**

*Student One Giving Help*

- 
1. Student 4(M) now looking from high not bad!
  2. Student 6 (M) how to fly?
  3. Student 1 (M) long space key
  4. Student 6 (M) thanks
- 

There were also instances of ZPD in the interactions for student one. As outlined above and in chapter two, ZPD is where students work together to negotiate meaning and overcome language issues that they would not have been able to do by themselves (Vygotsky, 1978). In Excerpt 12, student one assisted student six with an unknown word. In line two student six acknowledged that he did not understand the word, “unlimited”, used by student four in line one. Student one then supplied student six with the missing definition at a level he believed student six would comprehend in line three. After this feedback, student six acknowledged his understanding of the definition provided by student one in line four. Within four utterances, new vocabulary has been presented, vocabulary recognized as too difficult, a request for a definition was made, and a definition was provided. After this brief interaction, the group members were able to continue with the task at hand As this interaction shows,

student six could understand the meaning of the word due to student one's English assistance and vocabulary knowledge. This shows a further possible benefit of using game tasks for language learning as the feedback is student-led and understanding may be rapid.

### **Excerpt 12**

#### *Student One ZPD Example*

- 
1. Student 4 (M) this world is so wide unlimited
  2. Student 6 (M) unlimited? What mean?
  3. Student 1 (M) No finish
  4. Student 6 (M) OK
- 

### **5.3.1 Student Two Chat Analysis**

Analysis reveal that, student two, one of the group's females, was consistently one of highest initiators of interactions. From the pre-research survey information in chapter three, the researcher determined that student two was an occasional gamer and had a pre-intermediate English level. She also stated that she had no Minecraft experience. As shown in excerpt 13, the student asked questions relating to game mechanics using the chat function at the beginning of the gaming sessions. In the extract below, we can see how student two was concerned with completing the tasks, in this excerpt, finding her group members in the Minecraft world and learning how to fly.

### **Excerpt 13**

#### *Student Two Game Mechanics Questions*

- 
1. Student 2(F) Where are you?
  2. Student 3(M) I don't know.
  3. Student 5(F) I am also looking for you.
  4. Student 3(M) I am near water.
  5. Student 5(F) I put on a purple shirt.
  6. Student 2(F) I lost the way...
  7. Student 5(F) Where should we build?
  8. Student 2(F) I think I'm in the forest
  9. Student 5(F) Me, too.
  10. Student 2(F) Hmm
  11. Student 3(M) Here
  12. Student 2(F) How can I fry??
  13. Student 5(F) I don't know.
  14. Student 5(F) sorry
  15. Student 5(F) I can't find anyone.
  16. Student 2(F) Me too..
-

Excerpt 14 below, shows an instance of ZPD for student two in which she was taught the correct spelling of a word by student three. In line one student two asks “can you fry?”. Student two instantly understood that fry was the incorrect verb for the situation from the context of the game environment. Student three used his understanding of English and used what he believed to be the correct verb in line three, “fly?”. As the interaction shows, based on that one-word confirmation request, student two, in line three, recognized her mistake and modified her output. It was impossible to know if this fry/fly mistake was one she had made outside the game environment. However, student two did not make the same mistake again during the gaming sessions, which would indicate that the feedback was successful. This type of conversation with one-word sentences and incorrect grammar would most likely be discouraged, marked incorrect, or missed by the teacher in a formal classroom setting. However, in a game-based language learning environment, even short and minor errors provide opportunities for NNS-NNS ZPD to take place.

#### **Excerpt 14**

##### Student Two ZPD Example

- 
1. Student 2(F) Can you fry?
  2. Student 3(M) fly?
  3. Student 2(F) Fly...I mistake.
  4. Student 5(F) No
  5. Student 5(F) Please tell me.
  6. Student 2(F) Oh sorry
  7. Student 2(F) Press the space button
  8. Student 2(F) Many times
- 

In another instance of ZPD shown in Excerpt 15, student two assumes the role of the more knowledgeable peer. In this interaction, the group was tasked with making the sports ground and surrounding seating area. There was a discussion as to whether the seating should be referred to as a floor or level. In line two, student two used her English knowledge to first correct student five’s use of “floor” with “level”. Based on this corrective feedback, student five in line three asked for reconfirmation for the correct usage based on the current context,

which was then provided by student two. After this, in lines five and six, both student five and student three acknowledged the word's correct vocabulary usage through an appropriate use of humor. As outlined in chapter two and previously in this chapter, the low anxiety environment provided by digital games such as Minecraft (Reinders & Wattana, 2014) compared to a formal classroom setting allowed student two to suggest a vocabulary correction, even when the nuance of the incorrect word was understandable. While student five could ask for more detailed information on the usage of the vocabulary to enhance her understanding, she appeared to trust student two's knowledge. Within a formal classroom context, interaction like this may not have been possible, and as such, student five may have been left with an incorrect understanding of the usage of the words “floor” and “level”.

### **Excerpt 15**

Student Two ZPD Example Two

- 
1. Student 5(F) Please make third floor
  2. Student 2(F) OK. Level 3?
  3. Student 5(F) Level or floor? Which is correct English?
  4. Student 2 (F) Level I think. Floor is for buildings I think.
  5. Student 3(M) Oh. Thank you teacher.... Haha...
  6. Student 5 (F) Student 2 teacher thanks you
- 

#### **5.3.2 Student Three Chat Analysis**

Based on student three's pre-research information, he was classified as a non-gamer and a pre-intermediate English language learner. The consistent nature of interactions over the gaming sessions suggests that student three was focused on completing the assigned tasks using the chat function and the TL within Minecraft. The analysis revealed that student three was involved in many task-based interactions that were purposeful and used the TL. As in the Excerpt 16, student three, line one, focuses his attention on using the TL to complete the assigned task, “I’m making outside with brick”, while occasionally engaging in more informal language and humor “Colorful haha” in line five.

## Excerpt 16

### *Student Three Game Chat Interaction*

- 
1. Student 3(M) I'm making outside with brick
  2. Student 2(F) I will use yellow
  3. Student 2(F) sandstone
  4. Student 5(F) Looks good.
  5. Student 3(M) Colorful haha
  6. Student 3(M) We have three tracks. How many more?
  7. Student 5(F) Maybe 3
  8. Student 2(F) OK
  9. Student 2(F) Same pattern?
  10. Student 3(M) Brick
  11. Student 2(F) Brick yes
- 

The example below shows a meaningful interaction in the TL between student three and student two when providing game assistance to each other. In line one, student three requested glass for building windows. However, student two did not know how to give glass to another student in Minecraft. Student three provided instructions on how to do this, and because of this, student two was successful in fulfilling the request. Student three acknowledged the request had been fulfilled. This type of student-centered interaction is common within GBL and provides students with opportunities for language use that may be difficult to replicate in a formal classroom setting.

## Excerpt 17

### *Student Three Game Assistance Interaction*

- 
1. Student 3(M) I don't have any glass. Can you give me some?
  2. Student 2(F) How do I give you some?
  3. Student 3(M) Long right click
  4. Student 2(F) OK.
  5. Student 3(M) Thanks
- 

Excerpt 18 provides an example of initiated correction. In lines four to six, student three corrects student five for using the word “stair” instead of “floor”. It is possible that student three learned the correct usage of floor from a previous interaction between student two and student five regarding the same word, and due to this, felt confident about correcting

student five. There are no other instances of incorrect use of these words in the gaming sessions which may indicate this interaction was successful.

### **Excerpt 18:**

Student Three Initiated Correction

- 
1. Student 5(F) How high
  2. Student 3(M) I cant see in the picture... Maybe five.
  3. Student 5(F) OK. Let's do 5!!
  4. Student 5(F) How do I put the second stair?
  5. Student 3(M) Second floor?
  6. Student 5(F) Yes. Second floor.
- 

### **5.3.3 Student Four Chat Analysis**

From the pre-research survey, we can see that student four was classified between as an advanced-beginner English language learner and a non-gamer. Examining the interaction, it was found that student four spent a large proportion of his time in week one acting as a leader to the other group members, guiding them on how to play the game. As Shaffer et al. (2005) suggest, being able to assume a leadership role is one of the affordances of many digital games that involve interaction and may be achieved in part due to the low level of anxiety student four felt in the virtual world of Minecraft. In Excerpt 19, it can be observed how student four led the group. Using the TL, he provided leadership to peers on what to do and where to go, see lines one and two. He also provides game-specific information on how to fly in line five. This student-led learning in the TL is something that is probably difficult to achieve in a classroom, especially for a lower-level English learner such as student four.

### **Excerpt 19**

*Student Four Game Chat Interaction*

- 
1. Student 4(M) great so go to plain building
  2. Student 4(M) Please follow me
  3. Student 1 (M) OK! let's go
  4. Student 4(M) flying
  5. Student 4(M) up is space key long
  6. Student 1 (M) thanks!
  7. Student 4(M) here is plain so down
  8. Student 4(M) todays task is building

9. Student 6 (M) May difficult
  10. Student 1 (M) yes, so where do we have to put blocks first?
  11. Student 4(M) ummmm..
  12. Student 4(M) anyway gather the material
  13. Student 4(M) by pixel teacher gave us
  14. Student 6 (M) Thank you
  15. Student 4(M) I hold now
  16. Student 4(M) OK!
  17. Student 1 (M) let's go!
  18. Student 4(M) let's gather 64 blocks
  19. Student 1 (M) me, too!
  20. Student 4(M) OK!
- 

From week two, student four's interactions became less prominent due to other students becoming more proficient in their tasks and needing less guidance. Although the number of interactions reduced, it is clear that student four consistently used the TL for NNS-NNS interaction in the Minecraft chat function. The task and game mechanic information student four had provided a significant influence on how the group tasks were able to proceed in a learner-centered manner throughout the gaming sessions.

Student four also benefited from ZPD. In the example below, Excerpt 20 (line three), student four used the word "bat" instead of the word "bad". In line four student one provided corrective feedback informing his interlocutor that he used the incorrect word. Due to this correction, student four was able to modify his output accordingly. This NNS-NNS interaction is further evidence for the game, tasks, and written chat combined to create a student-centered learning environment. The instant feedback and output modification may not have been possible in a traditional language learning environment in which one teacher attempts to give feedback in large classes to students individually.

### **Excerpt 20**

#### *Student Four ZPD Example*

- 
1. Student 4(M) oh rain..
  2. Student 1 (M) oh no...
  3. Student 4(M) our building is not bat! i want to visit such building!
  4. Student 1 (M) bat?
  5. Student 4 (M) bad...sorry



6. Student 1 (M) I think so, too!

---

#### 5.3.4 Student Five Chat Analysis

Student five's feedback data showed that she was a pre-intermediate English language learner and a non-gamer. During week one, student five's interactions were dominated by game mechanics questions and responses from other group members. After week one, analysis reveals that game mechanic questions became less prominent, and the student was able to participate in more task-based interactions within the chat function in Minecraft. The extract below, Excerpt 21, shows TL interaction involving student five in week one. In this section of the conversation, student five could not communicate with the other group members in the TL about the task but was able to interact in relation to game mechanics information. In the example below, student five could not, at first, find group members within the Minecraft world. However, through interactions with peers, student five discovered that she was able to use XYZ coordinates to find the position of other group members. The presence of these coordinates was never taught to the students during the orientation sessions but did appear on the screen. Through this interaction, they were able to locate each other.

### Excerpt 21:

#### *Student Five Game Chat Interaction*

- 
1. Student 5(F) No
  2. Student 5(F) Please tell me.
  3. Student 2(F) Oh sorry
  4. Student 2(F) Press the space button
  5. Student 2(F) Many times
  6. Student 2(F) What is you x number?
  7. Student 5(F) Thanks!
  8. Student 5(F) -132
  9. Student 3(M) -230
  10. Student 5(F) How about you ?
  11. Student 2(F) 718
  12. Student 2(F) I'm 500 now
  13. Student 5(F) -60 now.
  14. Student 2(F) Okey
  15. Student 5(F) I'm in 500.
  16. Student 2(F) 0 now but I can't see anything
  17. Student 5(F) What is your y number?
  18. Student 2(F) X 57 Y 100 Z -741
  19. Student 3(M) I see you
  20. Student 5(F) OK
  21. Student 2(F) I can see only island
  22. Student 2(F) And you?
  23. Student 5(F) X198 Y106 Z-22
  24. Student 2(F) OK..
- 

The data for student five also provided instances of ZPD. In the conversation below, Excerpt 22, line three, we can see that student two had an issue with the minimal pairs “grass” and “glass”. This is a very typical error for Japanese EFL learners and was quickly recognized by student five due to the context of the interaction. Student five provided two instances of corrective feedback on her utterance with a one-word clarification request in line four: repeating the mistaken word, “grass?”. Student two initially does not recognize the error and attempts to justify the need for “grass” in line five. In line six, student five, realizing her error correction has been ineffective, proceeds to give more information about the error through the use of politeness. Due to this extra information, student five could acknowledge her error, correct it, and signal understanding through the appropriate use of humor. Without student two's assistance, student five may have continued to make the same mistake both within the

Minecraft setting and outside of it. This is a further example of the low stress student-centered learning environment provided by Minecraft.

## **Excerpt 22**

### *Student Five ZPD Example*

- 
1. Student 2(F) What should we use for windows??
  2. Student 5(F) I don't know. I will look at our resources.
  3. Student 2(F) There is grass!!
  4. Student 5(F) Grass?
  5. Student 2(F) Yes. It is very good for window
  6. Student 5(F) Grass is green...
  7. Student 2(F) Glass... haha... Sorry its mistake!!
  8. Student 5(F) haha
  9. Student 5(F) Now I understand
- 

### **5.3.5 Student Six Chat Analysis**

As outlined in chapter three, student six was one of the male members of the group. He was classified as a beginner English language learner and a casual gamer. Although he did not have any Minecraft experience, he did indicate that he had learned English casually through games. As shown in Excerpt 23, student six's interactions are often brief and limited to a single word or concise, simple sentences. In chapter two, White and Yamanishi (2020) showed that Japanese tend to use shorter phrases when interacting with technology, while Peterson (2008) suggested that using short messages was an advantage of social interaction within games. Due to his self-reported English language level it should come as no surprise that his interactions within the chat of Minecraft were limited. Data show that his interactions did not change significantly during the gaming sessions. In excerpt 23 his longest utterance can be seen in lines two, "thank you", and ten "Me too".

### **Excerpt 23**

#### *Student Six Game Chat Interaction*

- 
1. Teacher To stop flying (shift+space)
  2. Student 4(M) great!
  3. Student 6 (M) thank you
  4. Student 4(M) thanks!!
  5. Student 1 (M) thanks a lot!
  6. Student 4(M) find each other
  7. Student 1 (M) OK
  8. Student 1 (M) i'm on the top of the white towers
  9. Student 4(M) OK!
  10. Student 6 (M) Me too
  11. Student 4(M) the tower is made by you?
  12. Student 1 (M) no ,
  13. Student 6 (M) Yes
  14. Student 4(M) OK
  15. Student 4(M) snow?
  16. Student 1 (M) maybe snow
- 

However, analysis of the conversations does show that student six was a participant in ZPD. As Excerpt 24 shows, the group members struggling to deal with nighttime in the Minecraft world. Student six made the initial request for “light” in line one, showing that he understood what was needed to continue the task but was unable to produce the correct vocabulary for it. Student six then repeats the use of “light” on the assumption that this is correct. Student one then wrongly confirms that light is indeed the correct word, after which, in line four, student six makes a request to the teacher for light “teacher please give light to us”. As the teacher was the researcher for this research and followed a participant-observer approach, he could, in line five, intervene in the conversation (NS-NNS) to provide the correct vocabulary in this case “torch”. Once the teacher provided the vocabulary, student six acknowledged the correction by repeating the word in line six. This NS-NNS interaction provides one example of the role a teacher can assume in a GBL classroom; assisting a learner to achieve more than they could by themselves.

### **Excerpt 24**

#### *Student six ZPD example*

- 
1. Student 6 (M) we need light
  2. Student 1 (M) We can make a light
  3. Student 4 (M) Ask teacher
  4. Student 6 (M) teacher please give light to us
  5. Teacher I have given you torches
  6. Student 6 (M) torches
  7. Student 4(M) light up!!
  8. Student 1 (M) cool!
- 

By analyzing learner data at the case study level, the above discussion has demonstrated the learning opportunities provided by the gaming environment. This focus on individuals has added another layer of understanding for further discussion in later chapters. It should be noted that the analysis is based on the understanding and perceptions of the researcher and that the researcher understands that other interpretations of the data could exist. The following section will analyze the group as a whole with a focus on discussion of gender differences during interaction.

#### **5.4 Group Chat Analysis**

As seen above, each case study examined in this research is unique. However, to further deepen the understanding of the data, group analysis was conducted to discuss group and gender differences. Table 25 shows the number of interactions that highlight some noticeable gender differences. In the first two weeks, there was one male participant, student four (M), with more interaction than the female participants. From weeks three to seven, the female participants, student two (F) and five (F), consistently account for the highest weekly interactions. In week three, student five (F) had significantly more interactions than all other participants. In week four, student two (F), five (F), and four (M) all have 15 interactions, while in weeks six and seven, student two (F) has more than all the male participants. From this data, we can see that from an interaction perspective females in the research became more dominant. As stated in chapter two, gender differences in gaming reflect the gender stereotypes and norms observed in Western societies (van Reimersdal, Jansz, Peters, van Noort, 2013). However, Minecraft is a game that seemingly sits between the genders, and

while the data above suggests the female students participated more than the male students overall, the critical point is that both genders were able to participate in NNS-NNS student-led learning through completing the tasks in groups.

**Table 25**

*Weekly Group Chat Interactions*

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
S1(M)	22	10	8	12	6	6	7
S2(F)	39	19	10	15	22	18	12
S3(M)	9	16	15	12	10	16	8
S4(M)	44	22	8	15	6	8	5
S5(F)	25	15	23	15	22	11	11
S6(M)	15	8	10	7	5	5	8

Analyzing the weekly chat transcripts, there were some possible reasons for the differences beyond game preference. In week one, for example, as highlighted in excerpt 21 (above), the female participants spent significant time refining their Minecraft game mechanic skills. Female participants asked questions about Minecraft's mechanics, such as how to fly, obtain materials, and place the materials they have received to complete the task. These interactions took place even after the two-week Minecraft orientation classes but did allow for NNS-NNS interaction. Only after game mechanics interactions were mastered did the female participants begin to engage in the Minecraft task-related interaction and focus on the TL through interaction with group members. What is encouraging from a language learning and GBL perspective is that the females in the group, rather than try to figure out game mechanics issues through trial and error, they actively requested assistance in the TL and frequently received it from a more knowledgeable peer. This student-led learning is more commonly seen in the GBL environment than the traditional classroom setting in Japan and provides some evidence of how the use of games in a classroom may be beneficial in creating a hybrid classroom.

Moreover, the game mechanic requests were almost always answered or acknowledged by other female participants. For example, (see Excerpt 25), student two (F) (line 1), is trying to remember how to make her character fly. Even though student five (F) is unsure, she acknowledges that a request has been made rather than staying silent. The male participants initially ignored the game mechanics information request made by student two (F). However, when no answer is forthcoming, student three (M) answers. The reason for this delay is unclear; however, it could be that the student was too preoccupied attempting to complete the task within the game and he did consider he had the time to answer the question. Alternatively, the student may have been shy or lacked confidence in his English language ability to answer the request.

### **Excerpt 25**

#### Female Group Members Interaction

- 
1. Student 2(F) How can I fry??
  2. Student 5(F) I don't know.
  3. Student 5(F) Sorry
- 

In Excerpt 26, student two (F) attempted to understand how to place blocks when she wanted to begin building a structure. The request for game mechanics information was again answered by student five (F), line one. However, it was unclear from the request posed by student two (F) if this utterance is related to what to build or how to build it. Student five (F) attempted to answer on her understanding that the request concerned a Minecraft task-based. Although student two (F) acknowledged student five's (F) answer, she quickly modified her output to clarify the request for game mechanics information and not task information. In this instance, the question is answered by student three (M). This example demonstrates that student three (M) is paying attention to the group chat and can understand the requests being made by the other students. His answering of the request may show that he initially lacked the confidence to answer the request at first but has gained some confidence, possibly from the

mistake made by student five (F). This example again shows how student-led learning within the chat is meaningful. By interacting together, student two (F) comprehended that her output was incorrect, modified the output, and was understood. What is clear is that a lack of gaming experience affected the TL produced by the students. However, this factor also allowed for other authentic student-led learning opportunities.

### **Excerpt 26**

Female group members interaction (2)

- 
1. Student 2(F) How to build?
  2. Student 5(F) It's a field.
  3. Student 5(F) Maybe a circle.
  4. Student 2(F) OK.
  5. Student 5(F) How do I put block?
  6. Student 3(M) Mouse click
- 

Transcripts show that the male participants, in contrast, spent little time discussing game mechanics. As shown in Excerpt 27, the conversation quickly progressed to completing the tasks assigned to them. The male participants were more concerned with interacting together to find the best environment to build and were confident with game mechanics. This was somewhat surprising given only one of the four students indicated that they had any gaming experience. Whether game mechanics interaction or task-related interaction, the end result in terms of language learning was that both male and female participants likely benefited from the meaningful nature of the interaction.

### **Excerpt 27**

*Male Group Members Chat Interaction*

- 
1. Student 4(M) where should we go?
  2. Student 6(M) Teacher didn't say
  3. Student 1(M) maybe, anywhere...?
  4. Student 4(M) lets explore!
  5. Student 6(M) yes
  6. Student 4(M) Would you follow me?
  7. Student 1(M) OK!
  8. Student 6(M) OK
  9. Student 4(M) lets climb!
  10. Student 4(M) im making stair
-



Transcript data indicates that the female participants consistently interacted more than the male participants. In week one, this was due to the number of game mechanics requests the female students posed. However, as the weeks continued, these requests decreased, and task-based interaction became more prevalent. In Excerpt 28, was observed that all of the interactions are Minecraft task-based. The participants share information about the task that needs to be completed and worked together as a team. In this research, female students may have benefited from more NNS-NNS interaction in Minecraft's chat more than male students in the same gaming session. However, it is difficult to draw any conclusion for the greater population based on this sample.

### **Excerpt 28**

#### Week Seven Group Chat Interaction Example One

---

1. Student 5(F) OK let's go.
  2. Student 2(F) What about inside?
  3. Student 3(M) I don't think we have time
  4. Student 5(F) Maybe we should make a path like the picture.
  5. Student 2(F) OK. In red?
  6. Student 5(F) Yes
  7. Student 2(F) Teacher can we have red brick please
  8. Teacher Here you are
  9. Student 2(F) Thank you
  10. Student 2(F) OK, I have started a path like this. When you finish please help me
  11. Student 5(F) I'm finished. How long is the path?
  12. Student 2(F) I think we can join the other group
  13. Student 5(F) OK
- 

In Excerpt 29, the male participants also undertake task-based interactions. This demonstrates that there is little difference in the interactions between the male and female participants by week seven except for quantity. Student two (F) and five (F) account for 45% interactions and the four male students 55%. Observations from the researcher highlight that the male participants were more focused on completing the task and intuitively went about finding tasks that needed to be completed without using the chat to interact. In comparison, student two (F) and student five (F) interacted more and decided on the labor division before attempting tasks.

## Excerpt 29

### *Week seven group chat interaction example two*

- 
1. Student 1(M) look at the picture
  2. Student 1(M) I think we are almost complete
  3. Student 6(M) I'm building a road
  4. Student 1(M) To the other buildigs?
  5. Student 6(M) Yes
  6. Student 6(M) Please help me
  7. Student 1(M) OK! Grey color?
  8. Student 6(M) Yes do you have grey blocks?
  9. Student 1(M) Not enough
  10. Student 4(M) Ask the teacher
  11. Student 6(M) Teacher can I have grey blocks for my road
  12. Teacher Here you are
  13. Student 6(M) Thanks
- 

### **5.5 Chat Analysis Summary**

The analysis outlined above has shown how students could interact while using the chat function in Minecraft to complete tasks. On an individual level, we may observe that all students could engage in ZPD. In some instances, the student received feedback, which allowed them to modify their language and produce more comprehensible output. This was true of both game mechanics and task-based language interactions. Often the feedback received only needed to be a single word for the recipient to modify their output correctly.

From the perspective of using GBL in the classroom setting, these findings provide some positive evidence. Firstly, the interactions and requests for modifications were almost exclusively student-led. This shows that in the GBL environment learners can control their own learning process and become less reliant on the teacher for feedback. Secondly, even low-level English language learners can produce coherent task-focused interactions, which may be due to the reduced anxiety of chatting within a game context. Finally, gender does appear to play a role in the type of interaction. Moreover, data show that interaction that is not task-focused can still be purposeful and provided language learning opportunities.

Another major finding is that all of the discourse of the gaming sessions was conducted in English. Within the traditional language learning classroom, the discourse used is often mixed, or even weighted more towards Japanese than English. Because the students need to use English the entire duration of the gaming lesson, they have significantly more opportunities to practice using the English. Given the low level of anxiety created by using GBL students, as we have seen in this chapter, are more inclined to provide English corrections, use humor, attempt to be leaders, interact with each other in the TL, and also interact with the teacher in the way that would be difficult to replicate in the traditional language learning classroom.

What is clear from the data analysis is that using Minecraft and chatting with other students in written English has provided opportunities for SLA to occur. As previously stated, the analysis above has been undertaken by a single researcher. The researcher acknowledges that the findings described in this chapter are not definitive and could be interpreted differently by others. However, the findings presented here indicate that the use of GBL language environments in the Japanese context is feasible and may provide the conditions in which language development can occur.

## **6.0 Vocabulary Analysis**

This chapter is the third and final presentation of the research results in this thesis. In chapter four, the data was analyzed for play using the POS. In chapter five, the chat data was analyzed to better understand the task-based interaction within game chat. The data in these chapters was analyzed from an individual case study perspective, the group, and gender. The following chapter will analyze the participants' interaction for each case study, as a group, and by gender. This chapter adds a further layer of understanding to the research, which assists in discussing the research questions in chapter eight.

This chapter will investigate the vocabulary learning of the students. As presented in chapter two, vocabulary acquisition is an incremental process (Schmitt, 2000) in which vocabulary can be learned intentionally or incidentally. The researcher anticipated that while chatting in written English to complete the tasks, students would participate in incidental vocabulary acquisition as the vocabulary students were exposed to and used occurs in a situated and meaningful way. The learners were not instructed but allowed to learn vocabulary and correct usage organically from the task-based interaction. It is essential at this point to reiterate that the analysis provided in this chapter is interpretive, and as such, the research acknowledges that other interpretations may exist.

### **6.1 K-Level Vocabulary**

This chapter will first analyze the data regarding the K-level vocabulary used by students. This analysis was undertaken using <https://www.lex tutor.ca/> a free digital tool. As outlined in chapter two, K level refers to Nation's (2006) 14 frequency lists based on the British Nation Corpus (BNC). This frequency list divides vocabulary into 1,000-word families based on frequency. The first 1,000-word families cover 81% of written texts, with an additional 1,000 vocabulary items adding 9% to this, and the next 1,000 adding 5%. This would mean that having a complete understanding of the first 3,000-word families in English

based on frequency would cover 95% of the BNC (Chien, 2019; Schmitt, Cobb, Horst, and Schmitt, 2017). The discourse needed for proficient language learners is between 95-98%. As outlined in chapter two, the K3 level contains 60% of the vocabulary present in Minecraft, with an additional 40% at the K4 -K14 level, and close to 10% of the vocabulary in Minecraft is not listed on the BNC (Chien, 2019). Meaning 10% of vocabulary in Minecraft has likely been created for that purpose.

### 6.1.1 Student One Vocabulary Analysis

In chapter three, the pre-gaming sessions survey information showed that student one was a pre-intermediate English-language learner and casual gamer. Analysis of the weekly chat data, Table 26, shows that in week one, student one used 16 words two or more times in the Minecraft chat, making up 57.58% of the words used. The most frequent words used were “OK” and “the”, while “go” and “maybe” were used three times each. Weeks two to seven followed a similar pattern with the most frequent word in the 50-minute gaming session being used between two to four times. When considering incidental learning of vocabulary, it was asserted in the literature that there is no agreed-upon number of times a learner must be exposed to a word for it to become knowledge (Waring & Takaki, 2003). Using Nation's (2006) idea of 5-16 exposures to vocabulary for acquisition to also include exposure to the same vocabulary from other students, the context in which the word was used (Feng, 2016), and the situated meaning (Gee, 2010), vocabulary may have increased at an incremental rate during the gaming sessions.

**Table 26**

*Student One Vocabulary Coverage*

Vocabulary ranking	Vocabulary frequency	Percentage of vocabulary used	Vocabulary
Week 1			
1	4	6.06%	ok
2	4	12.12%	the

3	3	16.67%	go
4	3	21.22%	maybe
5	2	24.25%	do
6	2	27.28%	let's
7	2	30.31%	me
8	2	33.34%	no
9	2	36.37%	snow
10	2	39.40%	thanks
11	2	42.43%	to
12	2	45.46%	too
13	2	48.49%	we
14	2	51.52%	where
15	2	54.55%	yes
16	2	57.58%	you

---

Week 2

1	3	5.36%	and
2	3	10.72%	is
3	3	16.08%	layer
4	3	21.44%	on
5	2	25.01%	about
6	2	28.58%	blocks
7	2	32.15%	how
8	2	35.72%	ok
9	2	39.29%	so
10	2	42.86%	thanks
11	2	46.43%	the
12	2	50.00%	we
13	2	53.57%	windows

---

Week 3

1	3	7.50%	I
2	3	15.00%	so
3	3	22.50%	we
4	2	27.50%	entrance
5	2	32.50%	make

---

Week 4

1	2	4.55%	I
2	2	9.10%	no
3	2	13.65%	thank
4	2	18.20%	this
5	2	22.75%	too
6	2	27.30%	yes

---

Week 5

1	2	5.13%	and
---	---	-------	-----

2	2	10.26%	next
3	2	15.39%	nice
4	2	20.52%	so
5	2	25.65%	thank
6	2	30.78%	we
7	2	35.91%	you
<hr/>			
Week 6			
1	4	8.89%	can
2	4	17.78%	I
3	3	24.45%	we
4	2	28.89%	change
5	2	33.33%	finish
6	2	37.77%	next
<hr/>			
Week 7			
1	2	8.70%	me
2	2	17.40%	the
3	2	26.10%	too

As seen in Table 27, in the first gaming session, student one used words exclusively from the K1 and K2 level of the BNC, with 97% of the vocabulary used coming from the K1 level and 3% from the K2 level. From gaming session two to seven, this pattern continued with a minimum of 85.7% of vocabulary coming from the K1 level each week. Student one used K3 level vocabulary in five of the seven weeks, although the usage was limited to a maximum of 5.4%. As stated above, being able to use the word families in the K1 level accounts for 81% of written texts in English and the K2 level another 9%. Thus, an credible assumption can be made that using tasks and written chat in Minecraft has given student one the opportunity to use up to 90% discourse needed to be a proficient English-language learner and increase his communicative competence through meaningful NNS-NNS context-based chat interaction.

**Table 27**

*Student One K-Level Vocabulary Usage*

K-Level	Word Families (%)	K – Level Vocabulary (%)	Cumulative total (%)
Week 1			

K-1 :	39 (95.1)	65 ( <u>97.0</u> )	97
K-2 :	2 (4.9)	2 ( <u>3.0</u> )	100
<hr/>			
Week 2			
K-1 :	32 (88.9)	48 ( <u>85.7</u> )	85.7
K-2 :	3 (8.3)	5 ( <u>8.9</u> )	94.6
K-3 :	1 (2.8)	3 ( <u>5.4</u> )	100
<hr/>			
Week 3			
K-1 :	29 (90.6)	38 ( <u>90.5</u> )	90.5
K-2 :	2 (6.2)	2 ( <u>4.8</u> )	95.3
K-3 :	1 (3.1)	2 ( <u>4.8</u> )	100
<hr/>			
Week 4			
K-1 :	30 (88.2)	40 ( <u>88.9</u> )	88.9
K-2 :	2 (5.9)	2 ( <u>4.4</u> )	93.3
K-3 :	2 (5.9)	2 ( <u>4.4</u> )	97.7
<hr/>			
Week 5			
K-1 :	28 (87.5)	35 ( <u>89.7</u> )	89.7
K-2 :	2 (6.2)	2 ( <u>5.1</u> )	94.8
K-3 :	2 (6.2)	2 ( <u>5.1</u> )	99.9
<hr/>			
Week 6			
K-1 :	29 (87.9)	40 ( <u>88.9</u> )	88.9
K-2 :	3 (9.1)	3 ( <u>6.7</u> )	95.6
K-3 :	1 (3.0)	1 ( <u>2.2</u> )	97.8
<hr/>			
Week 7			
K-1 :	19 (100.0)	23 ( <u>100.0</u> )	100

The vocabulary used by student one, Table 28, are Minecraft related and commonly used K1 and K2 vocabulary. For example, in week one, student one used the nouns “ground”, “top”, “tower”, “snow” (2), “finish”, “mountain”, and “blocks” within the chat. The pattern continued in weeks two to seven. Being able to practice using these words in low level anxiety environment of Minecraft's chat function and receiving immediate feedback on the usage may have provided opportunities to develop communicative competence.



**Table 28**

*Student One Parts of Speech Word List*

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Adjective	white	same, first, second, third			outside, nice (2), red, blue, gray, black, green	outside, big, difficult	other
Noun	ground, top, tower, snow (2), finish, mountain, blocks	block (2), line, space, window (2), side, layer, brick (2)	notice, brick, entrance (2), material	construction, teacher, building, entrance	teacher, brick, entrance	construction, place, ground, color, item	picture, building, color
Pronoun	me (2), we (2), you (2)	I	I (2), you, we (3)	I, me, you (2)	you (2), we (2)	I(3), we (2)	I, we, me (2)
Verb	see, covered, have	connect, finish (2), need	know, have, think, use, make (2)	continue, break, make	making, construct, have, continue	finish (2), continue, have, made, change, seek	look, think

In week one, student one used short, sometime one word, sentences and requests. However, in the week two, Excerpt 30, student one's sentence length has increased, which may be due to the social interaction within games (Peterson, 2008), and confidence gained through receiving a positive response to his question "we need windows on every side ..?" in line one. In line four student one uses a much longer sentence than his usual utterance. The data suggests that the game may have created a safe environment, removed fear, and possibly allowed him to use English at a level beyond his face-to-face classroom level.

### Excerpt 30

#### *Student One Increasing Confidence Example*

- 
1. Student 1 (M) we need windows on every side ..?
  2. Student 4 (M) it feel openly! nice but anyway like picture, curved line is made by glass
  3. Student 4 (M) windows
  4. Student 1 (M) so... how about the first layer is brick and second layer is windows and third layer is bricks... and so on
- 

### 6.1.2 Student Two Vocabulary Analysis

According to the pre-gaming session information in chapter three, we know that student two was an occasional gamer who had a pre-intermediate English level. Analysis of the weekly chat data in Table 29, shows that in week one, there were 20 words that student two used two or more times in the Minecraft chat, making up 61% of the words used that week. The most frequent words, “I”, and “you” were used nine times, “number” seven times, and “the” five times in the 50-minute gaming session. Weeks two to seven followed a similar pattern, with some words being used up to seven times a week. Based on Nation's (2006) exposure to vocabulary concept, the context (Feng, 2016,) and situated meaning (Gee, 2010), student two had opportunities for incidental learning and an incremental increase of vocabulary.

**Table 29**

#### *Student Two Vocabulary Coverage*

Vocabulary Ranking	Vocabulary Frequency	Percentage of vocabulary used	Vocabulary
Week 1			
1	9	8.33%	I
2	9	16.66%	you
3	7	23.14%	number
4	5	27.77%	the
5	3	30.55%	can
6	3	33.33%	fry
7	3	36.11%	now

8	3	38.89%	where
9	2	40.74%	and
10	2	42.59%	are
11	2	44.44%	but
12	2	46.29%	can't
13	2	48.14%	find
14	2	49.99%	I'm
15	2	51.84%	ok
16	2	53.69%	see
17	2	55.54%	thank
18	2	57.39%	to
19	2	59.24%	way
20	2	61.09%	x
<hr/>			
Week 2			
1	4	6.56%	how
2	4	13.12%	I
3	3	18.04%	do
4	3	22.96%	the
5	2	26.24%	is
6	2	29.52%	ok
7	2	32.80%	we
<hr/>			
Week 3			
1	6	13.04%	I
2	4	21.74%	ok
3	3	28.26%	is
4	3	34.78%	you
5	2	39.13%	help
6	2	43.48%	level
7	2	47.83%	the
8	2	52.18%	think
9	2	56.53%	track
10	2	60.88%	will
<hr/>			
Week 4			
1	4	8.33%	number
2	2	12.50%	I
3	2	16.67%	time
4	2	20.84%	will
<hr/>			
Week 5			
1	6	6.74%	number
2	4	11.23%	we
3	4	15.72%	window
4	4	20.21%	windows
5	3	23.58%	for
6	3	26.95%	gap
7	3	30.32%	glass
8	3	33.69%	many
9	2	35.94%	do
10	2	38.19%	haha...

11	2	40.44%	is
12	2	42.69%	mistake
13	2	44.94%	sorry
14	2	47.19%	thanks
15	2	49.44%	yes
<hr/>			
Week 6			
1	7	8.33%	I
2	5	14.28%	the
3	4	19.04%	ok
4	4	23.80%	we
5	4	28.56%	window
6	3	32.13%	need
7	3	35.70%	you
8	2	38.08%	can
9	2	40.46%	do
10	2	42.84%	glass
11	2	45.22%	have
12	2	47.60%	move
13	2	49.98%	number
14	2	52.36%	teacher
15	2	54.74%	to
16	2	57.12%	will
<hr/>			
Week 7			
1	3	5.45%	you
2	2	9.09%	can
3	2	12.73%	finish
4	2	16.37%	have
5	2	20.01%	I
6	2	23.65%	in
7	2	27.29%	ok
8	2	30.93%	please
9	2	34.57%	red
10	2	38.21%	thank
11	2	41.85%	this
12	2	45.49%	we

As seen in Table 30, in the first gaming-session, student two used words exclusively from the K1 (94.5%) and K2 (3.7%) level of the BNC, and 2.2% of the vocabulary used was unlisted. Over the seven gaming sessions, this pattern continued with a minimum of 87.3% of K1 vocabulary each week. Student two used K3 language in three of the seven gaming sessions at a maximum of 4.3% of vocabulary usage. Based on this, student two may have understood 90% of discourse needed to be a proficient English-language learner and increased

his communicative competence through meaningful NNS-NNS context-based chat interaction.

**Table 30**

*Student Two K-Level Vocabulary Usage*

K-Level	Word Families (%)	K – Level Vocabulary (%)	Cumulative total (%)
Week 1			
<b>K-1 :</b>	51 (96.2)	103 ( <u>94.5</u> )	94.5
<b>K-2 :</b>	2 (3.8)	4 ( <u>3.7</u> )	98.2
Week 2			
<b>K-1 :</b>	41 (87.2)	55 ( <u>87.3</u> )	87.3
<b>K-2 :</b>	5 (10.6)	5 ( <u>7.9</u> )	95.2
<b>K-3 :</b>	1 (2.1)	1 ( <u>1.6</u> )	96.8
Week 3			
<b>K-1 :</b>	25 (96.2)	45 ( <u>97.8</u> )	97.8
<b>K-2 :</b>	1 (3.8)	1 ( <u>2.2</u> )	100
Week 4			
<b>K-1 :</b>	39 (92.9)	45 ( <u>93.8</u> )	93.8
<b>K-2 :</b>	1 (2.4)	1 ( <u>2.1</u> )	95.9
<b>K-3 :</b>	2 (4.8)	2 ( <u>4.2</u> )	100
Week 5			
<b>K-1 :</b>	48 (96.0)	84 ( <u>91.3</u> )	91.3
<b>K-2 :</b>	1 (2.0)	2 ( <u>2.2</u> )	93.5
<b>K-3 :</b>	1 (2.0)	3 ( <u>3.3</u> )	96.8
Week 6			
<b>K-1 :</b>	49 (98.0)	86 ( <u>98.9</u> )	98.9
<b>K-3 :</b>	1 (2.0)	1 ( <u>1.1</u> )	100
Week 7			
<b>K-1 :</b>	38 (92.7)	52 ( <u>94.5</u> )	94.5
<b>K-2 :</b>	3 (7.3)	3 ( <u>5.5</u> )	100

The vocabulary used by student two, Table 31, are Minecraft related and commonly used K1 and K2 vocabulary. For example, in week one, student two used the nouns “forest”, “game”, “island”, “space button”, and “X number”. “Forest”, “game”, “island”, and “space button” are common K1 and K2 words that are also TL within Minecraft. This pattern continued in the gaming sessions that followed. Being able to gain meaningful practice of K1 and K2 words through NNS-NNS interaction in a low-anxiety environment may have provided opportunities for this learner to improve her communicative competence.

**Table 31**

*Student Two Parts of Speech Word List*

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Adjective		gray, green, yellow	wrong	gray, difficult, long		last, other	red (2), other, hard
Noun	forest, game, space button, X number , island	space, task, material, seats, blocks, sandstone , pattern, brick, track	track, Level (2), floor, building , stairs, way	task, today, color, material, construction, time (2), level	window s (9), grass, glass (3), block (2), gap, level	window (3), level, glass (2), door, construction	finish, building , brick, path, inside
Pronoun	I (10), I’m (2), me, we, you (8)	we, you, I (4)	I (6), mine, you (3)	I	I, my, you, we (3)	I (8), you (4), we (4), our	I (2), you (3)
Verb	fly (3), build, press,	get, build, put, use, finishing, play, save	make, help, think (2), put, help	look, want, use, take, try, think, need	use, look, making	remember, need (2), move (2), give, have (2), ask, hope, finish	have (2), started, finish, help, think, join

The chat also allowed student two to be exposed to new vocabulary. “X number”, for example, is an uncommon word for English-language learners unless it is needed for a

specific situation. Student two most likely learned “X number” through in-game chat interaction. On two occasions in week one, student two used “X number” in an appropriate context. When asking another student who was lost her location what’s your “x number”, and then providing her location to another student, “X 57 Y 100 Z -741”. Being able to practice using the vocabulary and receiving feedback on her usage from other NNS may have helped her learn the vocabulary. This example demonstrates how through GBL, students may be able to become more autonomous language learners and increase their communication competence. However, it must be acknowledged that the vocabulary learned in this example is highly specific to Minecraft.

### 6.1.3 Student Three Vocabulary Analysis

Based on student three's pre-gaming session information, he was classified as a non-gamer and a pre-intermediate English-language learner. Analysis of the weekly chat data, Table 32, showed that in week one, there were four words used two or more times in the Minecraft chat, making up 50% of the total words used. The most frequently used words were “I”, which was used four times, and the words “am”, “near”, and “water”, which were all used two times. Weeks two to seven followed a similar pattern with the most frequent word used up to six times. Using Nation's (2006) vocabulary exposure concept and including the vocabulary he was exposed to in the chat from other students, we can speculate that incidental vocabulary learning occurred.

**Table 32**

*Student Three Vocabulary Coverage*

Vocabulary Ranking	Vocabulary Frequency	Percentage of vocabulary used	Vocabulary
Week 1			
1	4	20.00%	I
2	2	30.00%	am

3	2	40.00%	near
4	2	50.00%	water
<hr/>			
Week 2			
1	3	6.52%	we
2	2	10.87%	brick
3	2	15.22%	how
<hr/>			
Week 3			
1	4	4.71%	I
2	4	9.42%	need
3	3	12.95%	ok
4	3	16.48%	the
5	3	20.01%	we
6	3	23.54%	you
7	2	25.89%	a
8	2	28.24%	finished
9	2	30.59%	how
10	2	32.94%	is
11	2	35.29%	level
12	2	37.64%	many
13	2	39.99%	number
14	2	42.34%	thank
15	2	44.69%	to
<hr/>			
Week 4			
1	6	6.45%	is
2	5	11.83%	the
3	4	16.13%	I
4	4	20.43%	number
5	4	24.73%	think
6	3	27.96%	building
7	3	31.19%	it
8	3	34.42%	many
9	2	36.57%	a
10	2	38.72%	big
11	2	40.87%	but
12	2	43.02%	do
13	2	45.17%	enough
14	2	47.32%	has
15	2	49.47%	how
16	2	51.62%	to
17	2	53.77%	too
18	2	55.92%	we
<hr/>			
Week 5			
1	6	9.84%	the



2	4	16.40%	can
3	3	21.32%	door
4	3	26.24%	I
5	3	31.16%	in
6	3	36.08%	ok
7	2	39.36%	have
8	2	42.64%	is
9	2	45.92%	middle
10	2	49.20%	picture
11	2	52.48%	we
12	2	55.76%	you
<hr/>			
Week 6			
1	6	7.14%	the
2	4	11.90%	I
3	4	16.66%	is
4	3	20.23%	door
5	3	23.80%	have
6	3	27.37%	maybe
7	3	30.94%	week
8	2	33.32%	give
9	2	35.70%	it
10	2	38.08%	next
11	2	40.46%	number
12	2	42.84%	ok
13	2	45.22%	right
14	2	47.60%	still
15	2	49.98%	thanks
16	2	52.36%	we
17	2	54.74%	will
<hr/>			
Week 7			
1	3	7.69%	I
2	2	12.82%	good
3	2	17.95%	think
4	2	23.08%	we

As seen in Table 33, in week one, student three used K1 level vocabulary exclusively. This may have been due to a lack of communicative competence in using English as a means of communication. Over the seven gaming sessions student three's vocabulary usage fluctuated between the K1 to K4 level, with a minimum K1 usage of 85.7%. For student three using Minecraft may have been helpful in increasing his K1 and K2 vocabulary. Minecraft

could provide a space in which student three gains much needed practice, through discourse only in English, in a low anxiety environment. It was noted that student three had attended an English-language school in the past and used English in his part-time job. This may have improved his spoken English communicative competence due to the fact that his language school would focus on speaking, as would his job as a waiter. His written communicative competence, in contrast, may have had little opportunity to increase. Using games to practice his written English could assist in bridging the gap between his speaking and written competence.

**Table 33**

*Student Three K-Level Vocabulary Usage*

K- Level	Word Families (%)	K – Level Vocabulary (%)	Cumulative total (%)
Week 1			
<b>K-1 :</b>	15 (100.0)	21 ( <u>100.0</u> )	100
Week 2			
<b>K-1 :</b>	36 (90.0)	42 ( <u>85.7</u> )	85.7
<b>K-2 :</b>	3 (7.5)	4 ( <u>8.2</u> )	93.9
<b>K-4 :</b>	1 (2.5)	1 ( <u>2.0</u> )	95.9
Week 3			
<b>K-1 :</b>	48 (90.6)	78 ( <u>91.8</u> )	91.8
<b>K-2 :</b>	2 (3.8)	2 ( <u>2.4</u> )	94.2
<b>K-3 :</b>	1 (1.9)	1 ( <u>1.2</u> )	95.4
<b>K-4 :</b>	1 (1.9)	1 ( <u>1.2</u> )	96.6
Week 4			
<b>K-1 :</b>	53 (100.0)	93 ( <u>100.0</u> )	100
Week 5			
<b>K-1 :</b>	37 (100.0)	63 ( <u>100.0</u> )	100
Week 6			
	84 words		
<b>K-1 :</b>	50 (98.0)	84 ( <u>97.7</u> )	97.7
<b>K-4 :</b>	1 (2.0)	1 ( <u>1.2</u> )	98.9
Week 7			
	39 words		

K-1 :	32 (97.0)	38 (95.0)	95
K-2 :	1 (3.0)	1 (2.5)	97.5

**Table 34:**

*Student Parts of Speech*

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Adjective		green, big, more		big (2), many (3), little, easy(2), square, round, enough(2)	more	same, right, enough	last, red, good (2)
Noun	water (2)	color (2), grass, mouse, brick (2), track	Teacher(2), today, ground, picture(2), seating area, track, stairs, stadium, floor, block, level(2)	building (4), floors, picture, group, window, today, outside	levels, door (3), picture (2), teacher, window, glass, room, middle	door (3), window (2), glass, click, week (3)	today, teacher, brick, job, field, building
Pronoun		I, we (3)	I (4), we (2), you (3)	I (4), you, we (2)	I(4), you (2), we (2)	I (4), me, you, we	I (3), you, we, our
Verb	fly, see	use, click, making, have, finish	need (2), finish (3), making, mean, see, construct	think(4), should, look, fly, build, have(3), making	put, finished, help, make, finish	think, add, give (2), have (2)	must, finish, help, think

The vocabulary used by student three shown in Table 34 are Minecraft related vocabulary and commonly used K1 and K2 vocabulary. For example, in week one, student three used the noun “*water*” on two occasions, and the verbs “*fly*” and “*see*”. The pattern continued in weeks two to seven. Practicing words which are the essential building blocks in English within the game chat and receiving immediate feedback on the correct output of these words may have assisted student three increase his communicative competence.

An example of this phenomenon can be seen in the week three (Excerpt 31.) In this interaction, student three took a leadership role in the group and relayed important task information to the other students. In turn one he states in line two, “Teacher said, today we need to finish making the ground.” In turn two, line eight, he outlines what needs to be finished to complete the task, “OK. Look at the picture. We need to make a seating area.” This demonstrates his increased communicative competence from previous weeks. Prior to this, student three had not actively attempted to lead the group, and many of his utterances were between one to three words responses to other students. Although it is difficult to say conclusively that his communicative competence did improve, it does seem possible that using the in-game chat to practice and gain a solid understanding of K1 and K2 vocabulary through NNS-NNS interaction in a low anxiety environment provided some assistance in language development.

### **Excerpt 31**

#### *Student Three Communicative Competence*

- 
1. Student 3(M) Hello
  2. Student 3(M) Teacher said today we need to finish making the ground
  3. Student 2(F) OK
  4. Student 5(F) OK
  5. Student 5(F) Look the flowers.
  6. Student 2(F) Pretty.
  7. Student 2(F) I will make the track
  8. Student 3(M) OK. Look at the picture. We need to make seating area.
  9. Student 5(F) Gray color. What material should we use?
  10. Student 3(M) Same as track or different?
  11. Student 5(F) Maybe different is better. I will check.
  12. Student 5(F) There are gray stairs.
- 

#### **6.1.4 Student Four Vocabulary Analysis**

The pre-gaming session survey data showed that student four was an advanced beginner English-language learner and a non-gamer. Analysis of the weekly chat data (Table 35) shows that in week one student four used 26 words two or more times in the chat, totaling 51.75% of the words used. The most frequent word in the 50-minute gaming session being

used up to eight times. Regarding incidental vocabulary learning, student four had significant opportunities over the seven gaming sessions by using vocabulary with situated meaning (Gee, 2010) within Minecraft. He also provided opportunities for the others in the group to increase vocabulary through his task-focused interactions.

**Table 35**

*Student Four Vocabulary Coverage*

Vocabulary Ranking	Vocabulary Frequency	Percentage of vocabulary used	Vocabulary
Week 1			
1	8	5.52%	is
2	6	9.66%	you
3	5	13.11%	ok
4	4	15.87%	building
5	4	18.63%	so
6	3	20.70%	flying
7	3	22.77%	I
8	3	24.84%	lets
9	3	26.91%	me
10	3	28.98%	plain
11	3	31.05%	the
12	2	32.43%	are
13	2	33.81%	by
14	2	35.19%	difficult
15	2	36.57%	follow
16	2	37.95%	gather
17	2	39.33%	go
18	2	40.71%	great
19	2	42.09%	here
20	2	43.47%	im
21	2	44.85%	in
22	2	46.23%	made
23	2	47.61%	make
24	2	48.99%	maybe
25	2	50.37%	tower
26	2	51.75%	we
Week 2			
1	5	5.32%	is

2	5	10.64%	make
3	2	12.77%	and
4	2	14.90%	building
5	2	17.03%	but
6	2	19.16%	it
7	2	21.29%	like
8	2	23.42%	line
9	2	25.55%	not
10	2	27.68%	picture
11	2	29.81%	wall
12	2	31.94%	we
13	2	34.07%	windows
14	2	36.20%	you
<hr/>			
Week 3			
1	2	6.67%	cannot
2	2	13.34%	it
3	2	20.01%	teacher
<hr/>			
Week 4			
1	3	4.62%	I
2	3	9.24%	of
3	3	13.86%	you
4	2	16.94%	bricks
5	2	20.02%	building
6	2	23.10%	Ill
7	2	26.18%	is
8	2	29.26%	please
9	2	32.34%	the
<hr/>			
Week 5			
1	4	15.38%	the
2	2	23.07%	make
3	2	30.76%	we
<hr/>			
Week 6			
1	2	8.00%	and
2	2	16.00%	ok
<hr/>			
Week 7			
1	2	10.53%	we

As seen in Table 36, student four used words from the K1 to K7 level in week one with 95.3% of his language coming from a K1 and K2 level. Week one proved to contain the greatest range of vocabulary in terms of K levels. After week one, vocabulary from K1 to K4 was common in most weeks, with the exception of week seven in which K1 language was

used exclusively. Based on this, the assumption could be made that student four could understand at least 90% of English texts and had the opportunity to understand more through the use of higher-level vocabulary in the meaningful context provided. The reason for the reduction in K levels observed in weeks six and seven is unclear.

**Table 36**

*Student Four K-Level Vocabulary Usage*

K-Level	Word Families (%)	K – Level Vocabulary (%)	Cumulative total (%)
<b>Week 1</b>			
K-1 :	69 (83.1)	130 ( <u>87.2</u> )	87.2
K-2 :	8 (9.6)	12 ( <u>8.1</u> )	95.3
K-3 :	3 (3.6)	3 ( <u>2.0</u> )	97.3
K-4 :	1 (1.2)	1 ( <u>0.7</u> )	98
K-5 :	1 (1.2)	1 ( <u>0.7</u> )	98.7
K-7 :	1 (1.2)	1 ( <u>0.7</u> )	99.4
<b>Week 2</b>			
K-1 :	57 (86.4)	81 ( <u>87.1</u> )	87.1
K-2 :	6 (9.1)	6 ( <u>6.5</u> )	93.6
K-3 :	2 (3.0)	2 ( <u>2.2</u> )	95.8
K-4 :	1 (1.5)	1 ( <u>1.1</u> )	96.9
<b>Week 3</b>			
K-1 :	24 (92.3)	28 ( <u>90.3</u> )	90.3
K-2 :	2 (7.7)	2 ( <u>6.5</u> )	96.8
<b>Week 4</b>			
K-1 :	41 (85.4)	59 ( <u>85.5</u> )	85.5
K-2 :	7 (14.6)	8 ( <u>11.6</u> )	97.1
<b>Week 5</b>			
K-1 :	18 (81.8)	23 ( <u>85.2</u> )	85.2
K-2 :	3 (13.6)	3 ( <u>11.1</u> )	96.3
K-3 :	1 (4.5)	1 ( <u>3.7</u> )	100
<b>Week 6</b>			
K-1 :	18 (94.7)	22 ( <u>84.6</u> )	84.6

K-2 :	1 (5.3)	1 (3.8)	88.4
<hr/>			
Week 7			
K-1 :	17 (100.0)	19 (100.0)	100

The vocabulary used by student four (Table 37) are both Minecraft vocabulary and words commonly used in English. For example, in week one, student four used the nouns “stair”, “field”, “landmark”, “tower”, “snow”, “world”, “building” (3), “space”, “material”, “pickaxe”, “blocks”, “task”, “round”, and “triangle”. Along with nouns from the K1 and K2 levels, student four also used K4 “triangle”, K5 “landmark”, and K7 “pickaxe”. While the K1 and K2, and K4 nouns are regularly used in English and are appropriate for student four's English-language learner ability, the K5 and K7 nouns indicate that within the context of the in-game chat of Minecraft, he is willing to attempt to use a higher level of vocabulary. This could be due to the task-based nature of the environment, which as noted previously appeared to create a low-anxiety level.

**Table 37**

*Student Four Parts of Speech Word List*

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	
Adjective	dark, slow, difficult, great (2), wide, unlimited, plain (2)	large, precise, difficult, good, high, bad, beautiful, nice, curved, careful		good, much, bad		outside, nice (2), red, blue, gray, black, green	impossible, wide, difficult	



Noun	stair, field, landmark, tower, snow, world, building (3), space, material, pic ax (pixel), blocks, task, round, triangle	building (2), triangle, point, line (2), wall (2), pole, brick, stone, picture (2), materials, window (2), glass	glass, teacher (2), brick, light	height, line, ceiling, materials, glass, brick (2), rain, building (2)	teacher, brick, entrance	terrace, table, chair	day, today, teacher
Pronoun	I (4), me (2), you (4), we (2), us, our	I, you (2), we (2)	we, us	I (2), me, you (3), our	you (2), we (2)	I	I, we (2)
Verb	should, explore, follow (2), make (5), found, create, lost, flying (4), building, gather, gave, hold, climb	make (6), decide, look, connect, feel, agree	set, remove, put, gave, ask	continue, decided, think, give, use, want, visit	making, construct, have, continue	making, represent	have, finish (2), think, look

Excerpt 32 shows an example of student four's confidence level when engaging in task discussions in Minecraft. Here we can observe that student four dominates the chat interactions and took on a leadership role. This learner in line 19 uses the sentence “by pickaxe teacher gave us,” which, although grammatically incorrect, demonstrates how he has tried to use Minecraft TL appropriately in the correct context, which could likely lead to an increase in the vocabulary he understands and can use effectively.

## Excerpt 32

### *Student Four Communicative Competence*

---

1. Student 1 (M) where are you??
  2. Student 4(M) so, maybe you are sooooo far from me
  3. Student 4(M) im lflying
  4. Student 1 (M) can you see the mountain covered with snow?
  5. Student 4(M) you!
  6. Student 1 (M) yeah!
  7. Student 4(M) great so go to plain building
  8. Student 4(M) Please follow me
  9. Student 1 (M) OK! let's go
  10. Student 4(M) flying
  11. Student 4(M) up is space key long
  12. Student 1 (M) thanks!
  13. Student 4(M) here is plain so down
  14. Student 4(M) todays task is building
  15. Student 6 (M) May difficult
  16. Student 1 (M) yes, so where do we have tn put blocks first?
  17. Student 4(M) ummmm..
  18. Student 4(M) anyway gather the material
  19. Student 4(M) by pickaxe teacher gave us
  20. Student 6 (M) Thank you
- 

### **6.1.5 Student Five Vocabulary Analysis**

Student five's responses to the pre-study questionnaire showed that she is a pre-intermediate English-language learner and a non-gamer. Analysis of the chat data (Table 38) showed that in week one, there were 11 words that she used two or more times in Minecraft chat, which accounted for 42.5% of all vocabulary used. The most frequent word used was “I”, which was used nine times, followed by “number”, at five times, and “you” four times. Weeks two to seven followed a similar pattern with the most frequent words the gaming sessions used up to five times. When considering incidental learning of vocabulary and Nation's (2006) concept of 5-16 exposures, we can conclude that student five may have learned vocabulary from the chat function based on the vocabulary she used and was exposed to during the in-game chat.

**Table 38**

## Student Five Vocabulary Coverage

Vocabulary Ranking	Vocabulary Frequency	Percentage of vocabulary used	Vocabulary
Week 1			
1	9	11.25%	I
2	5	17.50%	number
3	4	22.50%	you
4	2	25.00%	am
5	2	27.50%	don't
6	2	30.00%	find
7	2	32.50%	in
8	2	35.00%	know
9	2	37.50%	maybe
10	2	40.00%	me
11	2	42.50%	sorry
Week 2			
1	3	6.98%	the
2	2	11.63%	a
3	2	16.28%	field
4	2	20.93%	I
5	2	25.58%	maybe
6	2	30.23%	to
7	2	34.88%	very
Week 3			
1	5	4.76%	the
2	4	8.57%	I
3	3	11.43%	do
4	3	14.29%	floor
5	3	17.15%	gray
6	3	20.01%	number
7	3	22.87%	ok
8	3	25.73%	stairs
9	3	28.59%	teacher
10	3	31.45%	thanks
11	2	33.35%	are
12	2	35.25%	as
13	2	37.15%	how
14	2	39.05%	is
15	2	40.95%	level
16	2	42.85%	look

17	2	44.75%	need
18	2	46.65%	please
19	2	48.55%	put
20	2	50.45%	second
21	2	52.35%	us
22	2	54.25%	we
23	2	56.15%	will
24	2	58.05%	you
<hr/>			
Week 4			
1	3	5.36%	number
2	3	10.72%	we
3	2	14.29%	are
4	2	17.86%	do
5	2	21.43%	haha
6	2	25.00%	I
7	2	28.57%	level
8	2	32.14%	ok
<hr/>			
Week 5			
1	4	5.19%	I
2	4	10.38%	is
3	4	15.57%	number
4	2	18.17%	big
5	2	20.77%	building
6	2	23.37%	grass
7	2	25.97%	I'll
8	2	28.57%	level
9	2	31.17%	the
10	2	33.77%	this
11	2	36.37%	we
12	2	38.97%	yes
<hr/>			
Week 6			
1	5	10.00%	gap
2	5	20.00%	window
3	3	26.00%	I
4	3	32.00%	think
5	2	36.00%	don't
6	2	40.00%	door
7	2	44.00%	it
8	2	48.00%	looks
9	2	52.00%	so
<hr/>			
Week 7			
1	3	8.33%	ok
2	2	13.89%	path
3	2	19.45%	the

4	2	25.01%	you
---	---	--------	-----

As seen in Table 39, in the first gaming session, student five used words exclusively from the K1 and K2 level of the BNC, with 95.1% of the vocabulary used coming from the K1 level and a further 1.2% from the K2 level. Over the seven gaming sessions, student five mainly used K1 and K2 vocabulary, except during weeks five and six where a single K3 level word was used. Using K1 and K2 level vocabulary while completing the tasks may have allowed her to practice this vocabulary in the in-game chat through NNS-NNS interaction to increase her communicative competence.

**Table 39**

*Student Five K-Level Vocabulary Usage*

K-Level	Word Families (%)	K – Level Vocabulary (%)	Cumulative total (%)
Week 1			
K-1 :	44 (97.8)	78 ( <u>95.1</u> )	95.1
K-2 :	1 (2.2)	1 ( <u>1.2</u> )	96.3
Week 2			
K-1 :	36 (97.3)	44 ( <u>97.8</u> )	97.8
K-2 :	1 (2.7)	1 ( <u>2.2</u> )	100
Week 3			
K-1 :	59 (93.7)	97 ( <u>92.4</u> )	92.4
K-2 :	4 (6.3)	7 ( <u>6.7</u> )	99.1
Week 4			
K-1 :	41 (97.6)	53 ( <u>93.0</u> )	93
K-2 :	1 (2.4)	1 ( <u>1.8</u> )	94.8
Week 5			
K-1 :	48 (96.0)	76 ( <u>93.8</u> )	93.8
K-2 :	1 (2.0)	1 ( <u>1.2</u> )	95
K-3 :	1 (2.0)	1 ( <u>1.2</u> )	96.2
Week 6			
K-1 :	32 (97.0)	46 ( <u>88.5</u> )	88.5

K-3 :	1 (3.0)	5 (9.6)	98.1
Week 7			
K-1 :	28 (93.3)	34 (91.9)	91.9
K-2 :	2 (6.7)	3 (8.1)	100

By examining some of the vocabulary used by student five (Table 40) we can see that it is Minecraft related and also contains words commonly used in English. For example, in week one, this learner used the nouns “shirt”, “PC”, and “Y number”. “Y number” is a word that most students, including student five, have probably not come across before the gaming sessions. Student five most likely learned “Y number” through context and NNS-NNS interaction.

**Table 40**

*Student Five Parts of Speech Word List*

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Adjective	purple, higher	red	gray (3), second (2), third	lucky, interesting, gray, long	big (2), green (1), small, good	good, better, right	more, enough
Noun	shirt, PC, place, Y Number	ground, track, field (2), circle, flowers	flowers, color, material, stairs (3), track, picture, floor (2), level (2), block, stand, help	brick, track, level (2), window	building (2), windows, resources, grass (2), blocks, level	window (5), gap (5), door (2)	path (2), picture, minutes
Pronoun	I (10), my, me (2), you (5), your	I (2), we, you		I, we, you	I (5), my, we (2), our	I (3), you, we	I (2), you (2)

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Verb	put, looking, build, find (2), stopped, working, can, can't, restarted, flying	ask, look, put, need, finish	look (2), should, check, give, gave, put (2), make, finish, need	think, make, agree, have	need, finish (2), put, understand	look, move, finish	should, make, think
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In Excerpt 33, it can be observed that student five requests the “Y number” of the other students in the group because she cannot locate them. She may have been prompted to use “Y number” as student two had just requested her “X number” for the same reason. This exchange between student two and student five may have presented student five with an opportunity to learn the meaning of the new vocabulary. This demonstrates how the students could create a student-centered learning environment that may have elicited vocabulary acquisition.

### Excerpt 33

#### *Student Five Y Number*

- 
- |                 |                        |
|-----------------|------------------------|
| 1. Student 5(F) | What is your y number? |
| 2. Student 2(F) | X 57 Y 100 Z -741      |
| 3. Student 3(M) | I see you              |
| 4. Student 5(F) | OK                     |
| 5. Student 2(F) | I can see only island  |
| 6. Student 2(F) | And you?               |
| 7. Student 5(F) | X198 Y106 Z-22         |
| 8. Student 2(F) | OK..                   |
- 

### 6. 1. 6 Student Six Vocabulary Analysis

In chapter three, the pre-gaming session survey information showed that student six was a beginner English-language learner and a casual gamer. Analysis of weekly chat data in Table 41 shows that in week one, there were six words used two or more times, making up 40.02% of the total vocabulary used. This suggests that nearly 60% of the vocabulary used by student six was only used on one occasion. The words used two times by student six in the 50-minute gaming session included “OK”, “thank”, “we”, “what”, “yes”, and “you”. Student

six followed a similar pattern in the gaming sessions and only used the same word three times in weeks three and six, and four times in weeks four and seven. This frequency level is unsurprising given that student six was classified as a beginner English-language learner. When considering incidental learning, it would be difficult for student six to reach the threshold set by Nation (2006) by himself. However, it is still possible that the input from other group members within the chat and use of vocabulary situated in the tasks could have helped him engage in incremental vocabulary acquisition.

**Table 41**

*Student Six Vocabulary Coverage*

Vocabulary Ranking	Vocabulary Frequency	Percentage of vocabulary used	Vocabulary
Week 1			
1	2	6.67%	ok
2	2	13.34%	thank
3	2	20.01%	we
4	2	26.68%	what
5	2	33.35%	yes
6	2	40.02%	you
Week 2			
1	2	9.52%	how
Week 3			
1	3	10.00%	us
2	2	16.67%	light
3	2	23.34%	ok
4	2	30.01%	teacher
Week 4			
1	4	19.05%	ok
2	2	28.57%	the
Week 5			
1	1	4.55%	and
2	1	9.10%	black
Week 6			
1	3	12.50%	I
2	2	20.83%	is
3	2	29.16%	so



Week 7			
1	4	13.33%	yes
2	2	20.00%	blocks
3	2	26.67%	gray
4	2	33.34%	have
5	2	40.01%	I
6	2	46.68%	road

As seen in Table 42, in the first gaming session, student six used words exclusively from the K1 and K2 level of the BNC, with 93.5% of the vocabulary used coming from K1 and 6.5% from K2. This pattern of using language within the K1 and K2 levels remained consistent throughout the seven gaming sessions except in weeks two and three. In week two, student six used the K4 level vocabulary item “triangle”, and in week three, the K5 level vocabulary item “torches”. Based on this, an assumption could be made that student six is confident with up to 81% of English texts, has some ability to understand a further 9% of English texts, but would struggle beyond that. For student six, the ability to use the chat function to complete the tasks is most likely a means to practice the basic building blocks of English that he may not be able to do in a formal classroom due to a teacher-centered method of instruction.

**Table 42**

*Student Six K-Level Vocabulary Usage*

K-Level	Word Families (%)	K – Level Vocabulary (%)	Cumulative total (%)
<b>Week 1</b>			
<b>K-1 :</b>	22 (91.7)	29 ( <u>93.5</u> )	93.5
<b>K-2 :</b>	2 (8.3)	2 ( <u>6.5</u> )	100
<b>Week 2</b>			
<b>K-1 :</b>	18 (90.0)	19 ( <u>90.5</u> )	90.5
<b>K-2 :</b>	1 (5.0)	1 ( <u>4.8</u> )	95.3
<b>K-4 :</b>	1 (5.0)	1 ( <u>4.8</u> )	100
<b>Week 3</b>			
<b>K-1 :</b>	18 (90.0)	26 ( <u>86.7</u> )	86.7

<b>K-2 :</b>	1 (5.0)	2 ( <u>6.7</u> )	93.4
<b>K-5 :</b>	1 (5.0)	1 ( <u>3.3</u> )	96.7
Week 4			
<b>K-1 :</b>	15 (88.2)	19 ( <u>90.5</u> )	90.5
<b>K-2 :</b>	2 (11.8)	2 ( <u>9.5</u> )	100
Week 5			
<b>K-1 :</b>	20 (90.9)	20 ( <u>90.9</u> )	90.9
<b>K-2 :</b>	2 (9.1)	2 ( <u>9.1</u> )	100
Week 6			
<b>K-1 :</b>	20 (100.0)	24 ( <u>100.0</u> )	100
Week 7			
<b>K-1 :</b>	19 (95.0)	29 ( <u>93.5</u> )	93.5
<b>K-2 :</b>	1 (5.0)	2 ( <u>6.5</u> )	100

The vocabulary items used by student six (Table 43) are both Minecraft related vocabulary as well as words commonly used in English. For example, in week three, student six used the nouns “teacher”, “brick”, “light”, and “torches” from the K1, K2, and K5 levels to successfully communicate with other team members and complete the tasks. As a beginner English-language learner, being able to successfully use this vocabulary within the context of Minecraft could assist in building written communicative competence, even if this competence is limited to the K1 level.

**Table 43**

*Student Six Parts of Speech Word List*

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Adjective	light, high, unlimited, difficult, flat	big	careful, many, dark,	same	different, red, blue, green	big	
Noun		triangle, gate, class	teacher (2), brick (2), light (2), torches	today, ceiling, brick color, picture	roof, color, brick	tree, size	road (2), blocks (2), teacher
Pronoun	you (2), we (2), me	I, we	I, he, us (3), we	we	we	I (4)	I (3), my, you, me

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Verb	create, need, finish	agree, fly, make, finish	give (2), need	Need, finish	finish, need	have, set, expect, grow, cut, finish	building, help, have (2), think
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An example of this behavior can be seen in Excerpt 34. This data comes from the group conversation in week three and shows for the first time, student six leading a conversation as well as participating in it. In earlier weeks, it was observed that student six would pose one-word questions or give one-word statements and often did not follow up on the conversation. However, over the first two weeks, it appeared that student six has developed some level of communicative competence. This data showed that he engaged in English written chat while completing the tasks with his group and appeared to be more willing to lead and follow up on a conversation. In lines one and two of Excerpt 34, student six recognized the need for light inside the building. Due to the game being able to reduce the barrier of communication between the authority figure teacher and student, student six gained enough confidence to ask the teacher for assistance in line five. Even when the teacher gave feedback that his English was incorrect (line 6), the student does not seem to lose confidence but instead acknowledges the correction (line 7). This may be due to the correction happening within the context of the game and not in a class. While this is just one example, it does go some way in highlighting how even beginner English-language learners can benefit from GBL.

### **Excerpt 34**

#### *Student Six Communicative Competence*

- 
1. Student 6 (M) inside is dark
  2. Student 6 (M) we need light
  3. Student 1 (M) We can make a light
  4. Student 4 (M) Ask teacher
  5. Student 6 (M) teacher please give light to us
  6. Teacher I have given you torches
  7. Student 6 (M) torches
-

## 6.2 Group Analysis

An analysis of the above findings will be given from a group standpoint with emphasis on the possible gender differences observed in vocabulary acquisition. As a group, the students, regardless of their English-language level, communicated mainly in the K1 to K2 level of vocabulary defined in the BNC (Chien, 2019). As previously outlined in chapter two and at the beginning of this chapter, being able to comprehend and use K1 and K2 level vocabulary is recognized as being able to understand 90% of English texts, which meets the needs of many of the students in this study and possibly the wider Japanese community. In terms of frequency, the number of words used multiple times was mixed, with some students using as many as 20 words multiple times during the gaming session. This is important, as Nation (2006) suggested that students need to be exposed to vocabulary between 5-16 times for incidental learning to be effective. However, not many of the words used as output by the students would fall within this threshold. When we consider the vocabulary the students were exposed to within the chats in Minecraft, it is more likely that some of the words did meet the criteria.

More importantly, the group members could use the vocabulary in a meaningful context using situated meaning (Gee, 2010) while completing tasks. This situated meaning may have made it easier for students to remember and use vocabulary correctly. Using vocabulary, being exposed to vocabulary, and using vocabulary in a meaningful context when considered alone may not have affected students' vocabulary acquisition. However, when all three are present, it is possible that incremental vocabulary acquisition occurred at the K1 and K2 level, which would help students fully understand how to use the essential building blocks of English that are found both as the TL in Minecraft and the K1 to K2 level.

Concerning gender, both male and female students created a student-centered vocabulary language learning environment within Minecraft's written chat. The small-scale

case study nature of this research means that the data is difficult to extrapolate to a larger population. However, analysis suggested that female students used a greater range of vocabulary than male students over the seven gaming sessions, although this range was still within the K1 to K2 level. This finding may suggest, as was pointed out in chapter two, that females gravitate towards more socially-oriented games than males. As the English-language level and gaming experience of males and females, in general, did differ slightly, this may also have been a factor. There was little difference between male and female students in this research in terms of vocabulary acquisition. Female students used a greater range of vocabulary than males. However, all students could use K1 and K2 vocabulary meaningfully and possibly acquired a better understanding and increased confidence in the proper usage of the vocabulary due to the tasks and chat interaction.

### **6.3 Vocabulary Learning Summary of Findings**

Vocabulary acquisition is an incremental process (Schmitt, 2000) and can be achieved through intentional or incidental learning. The purpose of this chapter was to analyze if students could, through the use of written chat in Minecraft, incrementally acquire English vocabulary. This chapter found that Japanese students ranging from the beginner to pre-intermediate level could use TL vocabulary from the K1 and K2 level of the BNC to gain valuable practice with other NNSs in a low anxiety environment. While the K1 to K2 levels only represent the first 2,000 more frequent words in English, these are the fundamental building blocks of the English language and English-language learners need to be able use them appropriately. These lower level building blocks can on occasion, not have enough focus placed on them in the traditional classroom setting, where understanding more difficult vocabulary is viewed as a measure of success. The benefit of using K1 and K2 level words within the chat was that students were able to gain an understanding of them not only from exposure but also from the context and situated meaning. While the data set is small, and the

interpretations of the data have been conducted by the researcher based on his perceptions and beliefs, the findings suggest that there are some possible benefits to using GBL in the classroom. This concept and how it relates to the traditional language learning classroom will be discussed in the following chapters.

## **7. Participant Feedback**

Chapters four five, and six outlined an analysis of the data collected in this research during seven weeks of gaming sessions. Chapter four presented an examination of play measured by the POS in an attempt to establish what categories of play would create the most favorable language learning environment. In chapter five, gaming chat sessions were analyzed for SLA, highlighting how and in what circumstances ZPD was present. Chapter six investigated the language learning of students. The current chapter will provide an overview of the findings obtained from the post study survey are analyzed and compared to the findings of the earlier pre study survey in order to provide a further layer of understanding to this research. Analysis of data will show that in general participants have a positive perception for the use of GBL in for learning English. The data suggests that students believe interacting and completing the tasks in Minecraft was enjoyable, and helped them improve their writing skills.

### **7.1 Post-Gaming Session Survey Results**

A post-gaming session survey (see Appendix eight) was carried out at the conclusion of the gaming sessions to ascertain the opinions of the students in relation to their experience of GBL Minecraft. In total, the students responded to 21 items and open-ended questions on GBL topics, GBL with reference to specific English skills, and questions related to Minecraft. Several of the items were duplicates of the those found on the pre-gaming session survey presented in chapter three, which allowed for direct comparison of the results. In the following discussion, the results will be outlined with a discussion of the differences between the pre- and post-surveys and the implications for GBL implementation.

#### **7.1.1 Understanding of game-based learning and Minecraft**

As shown in Appendix eight the post gaming session survey began with two open-ended questions related to the students' understanding of GBL and Minecraft. The two

questions asked were, “What was your knowledge of GBL before this class? Has your understanding of GBL changed?”

Students generally stated that they knew nothing or almost nothing about GBL before the gaming sessions took place, with student five even adding that she had no interest in games. Unfortunately, none of the students responded to the second question; thus, it was difficult to draw conclusions from this question alone.

The third question in this section of the post-gaming session survey asked, “What was your knowledge of Minecraft before the gaming sessions? “

Only students one and three reported having some knowledge of Minecraft before the gaming session. None of the other students had played Minecraft before the gaming sessions. Student three provided more detail of his pre-gaming session understanding of Minecraft, explaining that that in the game “We craft something.”

The other students had no knowledge of Minecraft, student five commented, “I really knew nothing. Even the tytle [*sic*] I had heard for the first time then,” which the researcher interpreted to mean that the participant had never heard of the game title prior to the research. Student six mentioned that his lack of understanding of Minecraft was the reason, “I had much difficulty understanding how to operate.” The researcher again interpreted this to mean that student six had difficulty in gameplay due to his lack of prior knowledge of Minecraft.

The above responses follow a similar pattern to Peterson (2011, 2012b), outlined in chapter two, in which a lack of knowledge of the game and gameplay created a steep learning curve for the players. This demonstrated that the researcher should have allowed more time in the orientation sessions to explain what Minecraft is and how it works. He could also have provided more detailed game orientation sessions, possibly including some tutorial videos from video sharing sites. Implementing such procedures may have flattened the learning curve created by a lack of knowledge of the game.



### 7.1.2 English Language Learning and Games

As summarized in chapter two, recent studies have demonstrated the positive perceptions students have of GBL. Bolliger et al. (2015), for example, reported the positive perceptions Japanese university students' have towards digital games for English-language learning; similar results have been reported by Hitosugi et al. (2014) as well as Reinders and Wattana (2015). Several items in the survey were used to ascertain student perceptions of English-language learning through digital games.

The pre-game session survey results (see chapter three) indicated that all students in the current study either agreed or strongly agreed that it was possible to learn English through playing games. Encouragingly, the data showed that all students in this research group still agreed with this statement in the post-survey as well. However, student four reduced his response from strongly agree to agree.

The Responses to the pre-gaming session survey highlighted that all students agreed or strongly agreed with the statement, "It will be interesting to learn English through games." The post-gaming session survey data showed that all students still agreed that it was interesting to learn English through playing games. However, there was a slight negative shift, as no students strongly agreed with this statement.

Students one, three, four, five, and six agreed or strongly agreed in the pre-gaming session survey that they learned better through games, while student two was neutral on the subject. The post-gaming session survey data showed that students one, four, and six agreed that their English improved after playing games. Students two and five were neutral, and student three disagreed. This data suggests that there was a slight negative shift in the perceptions of students following the study. However, perceptions were positive overall.

When presented with the statement, "I learn English faster through games."

The pre-gaming session data indicated that students one, four, five, and six agreed, while student two was neutral, and student three disagreed. In the post gaming session survey, students one and four agreed that they learned English faster through playing games, student two and five were neutral, and students three and six disagreed.

Responses to the statement, “I will be more interested and motivated to learn English through games” were varied among the students in the pre-gaming session. Students four and six strongly agreed with the statement, students one and two agreed, student three was neutral, and student five disagreed. In the post gaming session survey student two reduced her perception to neutral, and student five increased her perception to neutral.

For the statement, “I will be able to improve my standard of English through games.” All students agreed with this statement in the pre-gaming session survey. In the post-gaming session survey, student three reduced his response to neutral while students four and six increased their response to strongly agree.

**Table 44**

*Pre- and Post-Gaming Session English-Language Learning and Games*

	S 1 (M)		S2(F)		S3 (M)		S4 (M)		S5 (F)		S6 (M)	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
It is possible to learn English through playing games in English.	A	A	A	A	A	A	SA	A	A	A	A	A
It will be interesting to learn English through games.	A	A	SA	A	SA	A	SA	A	SA	A	SA	A
I learn English better through games.	A	A	N	N	SA	D	A	A	SA	N	SA	A
I learn English faster through games.	A	A	N	N	D	D	A	A	A	N	A	D

I will be more interested and motivated to learn English through games.	A	A	A	N	N	N	SA	SA	D	N	SA	SA
I will be able to improve my standard of English through games.	A	A	A	A	A	N	A	SA	A	A	A	SA

*Note.* SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, and SD = Strongly Disagree

The above results confirm the findings of the literature outlined in chapter two (Bolliger et al. 2015; Reinders & Wattana, 2015). We can see from the data that in the pre-gaming session survey, students had inflated expectations in relation to GBL. Encouragingly, responses to the post study survey were still overall positive. Results indicated that in general, students believe that it is possible, interesting, and better to learn English through games. However, students were more cautious in relation to the speed of learning. This may highlight some reservations about the academic nature of learning and games. These results provide more evidence for the need identified in chapter one for a hybrid-style classroom where both traditional methodologies and GBL are utilized to cater to language-learner preferences.

### 7.1.3 Game-Based Learning and the Four Skills

The discussion in this session outlines the pre-gaming session and post-gaming session survey results related to, listening, speaking, reading, and writing. In the pre-research orientation, the method of the Minecraft gaming lessons was clearly explained to the students. The seven 50-minute gaming sessions required the students to use Minecraft's chat function to interact and complete tasks related to the building of a virtual university. Below is a summary of the results.

The first statement related to student opinion on English listening ability through playing Minecraft and using the chat function to complete tasks in English, “My English listening skill will improve after playing games in English.”

A table of the pre-gaming survey results can be seen below (Table 45). The results of this statement were unexpectedly positive. Students one, two, four, five, and six agreed or strongly agreed with the statement, while only student, three, indicated he was neutral. The post-gaming session survey data demonstrated that expectations had decreased among the students concerning improving listening skills through games. Students three and six now disagreed with this statement while students one, two, four, and five were neutral.

As with the previous statement, students were told in the pre-gaming orientation session that Minecraft tasks would involve written chat interaction between students. Even so, for the next statement, “My English speaking skill will improve after playing games,” Students two, five, and six agreed with the statement, while students one and four were neutral, and student three disagreed. The post-gaming session survey data again highlighted that expectations had decreased. Data showed that students one, four, and five agreed with this statement while students two, three, and six were neutral.

The researcher believes that the results for the two skills, speaking and listening, not directly used in this research, indicate that students had predetermined and inflated expectations for GBL after participating in the orientation. It appears students mistakenly believed there would be opportunities to listen to and speak English within the chat. The researcher theorized that this could be due to outside sources such as video sharing websites and social media that often depict in-game chat as informal oral conversation related to gameplay.

The next two statements in the survey queried students regarding reading and writing. These two skills were directly needed to interact with other students while completing the tasks. Concerning the statement, “My English reading skill will improve after playing games,” students four, five, and six agreed or strongly agreed with the statement. Student one was neutral, and students two and three disagreed. Data from the post-gaming session survey

shows that students four, five, and six still agreed with the statement, although no students strongly agreed. Student one stayed neutral, with students two and three becoming more accepting of the statement by moving from disagree to neutral.

In relation to the English skill of writing, students were asked to respond to the statement, “My English writing skill will improve after playing games.”

Students one and four were neutral in the pre-gaming session survey responses, while students two, three, and five strongly disagreed. Only student six agreed with the statement. In the post-gaming session survey, data indicated that attitudes had shifted. All students then either agreed or strongly agreed that their writing skills did improve by using the chat function in Minecraft to communicate.

Students were explicitly told in the pre-gaming orientation session what was required of them during the seven 50-minute gaming sessions. It was emphasized that they would need to chat with other students in English to complete the tasks assigned to them. The researcher believes that students' slightly negative perceptions in the pre-gaming session survey could be due to one of several reasons. One possible reason may be the perception that reading and writing are supposed to be academic, while chat conversation is not, however no data was collected in the survey to prove or disprove this. For example, the perception of improvement in reading might be that students expect to learn and improve their skills from books. Textbooks and novels have an image of authority and academic rigor, while the short and possibly grammatically incorrect utterances of fellow students in chat do not hold the same image.

**Table 45**

*Pre- and Post-Gaming Session Survey Results for English Skills*

S 1 (M)		S2(F)		S3 (M)		S4 (M)		S5 (F)		S6 (M)	
Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post

My English listening skill will improve after playing games in English	A	N	A	N	N	D	SA	N	A	N	A	D
My English speaking skill will improve after playing games	N	A	A	N	D	N	N	A	A	A	A	N
My English reading skill will improve after playing games	N	N	D	N	D	N	SA	A	A	A	A	A
My English writing skill will improve after playing games	N	SA	D	A	D	A	N	A	SD	A	SA	SA

*Note.* SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, and SD = Strongly Disagree

The above results highlight essential issues for implementing GBL into a hybrid classroom. These will be discussed in the next chapter. From the data discussed here it appears crucial that students are fully informed before embarking on a project involving digital games so that they do not have inflated expectations. As seen from the feedback above, students generally believed their speaking and listening skills would improve through playing Minecraft and chatting in written English. It was only after the gaming sessions that their perceptions changed. For reading and writing, the opposite occurred. Students were negative in the pre-gaming orientation session survey and became more positive in the post gaming session survey.

#### 7.1.4 Minecraft Gaming Session Questions

Aside from comparative questions regarding GBL, the students were also asked some more general questions in the survey about the gaming sessions. Initially, students were asked what they had found enjoyable (if anything) about the project class. The responses indicated that students thought the gaming session classes were fun and enjoyable. Four of the six students mentioned that communicating with friends was an enjoyable factor of playing

Minecraft, while three students identified the game as an enjoyable element. Two students said that creating something in Minecraft was enjoyable, and one student believed GLB was enjoyable. The following comment from student three highlights this positive feedback, “It is enjoyable to build something with others, communicating with them. If an activity is completed in the class, students willingly participate in this activity.” The positive perception demonstrated here provides some hope concerning the implementation of GBL into hybrid classrooms in the future.

When asked if there was anything they did not like about the class three students answered no, and two other students mentioned the difficulty of the tasks, similar to Peterson's (2012b) findings. As outlined in chapter three, the researcher became aware that the weekly tasks were too difficult to complete during the first gaming session and adjusted them accordingly. Setting a task at an appropriate level is an essential matter in GBL. If a task is too easy, students can lose interest and stop playing the game, and if the task is too difficult, students can become frustrated and stop playing the game. One student mentioned that he did not have enough time to learn vocabulary. From the perspective of that student, this may indicate a desire for drill-and-repeat language-learning games in which the acquisition of vocabulary is more quantifiable. For the researcher, this feedback provides evidence that it is impossible to satisfy all students in any educational intervention.

In an extension to the previous statement regarding writing, students were asked two questions, “How would you describe your written English level before this class?” and “Has this class helped improve your written English level? If yes, how has it improved it? If no, then why not?”

For the first question, the results provided some insightful feedback. Firstly, student five commented, “My English skill was getting poorer and poorer. Although I had studied English hard before entrance exam, I rarely studied English after I became an undergraduate.”

This highlights an issue noted in chapter two namely the entrance exam system and the lack of English input in Japan. This student seemingly reached her peak English-language level before entering university and since then has had little opportunity to maintain or increase her level. GBL classrooms may assist students like this build upon their entrance examination study using that acquired knowledge in a GBL situation. For the second question, three students answered positively, with student two stating, “Maybe a little with using some expressions through talking with friend, so I can use some easy expression more immediately.” Using the chat function to complete the tasks seems to have created two positives for this student. Firstly, she had access to expressions "more immediately." This indicated that chatting in Minecraft helped her learn "expressions" and has given her the confidence to use them. Secondly, student two had been able to create friends outside of the gaming environment. It is impossible to know the relationship between the students before the gaming sessions began. However, it was not immediately apparent to the researcher that any of the students knew each other as they came from different grade levels and departments within the university. In chapter 2, similar findings were reported (Peterson, 2012b; Hitosugi et al. (2014) in which the use of the game allowed participants to attempt language they would not be able to in a classroom setting. This result has positive implications for the implementation of hybrid classrooms, as it demonstrated that playing the game also provided students with the opportunity to practice social skills.

However, not all responses to this question were positive. Student four did not believe his writing skills had improved stating, “I used vocabularies [sic] and sentences that I have already known.” While the student may believe that this is negative, it also could be a positive. Practicing vocabulary and phrases will allow the student to gain a greater understanding of their usage. This may assist lower-level assist lower-level students to reach a



higher level of understanding. However, this may again highlight the need for some form of drill-and-repeat exercises to be worked into any future GBL classroom.

Students were also asked the question, “What do you think about playing Minecraft in English as an English learning activity for the classroom?” Here the answers were generally positive. Two students stated that it was difficult, while another said it was fun and helped with collaborative learning. Student two provided a more detailed response, stating, “I think we can improve the communicative skills in English. But, we tend to use easier expression so we can't increase number of expression we use.”

In a similar way to the previous question, it was positive to see this student understanding how collaborative learning can be a beneficial aspect of GBL. However, the dissatisfaction with the level of difficulty again suggests the need for additional learning activities in any future GBL classroom.

In the next question, students were asked, “What did you think about chatting with other Japanese students in English using the chat function in Minecraft?” Most students gave positive answers indicating how fun it was and how it was a precious experience. However, student three stated, “At first I was too shy to talk so someone” However, it seemed that the seven gaming sessions gave students the opportunity to overcome this shyness and to become active members of the group. Student six stated, “In daily life we talk in Japanese, so I feel strange.” It was unfortunate that student six felt this way about communicating in English with Japanese people. However, other responses from student six indicated that overall he felt he benefitted from the GBL experience. From the context, it is difficult to predict if he was talking about the entire seven weeks of gaming sessions or the first gaming session.

## **7. 2 Post Gaming Session Reflection Summary**

This chapter has outlined learner feedback data and showed how the opinions of the students who took part in this research changed over the seven-week gaming sessions. The

results indicate that prior to the study, students knew little about the game Minecraft. The survey responses showed that the attitudes of students towards the possibility of improving their writing and reading skills through playing Minecraft and interacting within the chat function became more positive. While there were many positives from this survey, the results also indicate areas that require improvement. For example, the difficulty of the tasks was an aspect many students mentioned. Overall, the surveys presented more evidence for the need for hybrid GBL language classrooms in the Japanese education system.

## **Chapter 8: Discussion**

### **8.1 Addressing the Research Questions**

This section will discuss the findings of the research results and compare them with other studies to develop a clear understanding of where this research resides within GBL. The discussion will be divided into three parts that align with the research questions presented previously.

### **8.2 Does Task-Based Interaction in a COTS Digital Game Facilitate TL Vocabulary use?**

There are some ways in which the task-based interactions in COTS digital games facilitate TL vocabulary. As the chat discourse used to complete the tasks was conducted in the TL, this likely benefited students' K-level vocabulary comprehension. In chapter two, Nation's (2006) concept of 5-16 exposures to vocabulary for acquisition to take place was introduced. In this case, exposure would consist of both writing messages and reading messages in the chat. As stated in chapter six, the students in the gaming sessions had a vocabulary level mainly in the K1 and K2 range, equivalent to understanding the 2,000 most common words in English. While the games did not provide significant opportunities for the students to go beyond the K2 level, it did provide students with a chance to increase their communicative competence related to vocabulary use. Results showed that students had opportunities to practice K1 and K2 level vocabulary and have NNS interaction within Minecraft's chat function while completing the tasks. Since the K1 and K2 level words are the building block of English, it is possible that playing Minecraft and interacting with NNS through written chat provided students with more opportunities than in a formal classroom setting to become proficient at this level and increase their English-language communicative competence.

Another way Minecraft facilitated vocabulary use and increased the students' English-language communicative competence was by creating a low-anxiety environment. In a

classroom setting, some anxieties can prevent students from participating in the class. These are often related to the anxiety of using a foreign language in front of classmates, the anxiety of utilizing incorrect output, and anxiety associated with being corrected in front of their classmates. In the researcher's experience, this anxiety has often left the language learning classroom a quiet place where only a brave few contribute.

Analysis in this research suggests that the game environment was a crucial factor in facilitating vocabulary use. At first, this low-anxiety environment allowed students to take on roles they would not usually attempt in the classroom setting. In chapter six, an example was presented in which student four took on a leadership role within the game, even though he had less gaming and experience and was a lower-level proficiency English learner than the others in the group. As his attempts to lead the group in the TL were successful, he gained confidence and attempted to interact using vocabulary with the correct level of formality. That is, he used "Please" correctly (see Excerpt Nine, line eight). Of course, "please" could be practiced in a classroom setting. However, the combination of the low-level student assuming a leader's role and initiating the correct formality usage of the vocabulary suggests that this is possible due to the game.

A further way in which games facilitated TL use was through ZPDs. As presented in chapter two, in the ZPD, the individual learner can complete functions through collaboration with a more knowledgeable peer that they would not be able to do by themselves. In chapter five, several examples of ZPD were presented that showed the benefits of using games. For example, two minimal peer mistakes were highlighted, "grass/glass" and "bat/bad". Both examples were successfully noticed and corrected by other team members within the chat. The student who made the mistake learned the vocabulary, and the minimal peer mistakes were not observed again. Minimal peers can also be taught in the classroom setting, but the mistakes could also be missed due to such things as the class size.

The discourse of the chat interaction was conducted in the TL. This means that for the 50-minute gaming sessions, the students were reading and writing in English to complete their assigned tasks. In addition to this, the interactions were NNS-NNS, which was identified in chapter two as a meaningful way for students can learn. A classroom environment can also provide NNS-NNS interaction opportunities; however, most foreign language classrooms have periods of NNS-NNS interaction in the TL, followed by lengthy teacher-led explanations meaning students have less time on task.

Utilizing the chat function to complete tasks also provided opportunities for informal language usage. In chapter six, some examples of humor were evident. The use of “haha” by one of the students when being corrected on their language use may have come about due to the student’s low-anxiety level while communicating in chat. The informal “haha” is unlisted in terms of K-level. Yet, being able to use it appropriately could help students increase their communicative competence. Informal language usage is often overlooked in a formal language learning situations as the skill is not considered necessary to increase vocabulary knowledge that will assist in passing standardized tests.

The above discussion has highlighted many ways in which task-based interactions in COTS digital games facilitate TL vocabulary learning. What is important to note is that there is no single aspect that is key to language learning through games. All aspects contribute in different ways, but the results of this research showed that vocabulary language learning is possible through games.

### **8.3 What Differences in In-Game Interaction are Observed Between Male and Female Participants?**

This research was conducted using six case studies, four males and two females. Using a mixed-method approach, the researcher has attempted to understand differences in in-game interactions between male and female participants.

When it comes to foreign-language learning, studies of French, Spanish, and German have demonstrated how males lack interest compared to females (Kissau, Kolano, & Wang, 2010). In addition, males and females have been shown to differ in their enjoyment and motivations for playing digital games (Chou & Tsai, 2007; Wright et al., 2001; Jansz, Avis, and Vosmeer, 2010; Olson, 2010), with males more interested in interpersonal interactions, competition, and the challenge. In chapter three, the concept of green-brown and pink games was explained. This is a continuum of sorts with green-brown games on one side favored by male students. These games are generally competitive, such as first-person shooting games. On the other end of the continuum are pink games, which are believed to be more social. Minecraft, the COT selected for this research, can be played in a competitive mode (survival) or a more social mode (creative). The researcher selected creative mode as it took away some of the uncontrollable elements such as zombies, giant spiders, and bow and arrow wielding skeletons that could distract from the main task of building a university.

From examining the play data in chapter four, differences could be seen in the way males and females interacted in Minecraft. The females in the group had little gaming experience between them and began the gaming sessions by figuring out the mechanics of Minecraft through exploratory play in the Minecraft environment rather than focusing on the task that needed to be completed. As outlined in chapter two and four, exploratory play is defined as a focused examination of an object to obtain visual information about its specific physical properties. In this research, exploratory play is where the participant may be examining an object on his/her screen in the game that is not directly related to the task but is still within the Minecraft environment. An example of this is presented in chapter four. It shows the two female students discussing how the flower looks pretty rather than completing the Minecraft task.

Another type of play seen in female students more than males was observable behavior. Observable behavior in relation to this research is where the participants stop what they are doing and observe their screen or someone else's screen. Chapter four demonstrates the observable behavior of female students. In this example, one female student leaves Minecraft due to a technical issue. The other student waits for her to return before interacting with her about her reason for leaving the game. She spends time observing the student leaving Minecraft rather than working within Minecraft's chat function with her group to complete the task.

However, within two 50-minute gaming sessions, both female students spent most of their time in group play, a subcategory of social play in which participants play with other participants, and there is a common goal or purpose to their activity. This means that for the majority of weeks three to seven, the female students could engage in meaningful NNS-NNS interaction within Minecraft's group chat while working on completing the virtual university campus. As outlined in chapter two, NNS-NNS interactions are considered to be beneficial for learning (Adams, 2007) and crucial in the process of learning (Levy & Stockwell, 2006).

In the first week of the gaming sessions, the male students were observed in group play significantly more than the female students. This was due to the male students seemingly being more focused on completing tasks within Minecraft compared to the female students. Through this NNS-NNS interaction, the male students had opportunities to practice, receive feedback on, and ultimately use the TL from week one. We can see, for example, in chapter five, an instance of ZPD for student six, which is led by student one. In this instance, student six asked for clarification of the word *unlimited*, for which the feedback of *no finish* was provided by student one and acknowledged by student six. The word *unlimited* directly references the type of environment in Minecraft.

As with the female students, for the male students, there were also instances in which the group play observed focused in relation to the game mechanics of Minecraft. These NNS-NNS student-led interactions were mainly observed in the first week of the seven gaming sessions. For example, in week one, student six requested information on how to fly, which is then provided by student one. However, for the male students, the game mechanics interactions were observed less frequently.

There are many possible explanations for week one and week two differences in male and female students' interactions. Firstly, it could be related to the previous gaming experience of students. However, looking at the pre-gaming session survey data in chapter three, it would seem that this is not the case in this instance. Only student one (M) reported any significant gaming experience, 30 minutes per day, with student two (F) being the next most experienced at 30 minutes per week. The four other students reported almost no gaming experience. Due to this, more game mechanics questions may have been expected from both male and female students in week one. The researcher also investigated if English-language level caused the differences. However, pre-gaming session survey data suggested this had little influence as both female students were categorized as pre-intermediate English-language learners; the male students ranged from advanced beginner to pre-intermediate. There was not enough range between the students to suggest that this could have any influence.

Before the seven 50-minute gaming session took place, all six students spent two weeks learning how to play Minecraft through orientation sessions. In these orientation sessions, the students explored the game and practiced Minecraft's basic game mechanics that would be needed to complete the tasks during the gaming sessions. The researcher's observations indicate that the male students were, in general, able to comprehend the game mechanics of Minecraft within the orientation sessions more than the female students. However, no data from the chat sessions was collected during the orientation sessions.



As the weeks progressed, the female students continued to participate in NNS-NNS interaction within Minecraft's chat function and, based on the number of interactions, became more dominant than the male participants. The male students focused on completing the assigned tasks within Minecraft and spent less time on NNS-NNS interaction. It is possible that, in general, the female participants benefited more from the NNS-NNS interaction when completing tasks within the chat function of Minecraft. However, no concrete conclusion can be made due to insufficient data.

#### **8.4 How does Student Perception of GBL Develop During the Research Period?**

##### **Furthermore, What are the Reasons for the Changes (if any)?**

Previous research on the topic of digital games and GBL in Japan has produced mixed results. In chapter two, Bolliger et al. (2015) found in their survey of 222 university students that even though some students played games up to 80 hours per week, they did not consider themselves gamers, and while interested in using games in the classroom for learning, they did not believe it was a long-term learning option. Peterson (2011, 2012a, 2012b, 2013) investigated the multimodal opportunities created through the use of MMORPGs and found that games provided overwhelmingly positive results for peer feedback. While York (2019) stated that virtual worlds might hinder output fluency, they have little effect on complexity and accuracy but increase lexical density.

In chapter six, data on student perceptions, both pre- and post-gaming sessions, were outlined. This allowed for a deeper understanding of the students' perception of using Minecraft and tasks to assist in learning English. For English-language learning through pre- and post-gaming session survey data suggests that the results were mixed.

In general, the perception for all the statements related to English language learning and games remained positive from the pre-gaming session survey to the post-gaming session survey. Even so, many of the statements had a slight negative shift. This was evident in the

perceptions expressed to the statement, “I learn English better through games.” In the pre-gaming session survey the data showed that the perceptions of five of the six students were agree or strongly agree. However, after the seven 50-minute gaming sessions the perceptions had become slightly more negative with two neutrals and one disagree. This demonstrates that the students had an opportunity in the seven 50-minute gaming sessions to analyze for themselves if a traditional teaching methodology or GBL was more appropriate for them. Encouragingly only one of the six students would seemingly like to return to a traditional classroom situation.

One exception to the above is seen in the statement, “I learn English faster through games.” In the pre-gaming session survey three of the five students agreed with this statement. However, after the seven 50-minute gaming sessions only two students still agreed with this statement. This has some implications for GBL in a hybrid classroom. Students are usually interested in the fastest way in which they learn something. If most students believe that learning traditionally is quicker than GBL then this may have some negative implications for their future use of this methodology.

The results of the above statements give a little insight into students' perceptions concerning GBL. In general, all English aspects of GBL perceptions were positive in both the pre- and post-gaming session surveys. The minor negative changes in the perceptions may have indicated that the research orientation undertaken was successful and that overall, students did not enter the research with inflated expectations concerning English-language learning and games. From an English-language learning perspective, the results show that students, in general, have a positive perception of various aspects of GBL. This is crucial for any future implementation of GBL into a classroom context. However, the research acknowledges that the research sample is small, and as such, no firm conclusions can be made.

When surveyed about their potential gains in listening, speaking, reading, and writing skills and GBL the results had some fluctuation. For example, for listening and speaking skills, the students had positive perceptions in the pre-gaming session survey and slightly more negative perceptions in the post-gaming session survey. Interestingly, the gaming sessions only focused on written chat within Minecraft and the reading of this chat. There was no speaking or listening aspect to the study. The researcher believes that students either did not make this connection in the pre-gaming session survey or thought about the question from a general GBL context. Whatever the reason, it was encouraging to see students with a positive attitude towards these skills and GBL.

For reading and listening, the perception with GBL data also showed high levels of fluctuation. When asked if their reading skills would improve after the gaming sessions, there was a relatively even split between those who thought it would and those who thought it would not. For writing the pre-gaming session survey found mainly negative results while this changed to all positive in the post-gaming session survey. The researcher believes that this may have occurred due to the students having a stereotypical gaming image of interaction via speaking and listening to other group member and little to no reading and writing. Even though the students were informed of the gaming procedures before the pre-gaming session survey took place, it is possible that the students did not process that information correctly. The swing to positive attitudes for these skills in the post-gaming session survey shows that the students recognized the importance of reading and writing to this research and see how their NNS-NNS interaction in Minecraft was of a benefit to their reading and writing.

Finally, comments from the participants although not taken in the pre-gaming session survey seemed to indicate some positive perceptions of GBL. In relation to writing, one student highlighted the gaming sessions' positives as she felt her written English level had decreased since entering university. One student believed that the gaming sessions had helped

him improve his writing a little. Another student mentioned that the gaming sessions allowed them to remember and use expressions more readily than before the study. Not all the comments were positive however, with some students saying the vocabulary they understood and used did not change, and another student mentioning how it was strange to communicate with other Japanese people in English.

While the sample size in this research prevents any conclusions being extrapolated to the general population, there was a general consensus among the participants that GBL and the use of games for formal learning was positive. Students could see the potential benefits of NNS-NNS student-lead learning, such as using the chat function in Minecraft to interact together and complete tasks. It could be assumed that the students undertook the pre-gaming session survey with somewhat high expectation levels, which were tampered slightly by their experience during the study but remained positive overall in the post survey.

### **8.5 What Potential Opportunities Presented Through the Gaming Sessions, if used in Traditional Classroom Settings, could Improve Target Language use?**

The final research question looked at the potential opportunities presented in the gaming sessions and how they could be used in a traditional classroom. In chapter two, literature was presented that theorized that if students had a low affective filter, that is, students had high self-confidence, a positive attitude, low anxiety, and high motivation (Krashen, 1981), they were "likely to concentrate on language learning, use the L2, accomplish a task, receive comprehensible input, and acquire another language" (Reinders and Wattana, 2015 p. 39). As noted in this research, GBL provides significant opportunities for NNS-NNS interaction due to the low anxiety present during the activity. Data from this research indicates that this NNS-NNS interaction allowed the students to interact together while completing the tasks within Minecraft's chat function to create a low-level anxiety environment in which "stealth learning" (Prensky, 2001, 2006), was possible.

Previous qualitative studies of Japanese university students outlined in chapter two (Peterson, 2011, 2012a, 2012b), which focused on chat message exchanges provided overwhelmingly positive results for the feedback received from peers in MMORPGs. However, this feedback was given under the anonymity of avatars in place of real names. This contrasts with the current study in which the students knew who they were communicating with and possibly had some relationship outside of the classroom.

The traditional classroom setting in Japan has been shown in chapters one and two of this research to be one which has changed little since the 1940s. In the traditional classroom, the teacher is the authority figure. The language-learning classroom in Japan is no different. Lessons are often given using a grammar-translation methodology and are teacher-centered. The teacher is the authority figure within the classroom, and learners are encouraged to memorize and repeat rather than work towards autonomy. GBL could be used in the English-language classroom in Japan to improve the learning experience of students.

In chapter two Levy and Stockwell (2006), reported that learning as seen from a social constructivist viewpoint occurs within a social context, and highlights interaction between peers as crucial in the process of learning. In this research, play was measured using the POS (see chapter 2). It is this play that could enhance the learning experience of students in the language-learning classroom. Within the POS, group play and exploratory play were identified as the categories that were the most interactive and created the greatest opportunities for NNS-NNS interaction. Group play is a subcategory of social play in which participants play with other participants, and there is a common goal or purpose to their activity. Exploratory play is a focused examination of an object to obtain visual information about its specific physical properties. In MMORPGs these types of play are essential in completing the common goal. In this research, the goal was to build a virtual university in Minecraft through written chat interaction.

Examples of group play from chapter four demonstrated how NNS-NNS could interact together in the TL to complete the common goal. In chapter four (Table 19) for example we can see the students interacting together in English to decide on the building. Through NNS-NNS interaction the students were able to negotiate and decide on an appropriate style for the building. Here, the use of Minecraft and written chat has given the students a meaningful opportunity to use language and has given them opportunities to use social skills such as negotiation, an affordance of MMORPGs that is difficult to replicate in a teacher-centered classroom. Regardless of gaming experience and language ability of the students, when they were observed in group play they were able to interact together towards the common goal of creating a virtual university.

Exploratory play could be even more important for the traditional language-learning classroom. Here, the TL is often only used during group work or exercises. With GBL and exploratory play the TL is used as a means of communication, giving students more opportunities to use the TL even if not focused on the goal. An example of this can be seen in chapter four (Table 15). Here student two and student five should be interacting to build the virtual campus in Minecraft. Instead, they discuss the flower they recently found. This exploratory play would likely be discouraged in the traditional language learning classroom as it is not on task. A more likely scenario is that the students would discuss the flower in their native tongue in the traditional classroom and only use the TL for specified TL interaction times.

GBL in this research has been shown to have the ability to reduce the anxiety of students, which is an important aspect to consider in any language learning classroom. In chapter five, we saw how the language level of students did not prevent them from being an active member of the class and participating in NNS-NNS interactions through chat in Minecraft. Student six, the lowest level English-language learner of all the students, still felt

comfortable enough, within the group to communicate with them in English. Although results of the post-game session survey received a comment from student six that it was strange to communicate with other Japanese students in English. He still interacted with the group members within the chat function of Minecraft. This type of interaction was partly made possible due to the reduction of anxiety GBL provides (Jabbari and Eslami, 2018).

The anxiety reduction was also seen in the way the ZPD was observed in NNS-NNS interactions. In chapter five, one example of ZPD was shown when student five corrected the minimal peer mistake of student two's "*grass/glass*". This student-led learning assisted student two in modifying her output and learning or becoming aware of the need to be careful when using "*grass/glass*". In addition to this, how humor was used by both the student who received the correction and the student who gave the correction provided evidence for GBL as a means of both creating a NNS-NNS environment in which ZPD can occur and an environment where the anxiety is at such a level that students can make mistakes and others can correct the mistake without either of them feeling anxious.

## **8.5 Summary of the research questions**

In this chapter, the researcher has attempted to address the four research questions outlined above. Concerning the first question: *Does task-based interaction in a COTS digital game facilitate TL vocabulary use?* Data showed many aspects that contributed to vocabulary use, including the student's current language level, the level of anxiety, the use of formality and humor, the roles undertaken by students, and ZPD. Many aspects contribute to understanding this question, but ultimately, the researcher believes that the use of games does facilitate TL vocabulary use.

The second question was: *What differences in in-game interaction are observed between male and female participants?* The female students in this research had a steeper learning curve than male students. This ultimately caused them to spend significant amounts

of time figuring out the game mechanics of Minecraft. The male students, in contrast, were able to focus on NNS-NNS in the TL and related to the task. However, from the third gaming session, the female student participated in as much task-based interaction as the male students became more involved than the male participates.

The third question: *How does student perception of GBL develop during the research period?* Furthermore, what are the reasons for the changes (if any)? This question demonstrated that students began the gaming sessions with a slightly overinflated perception of GBL and its potential for English language learning. After the gaming session, these perceptions decreased; even with this decrease, the data suggested that students perceived digital game use positively and could see the potential benefits of using them in a hybrid classroom situation.

The final research question asked: *What potential opportunities presented through the gaming sessions, if used in a traditional classroom setting, could improve TL use?* The data here clearly shows that there are opportunities. First, NNS-NNS interaction is a positive student-led way in which students have the potential to learn. Bringing games into the classroom would give students more opportunities for this to take place. In addition, and as outlined above, games provide a low anxiety method of interaction in which students can use many different approaches to improve their communicative competence.

However, it should be noted that the discussion is based upon the beliefs of the researcher and on his own experiences and understanding of the issues. The researcher understands that the data interpretation and current discussion might vary if viewed from a different perspective.



## **Chapter 9: Conclusion**

In the previous chapter, a discussion on the research questions took place based on the collected data analysis and related literature. This chapter will summarize the key findings and limitations of this study before discussing the future implications of this research.

### **9.1 Importance of this Study**

In chapter one, the reasons and the importance of this research were discussed, a summary of which will be outlined in this section. As was stated at the beginning of chapter one, Japan has a problem; it is trapped in the expanding English influence circle. Although there is a desire for effective English communicators, this does not seem likely to occur. Japan is located in the expanding circle of the concentric circle model (Kachru, 1985) with a desire to move inwards, but they are finding this difficult to achieve. MEXT is implementing new strategies in an attempt to move inwards, including starting English education at an earlier age and planning to implement an English-speaking test for the national university entrance examinations. To date, none of these strategies have had the desired effect, and many Japanese people still lack basic English communicative competence.

With the renewed importance placed on English as a test subject and means of communication in Japan, new methodologies for increasing Japanese students' communication competence need to be explored. Even though some companies, such as Rakuten, mentioned in chapter two, have taken it upon themselves to increase the English communication competence of their workforce by introducing the language at a management level, more needs to be done during the formal education of students to ensure learners have the best chance of attaining an appropriate level of English communication competence for their future needs.

As was noted in chapter three and the previous chapter, the current study aimed to address the following research questions:

1. Does task-based interaction in a COTS digital game facilitate TL vocabulary use?
2. What differences in in-game interaction are observed between male and female participants?
3. How does student perception of GBL develop during the research period? Furthermore, what are the reasons for the changes (if any)?
4. What potential opportunities presented through the gaming sessions, if used in a traditional classroom setting, could improve TL use?

The current discussion reexamines the importance of this study in the Japanese context as the country seeks additional ways to increase their English communicative competence. The research questions above were used in the previous chapter to discuss more specific ways in which this study has shown that GBL is a tool that could create increased English communicative competence. Below is a summary of the position taken and some of the essential concepts articulated this study that will be revisited.

## **9. 2 Play**

While the research on GBL in the Japanese context has increased in recent years, the researcher could find little literature on the nature of learner play in digital games in Japan. The results of this research will therefore shed light on this previously unresearched phenomenon.

The data from the seven 50-minute gaming sessions were analyzed in several ways. As outlined in chapter three, play was one of the concepts used to gain a layer of understanding of the data. Play and the POS (Rubin, 2001) were presented in chapter two. This scale has been modified for use in research to take into account the concept of GBL. POS used in this research has three major categories, social play, cognitive play, and non-play behavior and various subcategories. The researcher analyzed play to understand the language

learning opportunities afforded to Japanese students by interacting together in English within the chat function of Minecraft while completing weekly tasks.

The seven 50-minute gaming sessions were divided into ten five-minute segments, with the researcher assigning a category to each student for each segment based on his understanding of the categories. The finding of play in this research are unique as the research was not able to find any literature that had attempted to analyze the type of play engaged in by language learning when using digital games in the Japanese context.

The results of the analysis of play indicated that there were encouraging findings for using the learning opportunities afforded. The social play subcategories of group play and, to a lesser extent, exploratory play emerged as the dominant types of play observed over the seven gaming sessions. As defined in chapter two, group play is a subcategory of social play in which participants play with other participants, and there is a common goal or purpose to their activity. Exploratory play is defined in chapter two as an instance of play where the participant may be examining an object on his/her screen in the game that is not directly related to the task but is still within the Minecraft environment.

Data analyzed over the seven 50-minute gaming sessions showed how the task of building a virtual campus in Minecraft using the in-game chat in English created an environment in which NNS-NNS interaction compelled use of TL. In week one and week two, most frequent instances of exploratory play occurred. While not task-based, this type of play led to meaningful NNS-NNS interactions, which in chapter two were shown to be necessary for language learning (Adams, 2007).

Group play was the most dominant category of play observed in the gaming sessions from week three onwards. As stated above, group play occurred when NNS-NNS interacted together within Minecraft's chat function to complete the task of building the virtual university. In chapter four, we saw how analysis of the conversation data had many instances

of group play. Through NNS-NNS interaction, the students worked together in an attempt to complete the goal. Having the goal and communicating via written text seemed to allow the students to transcend the individual student's English language level, gaming experience, and gender to create a low anxiety environment in which language learning opportunities could occur through NNS-NNS interaction.

In chapter two, it was reported that the Japanese educational system has historically lacked an element of play (Cox, 2002), continuing with a teacher-centered grammar-translation methodology for English-language learning classes. Play through the affordances that games, including Minecraft provide, may give Japanese students the opportunity to learn in a low-anxiety environment and use language they would not attempt in a formal classroom setting. The following section will summarize the results of the analysis into the Minecraft chat.

### **9. 3 Minecraft Chat Analysis**

This section will summarize the significant findings of the in-game chat used in the gaming session to complete the tasks. As outlined in chapter three, the students in this research were required to use the chat function to communicate together in written English to complete the task of building a virtual university campus. The conversations were compiled and analyzed by the researcher from a naturalistic position (Richards & Rodgers, 1994), that is, how SLA is occurring naturally through completing tasks and chatting in written English.

The conversation data demonstrated instances of ZPD (Vygotsky, 1978), defined in chapter two as the distance from where the student is at in their development process and where they could be with the help of a more knowledgeable other. Through ZPD, NNS-NNS collaboration and social interactions allowed individual learners to complete functions that they would not have been able to do independently. The ZPD instances within the Minecraft chat came in various forms.

The first form was NNS-NNS clarifying the meaning of an unknown word. Through an information request from the first NNS, the second NNS was able to provide the requested definition using user-level appropriate vocabulary. The second form was an NNS-NNS vocabulary correction. In these instances, the first NNS would use an incorrect word, which in this research was often a minimal peer error such as seen in chapter five. The second NNS would then provide feedback to the first NNS questioning the vocabulary's use, prompting the first NNS to modify their output. When this initial feedback still did not supply sufficient information, the second NNS would provide more detailed feedback. This later feedback was often enough to prompt the first NNS to correct their output. One of the advantages of using games in language education is that they create a lower level of anxiety and less fear of confrontation (Jabbari & Eslami, 2018). Data from this research (chapter 5) suggests that this aspect of gaming may have encouraged the operation of ZPD.

The current section has attempted to summarize the findings of the analysis of the Minecraft in-game chat. The findings here have demonstrated that chatting in English within Minecraft's in-game chat function provided second-language learning opportunities to occur through the provision of NNS-NNS interaction and the elicitation of ZPD. Students were also able to employ strategies such as humor to maintain a low anxiety learning environment.

#### **9.4 Vocabulary analysis**

Chapter six analyzed the interaction of the learners in each case study based on their K-level (Nation, 2006). In chapter two, it was suggested that if a student knows 15,851 individual words, they would understand 97.8% of English texts. However, this would be a very advanced learner and is well beyond the scope of the current research. Data in this research highlighted that the students mainly used language from the K1-K2 level, with a vocabulary size of around 2000 words, covering up to 90% of written text. The students would, on occasions, use words beyond the K2 level, but for usually less than 10% of all vocabulary used.

This chapter's results highlighted the incremental nature of vocabulary learning for the students in Minecraft. It was suggested in the literature that students need between 5-15 exposures to a vocabulary item for it to become knowledge. Based on an analysis of the data regarding students' written output, very few words were used more than five times. What was more important than the number of times the word was used was the context in which it was used. Minecraft facilitated vocabulary use and increased the students' English-language communicative competence by creating a low-anxiety environment. Students could take on roles or use social skills they would usually avoid in face-to-face situations because of a lack of communicative competence, a lack of enjoyment, and a desire to maintain social harmony within the class. Several examples of this were present in chapter six, including one example, Excerpt 31, in which student three takes on a leadership role to keep his group members focused on completing the task. In another example, Excerpt 34, student six used the TL to make a request from the teacher after discussing in the group whether asking the teacher was indeed the best option available to them. Moreover, in a noteworthy finding all of the NNS-NNS interaction took place using the TL. It is possible, given the meaningful context in which TL was used, that students could have experienced some incremental vocabulary increase. In a traditional classroom setting, drill-and-repeat exercises are often used to increase understanding or exposure to the vocabulary which results in learning. However, it could be argued that the meaningful way in which students used the TL in the game provided them with better opportunities to understand how and in what circumstances vocabulary can be used. The next section will outline student perceptions concerning this research and GBL in general.

### **9. 5 Student perceptions**

Chapter seven of this research used surveys incorporating 21 items and open-ended questions on GBL topics in general, GBL regarding specific English skills, and questions

specific to Minecraft to understand student perceptions from pre- to post-gaming sessions. In relation to the understanding of GBL and Minecraft, the results showed that students' lack of knowledge of Minecraft and GBL may have initially caused a steep learning curve for students. However, post gaming survey results suggested that they overcame this learning curve as the weeks progressed.

For English language learning and games, data suggested that the students in this study had, in general, a positive perception of using games for language learning. Students in the pre-gaming session survey tended to evaluate each item slightly higher than in the post-gaming session survey, which indicated over-inflated expectations for using GBL. Encouragingly, when considering the establishment of GBL in the classroom, the students still perceived it as possible, interesting, and better to learn English through games. The exception to this was learning through games being faster than traditional instruction methods, which could indicate a preference for quickly learning English, but using games for more in-depth learning and practice.

When considering GBL and the specific skills of listening, speaking, reading, and writing, the researcher found some pre-conceived misconceptions. Even though the specific requirements of the gaming sessions were explained in the pre-gaming session orientation, students brought with them misconceptions of what chatting in a game was and ignored the research information provided to them. As with the results presented earlier in this chapter, these inflated expectations were adjusted during the post-gaming session survey. The results demonstrated that students believed their reading and writing skills had improved through playing Minecraft and communicating with other NNS through the chat function in English to build a virtual university campus. The current section has aimed to provide a summary of the pre- and post-gaming sessions. The limitations of this research will be outlined below.

## **9.6 Limitations**

This study had several limitations that have been acknowledged throughout and will be summarized again here. Firstly, the sample size in this research was limited. The researcher has attempted to mitigate this limitation by using a case study methodology, allowing him to provide a detailed account of each individual participant, and to implement mixed methods to obtain a broad perspective on the data.

Secondly, a single researcher coded and analyzed the data. Throughout this study, the researcher has acknowledged that the interpretation of the data is based on his own experiences and understanding and that other interpretations exist. While the researcher has interpreted and presented the data in this way, other researchers may have had different interpretations. The final section of this chapter will outline the possible future directions

### **9.7 Future direction**

From chapter one, there have been numerous references to a hybrid classroom in this research. The following section will discuss what exactly this hybrid classroom might look like in relation to GBL and the potential benefits to students and teachers.

As outlined in chapters one and two, language education in Japan is dominated by a teacher-centered methodology and a reliance on the grammar-translation. There is also resistance to change. Moving from this way of teaching to a full GBL student-centered methodology is unlikely to occur without undisputable and quantifiable evidence for GBL's benefits compared to more traditional methods. However, the goal of this research has never been to replace the current teaching methodology. The goal is to provide an additional tool that may increase the communicative competence of Japanese English language learners.

In terms of Gartner's Hype cycle (Gartner, 2008), GBL would need to be well into the plateau of productivity for the concept to even be discussed in Japan. However, the year 2020 and the appearance of COVID-19 has shown the world the need for alternatives, especially for the delivery of education. Even Japan has been forced to embrace new teaching methods,



such as e-learning, which may provide the starting point for a more in-depth investigation into alternative methodologies, including GBL.

The researcher believes that the ideal mix of a traditional classroom with a GBL setting of the future would see the teacher introduce grammar, key phrases, and vocabulary of the day that the students need to practice. This process would be similar to the current methodology employed by foreign-language learning classrooms and would not require extra work or retraining for the teacher. After this introduction, the students would go into the game selected as appropriate for the classroom environment and complete tasks assigned by the teacher through NNS-NNS interaction using the TL. As outlined in chapter two and throughout this research, GBL's affordances include reduced anxiety and the ability for NNS-NNS interaction in the TL in which students can use ZPD to assist with learning. While students will have a chance to learn the TL outlined by the teacher, they will also be able to use other aspects of language such as humor, politeness, negotiation skills, which will assist in improving the student's communicative competence.

The teacher in the future hybrid classroom would work as a supervisor by providing in-game feedback and assistance when necessary to ensure all students can benefit from GBL and allow students to spend their time in group play. For instance, while monitoring students' chats, the teacher may come across a word or phrase misused by one or even multiple class members. The teacher would instantly address the common issue with the entire class and monitor the corrected use. The future hybrid classroom may appear an impossibility, given that the Japanese education system can be resistant to change. However, it is the responsibility of practitioners to continue to research and develop a greater understanding of the GBL field so that if and when the opportunities arise, they are taken. In this research games have proven to be fun for students and if brought into the classroom setting could demonstrate that “a motivated learner can't be stopped” (Prensky, 2001, p. 7).

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## Appendices

### Appendix One

# Language learning in the digital game Minecraft: A mixed methods study of Japanese EFL learners

## CONSENT FORM

By signing below, I confirm that I have read and understood the information package and in particular have noted that:

以下に署名することにより、私は情報パッケージを読んで理解し、具体的に次の項目に留意することを確認します：

- I understand that my involvement in this research will me to attend one 50-minute English class per week for 11 weeks.  
私は、この研究に参加することで、週 1 回 50 分の英語クラスに 11 週間参加することになると理解しています。
- I understand that I will use Minecraft during the lessons  
私はこのレッスンの中でマイクラフトを使用することを理解しています。
- I have had any questions answered to my satisfaction;  
私はどんな質問にも満足のいく回答をもらいました。
- I understand the risks involved;  
私は関連するリスクを理解しています；
- I understand that there will be no direct benefit to me for my participation in this research  
私はこの研究に参加しても直接的な利益はないことを理解しています。
- I understand that my participation in this research is voluntary  
この研究への私の参加は任意であることを理解しています。
- I understand that if I have any additional questions, I can contact the researcher  
他に質問がある場合は、研究者に連絡できることを私は理解しています。
- I understand that I am free to withdraw at any time, without comment or penalty;  
私は、批判や罰則なしにいつでも自由に撤回できることを理解しています。

**Please note:**

**This research is for the fulfillment of Jeremy's PhD research.**

ご注意ください：

この研究はジェレミーの教育学博士号研究を遂行するためのものです。

**Privacy**

The conduct of this research involves the collection, access and / or use of your identified personal information. The information collected is confidential and will not be disclosed to third parties without your consent, except to meet government, legal or other regulatory authority requirements. A de-identified copy of this data may be used for other research purposes. However, your anonymity will at all times be safeguarded.

**プライバシー**

本研究の実施には、あなたの個人情報の収集、アクセス、及び／又は使用が含まれます。収集された情報は機密情報であり、政府、法律、又はその他の規制当局の要件を満たす場合を除き、あなたの同意なしに第三者に開示されることはありません。このデータの匿名化されたコピーは、他の研究目的の為に使用される場合があります。ただし、あなたの匿名性は常に保護されます。

**Contact**

Jeremy White

whitejeremy@gmail.com

Name	
Signature	
Date	

## Appendix Two

### Week 1 Task

Here is an ariel photograph of what the university looks like. This will help you when finding the correct position to build.

*Try to use the vocabulary from your list if possible, and if there is a word you want to know please add it to the list and we can update the list week by week.*

Here is a map to help you.



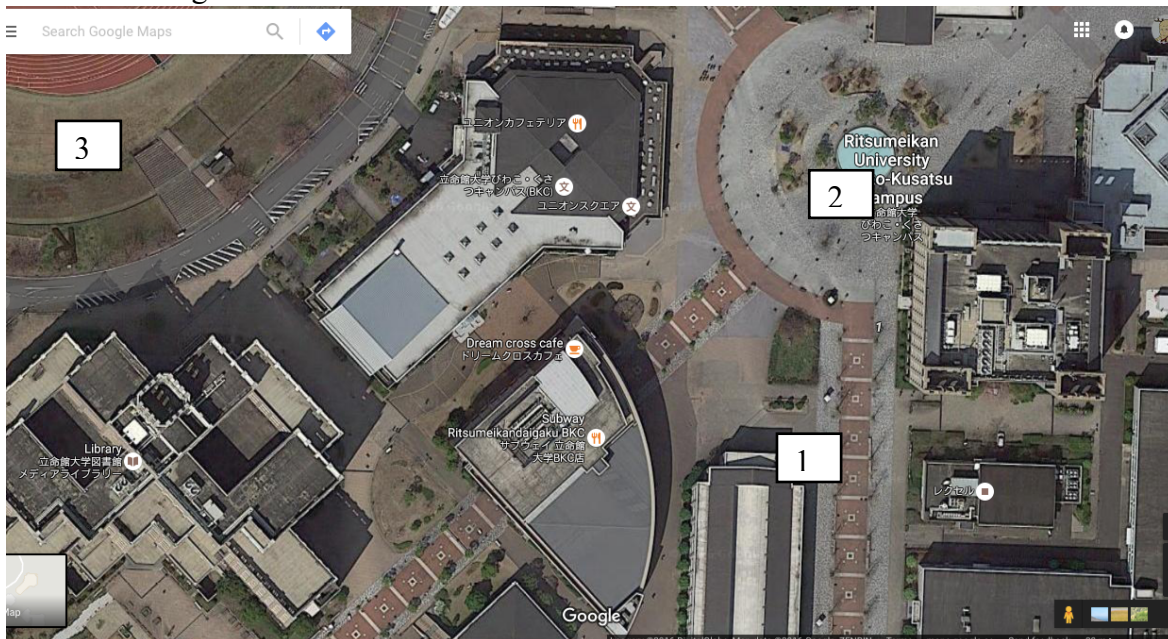
## Minecraft Week 3 Let's Build

Over the past two weeks we have had some orientation sessions on how to use Minecraft. Today we will start to build buildings in Minecraft. I have made an area for you to use.

### Make a team

Please try to stay in this area.

1. Please make a team of three people. Each team will have a different task to complete. You will need to communicate with each other via chat to be successful in your task. Please chat in English
2. You will need to make the ground level before you start. This will involve breaking blocks and adding blocks in different areas.
3. You will also need to discuss where in your area each team is going to build. This should be done in the game chat.



### Using chat

To be successful today you will need to chat to each other using the Minecraft chat. Please do not worry about your language ability, we learn through making mistakes. I will give you some feedback about your English after the lesson.

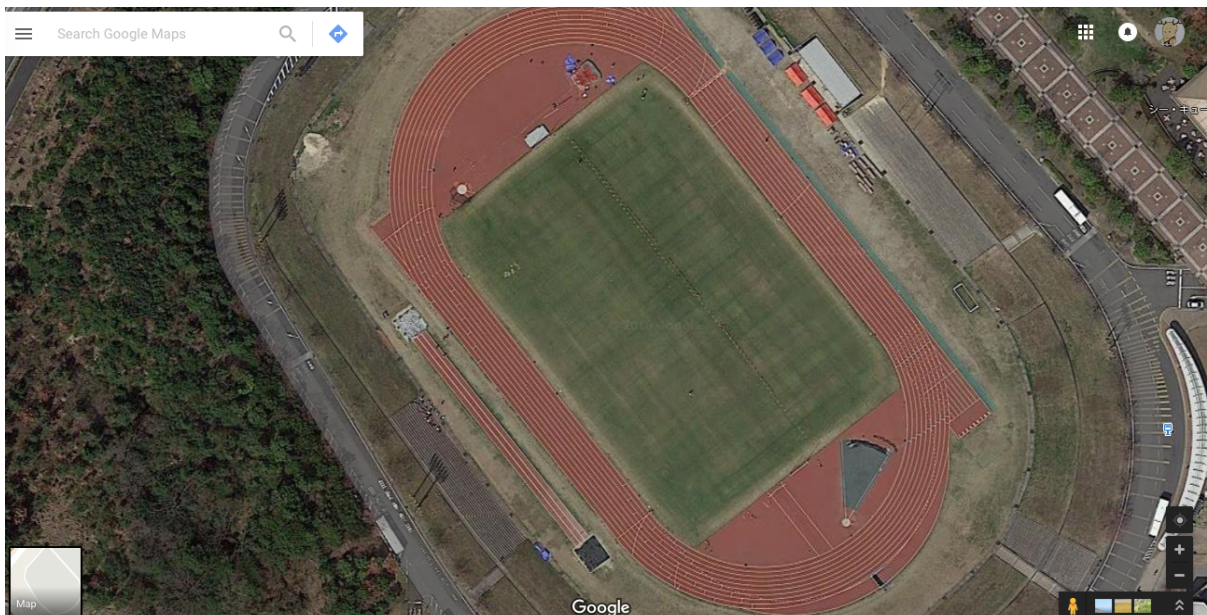
### Vocabulary

You may need to use Minecraft vocabulary for this lesson. You should be able to find most of the vocabulary you need on the list provided in the last week. If it isn't there, then please first ask another student, or your teacher.



## Group 1

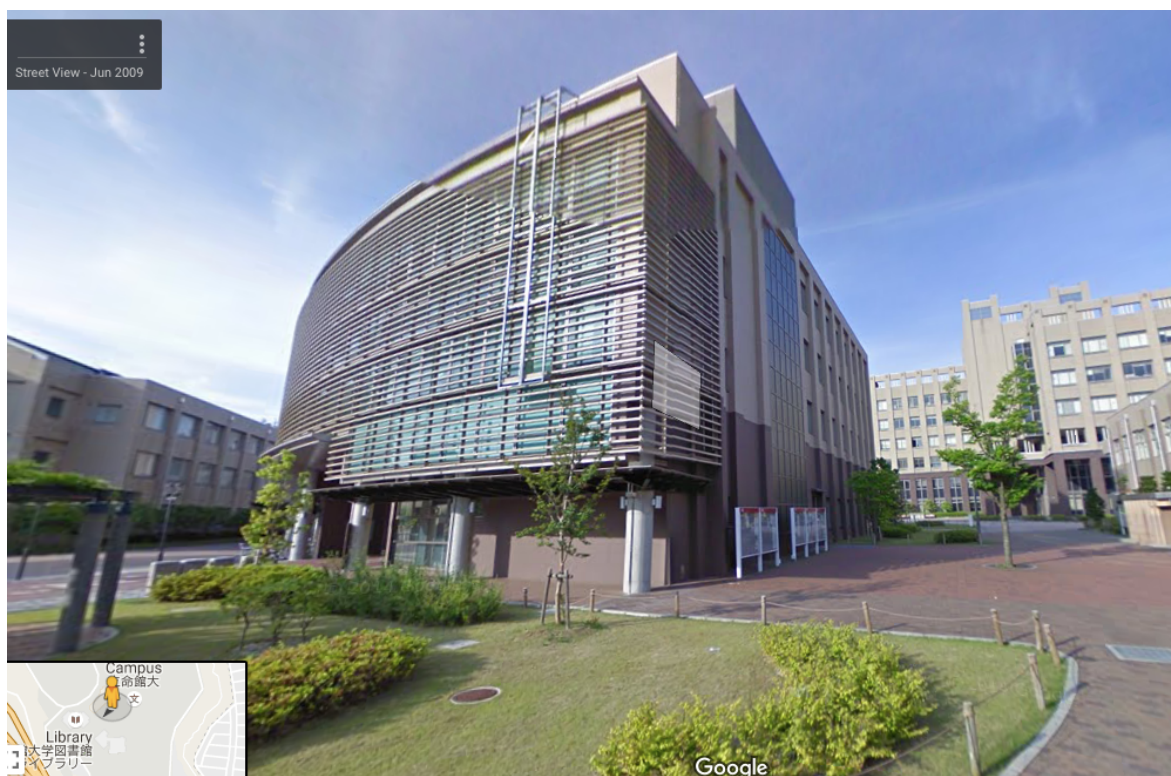
You will attempt to build the sports ground. You will need to decide how many blocks long/wide/high your sports ground should be, and what material you will use. There is no right or wrong answer!! Start by completing the track. If you have time, then you can try the inside the stadium as well.



## Group 2

You will attempt to build #1 on the map. You will need to decide how many blocks long/wide/high your building should be, and what material you will use. There is no right or wrong answer!! Start by completing the outside of the building. If you have time, then you can try the inside as well.





### Appendix Three

<b>University Vocabulary List</b>			
Below is a list of vocabulary you may need related to the university and building. This is a self-study list so please use it if you feel it is necessary. At the bottom there is an area for you to add more vocabulary			
<b>Number</b>	<b>Word (English)</b>	<b>Japanese</b>	<b>Example sentence</b>
1	3D Model		
2	Administration Office		
3	Aerial		
4	Air Conditioner		
5	Architect		
6	Athletic Track		
7	ATM		
8	Bakery		
9	Balcony		
10	Baseball Ground		
11	Basement		
12	Bicycle Racks		
13	Blinds		
14	Blueprint		
15	Book Shelf		
16	Book Shop		
17	Books		
18	Brick		
19	Bricklayer		
20	Builder		
21	Builder		
22	Bush		
23	cafeteria		
24	Car Park		
25	Carpenter		
26	Ceiling		
27	Chair		
28	Classroom		
29	Clock		
30	Coffee Shop		
31	College of Economics		
32	College of Information		

	Science and Engineering		
33	College of Life Sciences		
34	College of Pharmaceutical Science		
35	College of Science and Engineering		
36	College of Sport and Health Science		
37	Communal Area		
38	Computer		
39	Construction Site		
40	Contract		
41	Convenience Store		
42	Copy Machine		
43	Demolish		
44	Design		
45	Desk		
46	Disabled Toilet		
47	Doodle		
48	Dormitory		
49	Down Light		
50	Drainpipe		
51	Drawing		
52	East		
53	Electrician		
54	Elevator		
55	Expand		
56	Fast Food Shop		
57	Fire Escape		
58	Fire Hose		
59	First Floor		
60	Floor Socket		
61	Foundation		
62	Fountain		
63	Gate		
64	Glue		
65	Graduate School of Economics		
66	Graduate School of Information		

	Science and Engineering		
67	Graduate School of Life Sciences		
68	Graduate School of Science and Engineering		
69	Graduate School of Sport and Health Science		
70	Grass		
71	Ground Floor		
72	Gym		
73	Gymnasium		
74	Hallway		
75	Hammer		
76	Hotel		
77	Integrated Institute of Arts and Science		
78	Interior Designer		
79	Kitchen		
80	Lectern		
81	Length		
82	library		
83	Lift		
84	Light		
85	Light post		
86	Lobby		
87	Measure		
88	Mezzanine		
89	Nail		
90	North		
91	Notice Board		
92	Outside Light		
93	Over Head Projector		
94	Paint		
95	Partition Wall		
96	Photo Booth		
97	Plan		
98	Plasterer		

99	Plumber		
100	Printer		
101	Professor Office		
102	Projector		
103	Remove		
104	Replace		
105	Research Laboratory		
106	Road		
107	Roof		
108	Rubbish Bin		
109	Running Track		
110	Safety Inspector		
111	Screen		
112	Screw		
113	Second Floor		
114	Security Camera		
115	Security Guard		
116	Server Room		
117	Site Manager		
118	Sketch		
119	Skylight		
120	Smoke Alarm		
121	Smoking Area		
122	South		
123	Speaker		
124	Sports Field		
125	Sports Ground		
126	Staff Restaurant		
127	Stairs		
128	Stone		
129	Surveyor		
130	Table		
131	Teachers Lounge		
132	Tennis Court		
133	Tile		
134	Toilet		
135	Tree		
136	Umbrella Stand		
137	Vending Machine		

138	Wall		
139	Wallpaper		
140	West		
141	White Board		
142	Window		
143	Wood		
144	Word		
145	Drainpipe		
146	Stone Path		
147	Garden		
148	AED		
149	Emergency Exit		
150	Automatic Door		
151	Beam		
152	Bus Terminal		
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## Appendix Four

<b>Minecraft Vocabulary List</b>			
<p>Below is a list of vocabulary that is commonly used in Minecraft. There are also many more words which are not listed here. The point of this list is to be a self-study tool so please feel free to use this list and add to it as you think is necessary. There is space for your own examples at the bottom.</p>			
Number	Word	Japanese Translation	Example sentence
1	acacia		
2	activator		
3	allium		
4	andesite		
5	anvil		
6	apple		
7	armor		
8	arrow		
9	axe		
10	bamboo		
11	banner		
12	bark		
13	barrel		
14	bat		
15	beacon		
16	bear		
17	bed		
18	bedrock		
19	beetroot		
20	bell		
21	berries		
22	birch		
23	black		
24	blaze		
25	block		
26	blue		
27	boat		
28	bone		
29	book		
30	bookshelf		
31	boots		
32	bottle		

33	bow		
34	bowl		
35	bread		
36	breath		
37	brewing		
38	brick		
39	bricks		
40	brown		
41	bucket		
42	bush		
43	button		
44	button		
45	cactus		
46	cake		
47	campfire		
48	carpet		
49	carrot		
50	cartography		
51	cat		
52	cauldron		
53	charcoal		
54	charge		
55	chest		
56	chestplate		
57	chicken		
58	chisel		
59	chorus		
60	clay		
61	clock		
62	coal		
63	cobblestone		
64	cobweb		
65	cod		
66	comparator		
67	compass		
68	composter		
69	0		
70	conduit		
71	cookie		

72	coral		
73	cornflower		
74	cow		
75	crafting		
76	creeper		
77	crossbow		
78	crystal		
79	cube		
80	cyan		
81	daisy		
82	dandelion		
83	daylight		
84	detector		
85	diamond		
86	diorite		
87	dirt		
88	disc		
89	dispenser		
90	dolphin		
91	donkey		
92	door		
93	dropper		
94	drowned		
95	dust		
96	dye		
97	egg		
98	elytra		
99	emerald		
100	enchanting		
101	end		
102	enderdragon		
103	enderman		
104	endermite		
105	evoker		
106	experience		
107	eye		
108	farmland		
109	feather		
110	fence		

111	fern		
112	fire		
113	firework		
114	fish		
115	fishing		
116	fletching		
117	flint		
118	flower		
119	foot		
120	fox		
121	frame		
122	furnace		
123	gate		
124	ghast		
125	glass		
126	glowstone		
127	gold		
128	granite		
129	grass		
130	gravel		
131	gray		
132	green		
133	grindstone		
134	guardian		
135	gunpowder		
136	hay		
137	head		
138	heart		
139	helmet		
140	hide		
141	hoe		
142	hopper		
143	horse		
144	husk		
145	ice		
146	infested		
147	ink		
148	iron		
149	item		

150	jukebox		
151	jungle		
152	kelp		
153	ladder		
154	lamp		
155	lantern		
156	lapis		
157	lava		
158	leather		
159	leaves		
160	lectern		
161	leggings		
162	lever		
163	lilac		
164	lily		
165	lime		
166	llama		
167	log		
168	loom		
169	magenta		
170	magma		
171	map		
172	melon		
173	membrane		
174	milk		
175	minecart		
176	mooshroom		
177	mule		
178	mushroom		
179	music		
180	mutton		
181	mycelium		
182	nametag		
183	nautilus		
184	nether		
185	netherrack		
186	oak		
187	observer		
188	obsidian		

189	ocelot		
190	orange		
191	orchid		
192	ore		
193	overworld		
194	painting		
195	panda		
196	paper		
197	parrot		
198	path		
199	pattern		
200	peony		
201	phantom		
202	pickaxe		
203	pickle		
204	pie		
205	pig		
206	pigman		
207	pillager		
208	pillar		
209	pink		
210	piston		
211	planks		
212	plant		
213	plate		
214	podzol		
215	poison		
216	poppy		
217	porkchop		
218	portal		
219	pot		
220	potato		
221	powder		
222	powder		
223	pressure		
224	prismarine		
225	pufferfish		
226	pumpkin		
227	purple		

228	purpur		
229	quartz		
230	quill		
231	rabbit		
232	rail		
233	ravager		
234	red		
235	redstone		
236	repeater		
237	rocket		
238	rose		
239	saddle		
240	salmon		
241	sand		
242	sandstone		
243	sapling		
244	scaffolding		
245	seagrass		
246	seeds		
247	shard		
248	shears		
249	sheep		
250	shell		
251	shield		
252	shovel		
253	shulker		
254	sign		
255	silverfish		
256	skeleton		
257	skull		
258	slab		
259	slime		
260	slimeball		
261	smelting		
262	smithing		
263	smoker		
264	snow		
265	snowball		
266	soup		



267	spider		
268	sponge		
269	spruce		
270	squid		
271	stairs		
272	stand		
273	star		
274	steel		
275	stew		
276	stick		
277	stone		
278	stonecutter		
279	stray		
280	string		
281	sugarcane		
282	sunflower		
283	sword		
284	table		
285	terracotta		
286	tnt		
287	torch		
288	totem		
289	trader		
290	trapdoor		
291	trapped		
292	trident		
293	tripwire		
294	tropical		
295	tulip		
296	turtle		
297	undying		
298	vex		
299	villager		
300	vindicator		
301	vines		
302	wall		
303	wart		
304	water		
305	wheat		

306	white		
307	witch		
308	wither		
309	wolf		
310	wood		
311	wool		
312	yellow		
313	zombie		
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## Appendix Five

# PRE- Research QUESTIONNAIRE

This questionnaire has been designed to gather information about the participants' background, English proficiency level, and gaming experience. It also attempts to find out about the participants' interest in learning the English language and perceptions in learning English through games. All of the answers to this questionnaire and others during this course are for research purposes. All answers will be kept confidential.

このアンケートは、参加者の背景、英語能力、そしてゲーム経験に関する情報を収集するためのものです。また、参加者のゲームを通じた言語習得における認識と、英語習得への関心を調査するものです。すべての回答は研究目的のものであり機密として保持されます。

INSTRUCTION: Please answer the following questions by checking the appropriate boxes. You may provide more than one answer to certain questions.

下記の質問に記入、または該当箇所をチェック（または○）をして回答して下さい。複数チェックする回答もあります。

**\*Required**

1. Section I: Student's Background 学生の背景 : Name (In English) \*

\_\_\_\_\_

2. Section I: Student's Background 学生の背景 : Gender 性: \*

*Mark only one oval.*

Male 男

Female 女

3. Section I: Student's Background 学生の背景: Level of Education 学歴: \*

*Mark only one oval.*

Undergraduate 学部生

Master 修士

PhD 博士

4. Section I: Student's Background 学生の背景: What is your major? 専攻は何ですか? \*

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5. Section I: Student's Background 学生の背景: What grade are you in? 何年生ですか? \*

*Mark only one oval.*

- 1st  
 2nd  
 3rd  
 4th  
 5th

6. Section I: Student's Background 学生の背景: Age 年齢 \*

---

7. Section II: English Proficiency 英語能力 What is your mother tongue/first language? 母国語は何ですか? \*

*Mark only one oval.*

- Japanese 日本語  
 English 英語  
 Chinese 中国  
 Others その他

8. Do you use English at home as your main means of communication? 家で主に英語を話しますか? \*

*Mark only one oval.*

- Yes はい  
 No いいえ

9. Do you use English at home for any level of communication? 家で少しでも英語を話しますか? \*

*Mark only one oval.*

- Yes はい  
 No いいえ

10. Do you use English outside of home as your main form of communication? 外で主に英語で話しますか? \*

*Mark only one oval.*

- Yes はい  
 No いいえ

11. Do you use English outside of home for any level of communication? 外で少しでも英語で話しますか? \*

*Mark only one oval.*

- Yes はい  
 No いいえ

12. Only answer this question if you answered yes to question 10 . 質問10に「はい」と答えた方のみ回答して下さい。Where do you speak English outside of home? (Check all that apply) 外で主にどこで英語を話しますか? (当てはまるものすべてにチェックしてください)

*Tick all that apply.*

- In university 学校  
 At part-time バイト先  
 Online forum オンライン掲示板等  
 With friends  
 In the community

Other:  \_\_\_\_\_

13. Only answer this question if you answered yes to question 11. 質問11に「はい」と答えた方のみ回答して下さい。Where do you speak English outside of home? (Check all that apply) 外で少しでもどこで英語を話しますか? (当てはまるものすべてにチェックしてください)

*Tick all that apply.*

- In university 学校  
 At part-time バイト先  
 Online forum オンライン掲示板等  
 With friends  
 In the community

Other:  \_\_\_\_\_

14. Have you learned English using media (movies, music, games etc.)? メディア (映画、音楽、ゲーム等) を通じて英語を勉強したことがありますか? \*

*Mark only one oval.*

- Yes はい Proceed to Q15 問15へ  
 No いいえ Proceed to Q16 問16へ

15. If you answered yes to question 14, please choose from the list. もしあれば、下記の当てはまるものすべてにチェックしてください。

*Tick all that apply.*

- Music  
 TV  
 Games  
 Self study CD/DVD  
 Books (including comics)  
 Internet (Youtube etc)

Other:  \_\_\_\_\_

16. Have you taken a standardized English proficiency test? 英語能力試験を受けたことがありますか? \*

Mark only one oval.

- Yes はい Proceed to Q17 問17 へ  
 No いいえ Proceed to Q19 問19 へ

17. If yes, what kind of English proficiency test have you taken? (You can choose more than one) 何の英語能力試験を受けましたか? (複数回答可)

Tick all that apply.

- TOEFL iBT/PBT  
 TOEIC  
 IELTS  
 Eiken  
Other:  \_\_\_\_\_

18. What was the year of your most recent English proficiency test? 前回英語能力試験を受けたのはいつですか? (例: 2015年)

\_\_\_\_\_

19. INSTRUCTION: Please check the answer that best represent your English skill. 該当する自己評価に○をつけて下さい。How well would you rate your English skills? 自分の英語能力を評価すれば、Listening リスニング \*

Mark only one oval.

- Very Poor 良くない  
 Poor あまり良くない  
 Average 標準  
 Good やや良い  
 Very Good 良い



20. Reading 読解\*

*Mark only one oval.*

- Very Poor 良くない
- Poor あまり良くない
- Average 標準
- Good やや良い
- Very Good 良い

21. Writing ライティング\*

*Mark only one oval.*

- Very Poor 良くない
- Poor あまり良くない
- Average 標準
- Good やや良い
- Very Good 良い

22. Speaking スピーキング\*

*Mark only one oval.*

- Very Poor 良くない
- Poor あまり良くない
- Average 標準
- Good やや良い
- Very Good 良い

23. SECTION III: GAMING KNOWLEDGE & EXPERIENCE ゲームの知識&経験 For the purpose of this research a video game will be defined as any type of cellphone, console, or computer game. If you play games such as tsumu tsumu on your commute to university, this would be considered to be playing a video game. この研究では、ゲームはいかなるタイプの携帯電話、家庭用ゲーム機またはコンピューターゲームとして定義されます。もし通学中にツムツム等のゲームをしている場合は、ゲームをしていると考えられます。 1. Do you play any video games? ゲームをしますか? \*

Mark only one oval.

- Yes はい Proceed to Q24 問24へ
- No いいえ Proceed to next section (question 30) 次のセクションに進んで下さい(問30へ)

24. If yes, what kind of video games do you play? (You can choose more than one) 何のゲーム機を使いますか? (複数回答可)

Tick all that apply.

- PC games コンピューターゲーム (games played on a computer that do not require internet connection) (インターネット接続不要のコンピューター内のゲーム)
- Console games (Playstation, Xbox, Wii etc.) 家庭用ゲーム機
- Mobile phone games (iPhone, iPad, Android etc.) スマートフォン.タブレット
- Online games オンラインゲーム
- MMORPG (多人数同時接続型オンライン.ロール.プレイング.ゲーム)

Other:  \_\_\_\_\_

25. What genre of game do you play? (You can choose more than once) どんなジャンルのゲームをしますか? (複数回答可)

Tick all that apply.

- Action-Adventure アクションアドベンチャー
- Role-playing ロールプレイング
- Simulation シミュレーション
- Strategy 戦略シミュレーション

Other:  \_\_\_\_\_

26. What age did you start playing video games? (even on a non-regular basis) 何歳からゲームをしていますか? (不定期な場合も含め)

*Mark only one oval.*

- 1 - 5 years old  
 6 - 10 years old  
 11 - 15 years old  
 16 - 20 years old  
 20 years +

27. How often do you currently play video games? 現在どのぐらいの頻度でゲームしますか?

*Mark only one oval.*

- Every day 毎日  
 A few times in a week 週に数回  
 Once a week 週に一回  
 A few times in a month 一ヶ月に数回  
 Once a month 一ヶ月に一回

28. How long do you spend playing video games each session?  
その時には何時間ゲームをしますか?

*Mark only one oval.*

- Over 30 minutes 30分以上  
 21 - 30 minutes 21~30分  
 11 - 20 minutes 11~20分  
 Less than 10 minutes 10分

29. How long do you spend playing video games a week?  
週何時間ビデオゲームをしますか?

*Mark only one oval.*

- 3 - 4 hours 3~4時間  
 2 to 3 hours 2~3時間  
 1 to 2 hours 1~2時間  
 Less than 1 hour 1時間以内  
 4 - 5 hours 4~5時間  
 Over 5 hours 5時間以上

30. SECTION IV: PERCEPTIONS IN LEARNING ENGLISH THROUGH GAMES

ゲームを通した言語習得の認識 INSTRUCTION: Please

circle the answer that best represent your opinion. 最適

なものに○をつけて下さい。

1. It is possible to learn English

through playing games in English. 私は英語でゲームを通じて英語習得することは可能だと思います。\*

*Mark only one oval.*

- Strongly agree そう思う  
 Agree やや思う  
 Neither どちらとも言えない  
 Disagree あまり思わない  
 Strongly disagree 思わない

31. It will be interesting to learn English through games.

私は英語でゲームを通じて英語習

得することが楽しいと思います。\*

*Mark only one oval.*

- Strongly agree そう思う
- Agree やや思う
- Neither どちらとも言えない
- Disagree あまり思わない
- Strongly disagree 思わない

32. I learn English better through games.  
勉強しやすいと思います。\*

私は英語でゲームを通じて英語を

*Mark only one oval.*

- Strongly agree そう思う
- Agree やや思う
- Neither どちらとも言えない
- Disagree あまり思わない
- Strongly disagree 思わない

33. I learn English faster through games.  
語習得速度が早いと思います。\*

私は英語でゲームを通した方が英

*Mark only one oval.*

- Strongly agree そう思う
- Agree やや思う
- Neither どちらとも言えない
- Disagree あまり思わない
- Strongly disagree 思わない

34. My English LISTENING skill will improve after playing games in English. 私は英語でゲームを通して、英語のリスニング能力は上達できると思います。 \*

Mark only one oval.

- Strongly agree そう思う
- Agree やや思う
- Neither どちらとも言えない
- Disagree あまり思わない
- Strongly disagree 思わない

35. My English READING skill will improve after playing games. 私は英語でゲームを通して、英語の読解能力は上達できると思います。 \*

Mark only one oval.

- Strongly agree そう思う
- Agree やや思う
- Neither どちらとも言えない
- Disagree あまり思わない
- Strongly disagree 思わない

36. My English WRITING skill will improve after playing games. 私は英語でゲームを通して、英語のライティング能力は上達できると思います。 \*

Mark only one oval.

- Strongly agree そう思う
- Agree やや思う
- Neither どちらとも言えない
- Disagree あまり思わない
- Strongly disagree 思わない

37. My English SPEAKING skill will improve after playing games. 私は英語でゲームを通して、英語のスピーキング能力は上達できると思います。 \*

Mark only one oval.

- Strongly agree そう思う  
 Agree やや思う  
 Neither どちらとも言えない  
 Disagree あまり思わない  
 Strongly disagree 思わない

38. I will be more interested and motivated to learn English through games. 私は英語でゲームを通じて英語の学習意欲が上がると思います。 \*

Mark only one oval.

- Strongly agree そう思う  
 Agree やや思う  
 Neither どちらとも言えない  
 Disagree あまり思わない  
 Strongly disagree 思わない

39. I will be able to improve my standard of English through games. 私は英語でゲームを通じて自分の英語能力を上達させられると思います。 \*

Mark only one oval.

- Strongly agree そう思う  
 Agree やや思う  
 Neither どちらとも言えない  
 Disagree あまり思わない  
 Strongly disagree 思わない

## Appendix Six

### Play Coding Form

<b>Play coding</b> Lesson ____ Date _____ Time _____ Game _____ Student Name _____		
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Time (mins)	Type(s) of play observed	Notes
0 - 5		
6 -10		
11 -15		
16 - 20		
21 - 25		
26 – 30		
31 -35		
36 – 40		
41 – 45		
46 - 50		

### Comments

### Play

<b>Social Play</b> Solitary play: (SP) Parallel play: (PP) Group play: (GP) Exploratory: (E)	<b>Cognitive Play</b> Functional play: (FP) Constructive play: (CP) Dramatic play: (DP) Games with rules: (GR)	<b>Non-Play Behavior</b> Reading: (R) Unoccupied behavior: (UB) Onlooker behavior: (OB) Transition: (T) Active conversation: (AC) Aggression: (A) Rough and Tumble: (RT)
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## Appendix Seven

### Conversation Data Group 1

#### Week 1

- 
1. Student 2(F) Where are you?
  2. Student 3(M) I don't know.
  3. Student 5(F) I am also looking for you.
  4. Student 3(M) I am near water.
  5. Student 5(F) I put on a purple shirt.
  6. Student 2(F) I lost the way...
  7. Student 5(F) Where should we build?
  8. Student 2(F) I think I'm in the forest
  9. Student 5(F) Me, too.
  10. Student 2(F) Hmm
  11. Student 3(M) Here
  12. Student 2(F) How can I fry??
  13. Student 5(F) I don't know.
  14. Student 5(F) sorry
  15. Student 5(F) I can't find anyone.
  16. Student 2(F) Me too..
  17. Teacher I have teleported you to my location!!
  18. Student 2(F) Thank you !
  19. Student 5(F) Thank you!!
  20. Student 3(M) Thanks
  21. Student 2(F) I could fry!
  22. Student 2(F) But now I can't find the way to go back
  23. Student 2(F) Please wait..
  24. Teacher To stop flying (shift+space)
  25. Student 5(F) My PC stopped workng!
  26. Student 3(M) Why?
  27. Student 2(F) Thank you ! I did it!
  28. Student 2(F) You left the game?
  29. Student 5(F) I don't know.
  30. Student 5(F) I restarted !
  31. Student 2(F) Okey !
  32. Student 5(F) Sorry. I lost you again.
  33. Student 2(F) I try to find you
  34. Student 2(F) Where are you?
  35. Student 3(M) I am near water again
  36. Student 2(F) And where should we build?
  37. Student 5(F) Maybe I am in the higher place.
  38. Student 2(F) Higher place ...
  39. Student 5(F) Are you flying?
  40. Student 2(F) Yes!
  41. Student 5(F) Maybe I can find!
  42. Student 2(F) Really!
  43. Student 2(F) Can you fry?
  44. Student 3(M) fly?

45. Student 2(F) Fly...I mistake.
  46. Student 5(F) No
  47. Student 5(F) Please tell me.
  48. Student 2(F) Oh sorry
  49. Student 2(F) Press the space button
  50. Student 2(F) Many times
  51. Student 2(F) What is you x number?
  52. Student 5(F) Thanks!
  53. Student 5(F) -132
  54. Student 3(M) -230
  55. Student 5(F) How about you ?
  56. Student 2(F) 718
  57. Student 2(F) I'm 500 now
  58. Student 5(F) -60 now.
  59. Student 2(F) Okey
  60. Student 5(F) I'm in 500.
  61. Student 2(F) 0 now but I can't see anything
  62. Student 5(F) What is your y number?
  63. Student 2(F) X 57 Y 100 Z -741
  64. Student 3(M) I see you
  65. Student 5(F) Okay
  66. Student 2(F) I can see only island
  67. Student 2(F) And you?
  68. Student 5(F) X198 Y106 Z-22
  69. Student 2(F) Ok..
- 

## Week 2

---

1. Student 3(M) Hello
2. Student 5(F) Hi
3. Student 3(M) Where is Student 2?
4. Student 2(F) Here in the open space
5. Student 2(F) What is the task?
6. Student 5(F) The ground.
7. Student 3(M) Oh, looks hard.
8. Student 2(F) How do we get material
9. Student 5(F) Teacher said to ask
10. Student 3(M) What color do we use
11. Student 5(F) Red for the track
12. Student 2(F) Seats are gray
13. Student 3(M) Green Grass
14. Student 2(F) Its already green haha
15. Teacher I have given you materials for today
16. Student 2(F) Thank you teacher
17. Student 5(F) Thank you very much
18. Student 3(M) Thanks
19. Student 2(F) How to build
20. Student 5(F) It's a field.
21. Student 5(F) Maybe a circle
22. Student 2(F) ok

23. Student 2(F) How do I put blocks?
  24. Student 3(M) Mouse click
  25. Student 3(M) How big?
  26. Student 3(M) I'm making outside with brick
  27. Student 2(F) I will use yellow
  28. Student 2(F) sandstone
  29. Student 5(F) Looks good.
  30. Student 3(M) Colorful haha
  31. Student 3(M) We have three tracks. How many more?
  32. Student 5(F) Maybe 3
  33. Student 2(F) OK
  34. Student 2(F) Same pattern?
  35. Student 3(M) Brick
  36. Student 2(F) Brick yes
  37. Student 5(F) I put flowers in
  38. Student 2(F) On the track?
  39. Student 5(F) No. The field
  40. Student 3(M) Why?
  41. Student 5(F) Very pretty
  42. Student 2(F) Class is finishing soon
  43. Student 3(M) Can't finish
  44. Student 5(F) We need to finish today?
  45. Student 2(F) No
  46. Student 5(F) ok
  47. Student 2(F) I think we play next week
  48. Student 3(M) Yes. We play again next week
  49. Student 2(F) How do I save
  50. Student 5(F) I don't know
  51. Student 3(M) It's automatic
- 

### Week 3

---

1. Student 3(M) Hello
2. Student 3(M) Teacher said today we need to finish making the ground
3. Student 2(F) ok
4. Student 5(F) ok
5. Student 5(F) Look the flowers.
6. Student 2(F) Pretty.
7. Student 2(F) I will make the track
8. Student 3(M) ok. Look at the picture. We need to make seating area.
9. Student 5(F) Gray color. What material should we use?
10. Student 3(M) Same as track or different?
11. Student 5(F) Maybe different is better. I will check.
12. Student 5(F) There are gray stairs.
13. Student 5(F) Teacher please give us gray stairs
14. Teacher Here you go
15. Student 5(F) Thanks
16. Student 3(M) Thank you

17. Student 3(M) How many do we need?
  18. Student 5(F) Teacher gave us
  19. Student 3(M) I mean how many stairs
  20. Student 5(F) Sorry
  21. Student 5(F) As long as the track?
  22. Student 3(M) Like a stadium
  23. Student 5(F) No. Look at the picture. The stairs are only left side.
  24. Student 3(M) Ok.
  25. Student 5(F) How high
  26. Student 3(M) I cant see in the picture... Maybe five.
  27. Student 5(F) Ok. Let's do 5!!
  28. Student 5(F) How do I put the second stair?
  29. Student 3 (M) Second floor?
  30. Student 5 (F) Yes. Second floor.
  31. Student 3 (M) You need a block underneath. Anything is ok even dirty.
  32. Student 3 (M) Watch me
  33. Student 5 (F) Thanks
  34. Student 2(F) The track is ok. I will help you ☺
  35. Student 3(M) Thanks
  36. Student 5(F) Please make third floor
  37. Student 2(F) ok. Level 3?
  38. Student 5(F) Level or floor? Which is correct English?
  39. Student 2 (F) Level I think. Floor is for buildings I think.
  40. Student 3(M) Oh. Thank you teacher.... Haha...
  41. Student 5 (F) Student 2 teacher thanks you
  42. Student 2(F) How to put stairs down? Mine is wrong way.
  43. Student 5(F) You need a block underneath. Next stand in front and put
  44. Student 2(F) Thank you
  45. Student 3(M) 1 level is finished. I will construct 4 level
  46. Student 5(F) I finish level 2. We need 5?
  47. Student 3(M) Yes
  48. Student 5(F) Ok. I will do it
  49. Student 2(F) I am free. Can I help you?
  50. Student 3(M) I am almost finished
  51. Student 5(F) PLeae help.
  52. Student 2(F) Ok
- 

#### Week 4

- 
1. Student 2(F) Hello
  2. Student 3(M) Hi
  3. Student 5(F) Hello
  4. Student 2(F) Look at the task today. Very difficult
  5. Student 5(F) I think so.
  6. Student 3(M) Very big building. How many floors?
  7. Student 2(F) Eight!!
  8. Student 5(F) Eight!!! To many!!!
  9. Student 3(M) But a little easy I think.
  10. Student 2(F) Really??

11. Student 3(M) In the picture the building is square. The other group has a round building
  12. Student 5(F) oh, we are lucky!! haha
  13. Student 2(F) Gray color again
  14. Student 5(F) Not very interesting
  15. Student 2(F) What material do you want to use for construction?
  16. Student 5(F) Gray brick. Same as the track.
  17. Student 3(M) How big should it be?
  18. Student 2(F) 10
  19. Student 5(F) 10 long
  20. Student 3(M) Maybe 10 is too short. Look the buiding has many windows too.
  21. Student 5(F) You are right
  22. Student 2(F) 20
  23. Student 3(M) I think 20 is enough
  24. Student 5(F) 20 is ok.
  25. Student 5(F) Let's make one level
  26. Student 2(F) ok
  27. Student 3(M) Ok
  28. Student 2(F) Is that 20?
  29. Student 5(F) Maybe haha
  30. Student 3(M) I think so. But I think it is enough
  31. Student 2(F) Maybe enough
  32. Student 5(F) Ok, level 2
  33. Student 2(F) This will take a long time
  34. Student 3(M) If you fly it is easier to build quickly
  35. Student 2(F) I will try
  36. Student 5(F) Class will finish soon
  37. Student 3(M) We still have many things to do. Is this level 4 or 5?
  38. Student 2(F) Level 5
  39. Student 5(F) Do we do this next time?
  40. Student 2(F) I think so. We need more time
  41. Student 5(F) I agree. We don't have any windows yet
  42. Student 3(M) Today was just making the outside. Next time we can do that.
- 

## Week 5

1. Student 5(F) Hello
2. Student 2(F) Hi
3. Student 3(M) Hi
4. Student 5(F) We need to finish the big building.
5. Student 3(M) Ok. I can put more levels on.
6. Student 5(F) We can put windows in
7. Student 2(F) What should we use for windows??
8. Student 5(F) I don't know. I will look at our resources.
9. Student 2(F) There is grass!!
10. Student 5(F) Grass?
11. Student 2(F) Yes. It is very good for window
12. Student 5(F) Grass is green...
13. Student 2(F) Glass... haha... Sorry its mistake!!
14. Student 5(F) haha

15. Student 5(F) Now I understand
  16. Student 2(F) Teacher. Can we have glass please
  17. Teacher Here you go
  18. Student 2(F) Thank you
  19. Student 5(F) Thank you
  20. Student 2(F) Look at the picture. We need 3 windows.
  21. Student 5(F) Yes. 3 on each level
  22. Student 2(F) Many windows
  23. Student 5(F) This building is sooooo big
  24. Student 2(F) haha... Each window how many glass??
  25. Student 5(F) How many blocks?
  26. Student 2(F) Yes...How many blocks of glass?
  27. Student 5(F) I'll try.
  28. Student 5(F) This is 2 but small.
  29. Student 5(F) Maybe 4??
  30. Student 2(F) Yes. Lets do 4.
  31. Student 2(F) So 2 up and 2 across.
  32. Student 5(F) Yes I think its good.
  33. Student 2(F) 1 block gap? I mean...window gap window gap window
  34. Student 5(F) ok
  35. Student 2(F) Ill do level 1
  36. Student 5(F) I'll do level 2
  37. Student 2(F) thanks
  38. Student 3(M) I'm finished. Do you need help?
  39. Student 2(F) We are making windows
  40. Student 3(M) Ok. I can make the door. Like the picture
  41. Student 2(F) Thanks
  42. Student 5(F) Thanks
  43. Student 3(M) Teacher can I have Glass door please
  44. Teacher Sure. Here you are.
  45. Student 3(M) Thank you.
  46. Student 3(M) In the picture the door is in the middle.
  47. Student 3(M) But we have no room. There is a window in the middle.
  48. Student 2(F) Oh nooo
  49. Student 5(F) ahhhhh
  50. Student 2(F) Ok change.
  51. Student 3(M) Where?
  52. Student 2(F) Here
  53. Student 5(F) oh no. The class is finished today.
  54. Student 3(M) It's ok. We can finish next time
  55. Student 2(F) Sorry for my mistake.
  56. Student 5(F) It's my mistake. Sorry
- 

## Week 6

1. Student 2(F) Hello
2. Student 3(M) Hi
3. Student 5(F) Hello
4. Student 3(M) Let's get started
5. Student 2(F) I remember!! The window problem

6. Student 5(F) How about window gap door gap window
  7. Student 2(F) Last time we said 2 up and 2 across for the window.
  8. Student 5(F) yes....
  9. Student 3(M) The door is maybe 2 up 1 across
  10. Student 2(F) ok...I think we need to move the window
  11. Student 3(M) Sorry
  12. Student 5(F) So now window gap window gap door gap window
  13. Student 3(M) I think it is better. Maybe just move the right window.
  14. Student 2(F) I will try
  15. Student 3(M) Ok now I will add the door.
  16. Student 5(F) Looks good.
  17. Student 2(F) Do we need to move the window on other levels?
  18. Student 3(M) Look at the pictue. All the windows are same place.
  19. Student 5(F) I think it looks better. Lets move the right one
  20. Student 2(F) ok.
  21. Student 3(M) I don't have any glass. Can you give me some?
  22. Student 2(F) How do I give you some?
  23. Student 3(M) Long right click
  24. Student 2(F) Ok.
  25. Student 3(M) Thanks
  26. Student 2(F) Now I don't have any glass
  27. Student 3(M) haha...Sorry I will give it back.
  28. Student 2(F) It's ok. I will ask the teacher.
  29. Student 2(F) Teacher can I have glass
  30. Teacher Here you are. I have given glass to all of you.
  31. Student 2(F) Thank you!!
  32. Student 5(F) Thank you
  33. Student 3(M) Thanks
  34. Student 5(F) I don't thik we can finish it all
  35. Student 2(F) Maybe
  36. Student 3(M) Next week is the last week. We still have time.
  37. Student 2(F) Does each side need a door?
  38. Student 5(F) I don't think so
  39. Student 3(M) Maybe one door is enough
  40. Student 2(F) OK
  41. Student 5(F) Ahh, time is up again
  42. Student 3(M) Its ok. We still have next week.
  43. Student 2(F) I hope we can finish our construction
  44. Student 5(F) Bye
  45. Student 2(F) see you
  46. Student 3(M) Goodbye
- 

## Week 7

- 
1. Student 5(F) Hello.
  2. Student 3(M) Hi.
  3. Student 2(F) Hello!!
  4. Student 3(F) Today is the last day!!!
  5. Student 2(F) Lets finish this building
  6. Student 3(M) Yes we must finish

7. Student 5(F) Ok let's go.
  8. Student 2(F) What about inside?
  9. Student 3(M) I don't think we have time
  10. Student 5(F) Maybe we should make a path like the picture.
  11. Student 2(F) Ok. In red?
  12. Student 5(F) Yes
  13. Student 2(F) Teacher can we have red brick please
  14. Teacher Here you are
  15. Student 2(F) Thank you
  16. Student 2(F) Ok, I have started a path like this. When you finish please help me
  17. Student 5(F) I'm finished. How long is the path?
  18. Student 2(F) I think we can join the other group
  19. Student 5(F) ok
  20. Student 3(M) I will help too
  21. Student 3(M) Teacher more red brick please
  22. Student 5(F) 10 more minutes!!!
  23. Student 3(M) ah!!!!
  24. Student 2(F) Quickly....
  25. Student 5(F) OK, I think that's enough
  26. Student 2(F) Just in time
  27. Student 3(M) Good job. I think our field and building look good.
  28. Student 2(F) It was very hard. And stress!!
  29. Student 5(F) Very stress
  30. Student 3(M) Ok, see you.
  31. Student 2(F) Bye. Thank you
  32. Student 5(F) See you.
  33. Student 5(F) Thank you
-



## Conversation Data Group 2

### Week 1

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1. Student 4(M) where should we go?
2. Student 6 (M) Teacher didn't say
3. Student 1 (M) maybe, anywhere...?
4. Student 4(M) lets explore!
5. Student 6 (M) yes
6. Student 4(M) Would you follow me?
7. Student 1 (M) OK!
8. Student 6 (M) OK
9. Student 4(M) lets climb!
10. Student 4(M) im making stair
11. Student 4(M) found openly field!
12. Student 1 (M) what should we do?
13. Student 4(M) maybe create something
14. Student 6 (M) Create what?
15. Student 4(M) sorry lost you
16. Student 1 (M) me, too...
17. Student 4(M) dark...
18. Student 6 (M) We need light
19. Student 4(M) ill make landmark
20. Student 4(M) i made high tower
21. Student 6 (M) very high
22. Student 4(M) are you in wood?
23. Student 4(M) youre flying and in trouble ?
24. Student 1 (M) maybe...
25. Student 4(M) i see
26. Student 4(M) because of computers slow response. stop flying is difficult
27. Student 1 (M) i just go back to the ground!
28. Teacher To stop flying (shift+space)
29. Student 4(M) great!
30. Student 6 (M) thank you
31. Student 4(M) thanks!!
32. Student 1 (M) thanks a lot!
33. Student 4(M) find each other
34. Student 1 (M) ok
35. Student 1 (M) i'm on the top of the white towers
36. Student 4(M) ok!
37. Student 6 (M) Me too
38. Student 4(M) the tower is made by you?
39. Student 1 (M) no ,
40. Student 6 (M) Yes
41. Student 4(M) ok
42. Student 4(M) snow?
43. Student 1 (M) maybe snow
44. Student 4(M) ㄹ k
45. Student 4(M) this world is so wide unlimited
46. Student 6 (M) unlimited? What mean?

47. Student 1 (M) No finish
  48. Student 6 (M) ok
  49. Student 1 (M) where are you??
  50. Student 4(M) so, maybe you are sooooo far from me
  51. Student 4(M) im lflying
  52. Student 1 (M) can you see the mountain covered with snow?
  53. Student 4(M) you!
  54. Student 1 (M) yeah!
  55. Student 4(M) great so go to plain building
  56. Student 4(M) Please follow me
  57. Student 1 (M) ok! let's go
  58. Student 4(M) flying
  59. Student 4(M) up is space key long
  60. Student 1 (M) thanks!
  61. Student 4(M) here is plain so down
  62. Student 4(M) todays task is building
  63. Student 6 (M) May difficult
  64. Student 1 (M) yes, so where do we have tn put blocks first?
  65. Student 4(M) ummmm..
  66. Student 4(M) anyway gather the material
  67. Student 4(M) by pickaxe teacher gave us
  68. Student 6 (M) Thank you
  69. Student 4(M) I hold now
  70. Student 4(M) ok!
  71. Student 1 (M) let's go!
  72. Student 4(M) lets gather 64 blocks
  73. Student 1 (M) me, too!
  74. Student 4(M) ok!
  75. Student 4(M) the building we must do is sooooooo difficult!
  76. Student 6 (M) Do we finish today?
  77. Student 4(M) round..
  78. Student 1 (M) yes...
  79. Teacher Do you want some materials?
  80. Student 4(M) first make here more plain
  81. Student 1 (M) ok!
  82. Student 6 (M) flat?
  83. Student 4(M) our building is triangle
- 

## Week 2

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1. Student 4(M) lets make building!
2. Student 1 (M) ok!
3. Student 6 (M) ok
4. Student 4(M) decide how large
5. Student 4(M) our building is
6. Student 6 (M) looks so big
7. Student 4(M) triangle so,
8. Student 6 (M) triangle
9. Student 4(M) first make three point
10. Student 1 (M) may I connect those blocks?

11. Student 4(M) of course thanks but its not precise sorry about
  12. Student 1 (M) ok!
  13. Student 4(M) this line is difficult..
  14. Student 6 (M) I agree
  15. Student 1 (M) how about three or four blocks on the same lines?
  16. Student 4(M) good !
  17. Student 4(M) now looking from high not bad!
  18. Student 6 (M) how to fly?
  19. Student 1 (M) long space key
  20. Student 6 (M) thanks
  21. Student 4(M) Could you connect ? I make wall there
  22. Student 1 (M) thanks! maybe, finished
  23. Student 4(M) the pole is brick and wall is stone it more beautiful
  24. Student 4(M) and we make gate like a picture
  25. Student 6 (M) how do we make a gate?
  26. Student 4(M) Im gathering materials
  27. Student 4(M) where should we make windows....?
  28. Student 4(M) ummm
  29. Student 1 (M) we need windows on every side ..?
  30. Student 4(M) it feel openly! nice but anyway like picture, curved line is made by glass
  31. Student 4(M) windows
  32. Student 1 (M) so... how about the first layer is brick and second layer is windows and third layer is bricks... and so on
  33. Student 4(M) wow! agree with you!
  34. Student 4(M) be careful!
  35. Student 1 (M) thanks!
  36. Student 6 (M) class is finishing now
  37. Student 1 (M) do we finish this today?
  38. Student 4 (M) Teacher said next week.
- 

### Week 3

- 
1. Student 4(M) once set the glass, we cannot remove it. it is break
  2. Student 6 (M) oh
  3. Student 1 (M) really?! I didn't know it
  4. Student 4(M) cannot reuse...Please put carefully
  5. Student 6 (M) ok I be careful
  6. Student 1 (M) i notice we don't have so many bricks so I think we should use another material
  7. Student 6 (M) lets us the teacher
  8. Student 4(M) hey! dear teacher gave us bricks!
  9. Student 6 (M) he gave us many bricks
  10. Student 1 (M) thank you so much...!
  11. Teacher You are welcome
  12. Student 1 (M) and how about make entrance here?
  13. Student 6 (M) ok
  14. Student 6 (M) with brick?

15. Student 1 (M) yes
  16. Student 4(M) ok ! nice
  17. Student 4(M) wow great!
  18. Student 6 (M) inside is dark
  19. Student 6 (M) we need light
  20. Student 1 (M) We can make a light
  21. Student 4 (M) Ask teacher
  22. Student 6 (M) teacher please give light to us
  23. Teacher I have given you torches
  24. Student 6 (M) torches
  25. Student 4(M) light up!!
  26. Student 1 (M) cool!
  27. Student 1 (M) nice entrance!
  28. Student 4(M) thanks!
- 

#### Week 4

---

1. Student 4(M) lets continue!
2. Student 1 (M) yes!
3. Student 6 (M) ok
4. Student 6 (M) do we need to finish today?
5. Student 1 (M) all construction?
6. Student 6 (M) Yes
7. Student 1 (M) No. Teacher said to continue with this building
8. Student 6 (M) ok. Thanks.
9. Student 4(M) I decided the height this line is the ceiling
10. Student 6 (M) Ok. The ceiling is same brick color?
11. Student 4 (M) Yes. I think its good.
12. Student 6 (M) OK.
13. Student 1 (M) may i break this point and make an another entrance?
14. Student 6 (M) like the picture?
15. Student 1 (M) Yes. Thanks.
16. Student 4(M) ok, of course thanks
17. Student 4(M) ill gathering material
18. Student 1 (M) ok! ill change some details
19. Teacher How's it going? Do you need any materials?
20. Student 4(M) ummm more glass or bricks
21. Student 1 (M) me, too please
22. Student 4(M) thank you so much
23. Student 1 (M) thank you!
24. Student 4(M) Student 1 ill give you bricks
25. Student 4 (M) Please use it
26. Student 4(M) Please in front of me
27. Student 4(M) im down of you
28. Student 1 (M) thank you very much!
29. Student 4(M) welcome!
30. Student 4(M) oh rain..
31. Student 1 (M) oh no...
32. Student 4(M) our building is not bat! i want to visit such building!
33. Student 1 (M) bat?

34. Student 4 (M) bad...sorry
  35. Student 1 (M) I think so, too!
- 

## Week 5

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1. Student 4 (M) lets continue and make the roof!
  2. Student 1 (M) Ok! let's go!
  3. Student 6 (M) Still much to do
  4. Student 1 (M) Soooo much
  5. Student 6 (M) Lets finish the roof.
  6. Student 1 (M) What to construct next?
  7. Student 4 (M) Look at the picture
  8. Student 4 (M) We need outside design
  9. Student 6 (M) We need some different color blocks
  10. Student 6 (M) Maybe red, blue, gray, black and green
  11. Student 1 (M) Teacher can we have red, blue, gray, black and green bricks
  12. Teacher Here you go
  13. Student 6 (M) Thanks
  14. Student 4 (M) I'll make the road from the entrance
  15. Student 4(M) Student 1, thank you for mailing outside and its so nice
  16. Student 1 (M) very nice entrance! thank you!
  17. Teacher It's very quiet today. Is everything ok?
  18. Student 4(M) we are soo concentrating sorry
  19. Teacher No problem. Just checking you are ok
  20. Student 1 (M) we will continue next week
- 

## Week 6

---

1. Student 1 (M) Can we finish today?
  2. Student 4 (M) Ummm, maybe.
  3. Student 1 (M) Let's continue with outside construction
  4. Student 4 (M) OK
  5. Student 6 (M) sorry the tree I have set is soooo big
  6. Student 1 (M) Wow. Very big
  7. Student 6 (M) I never expected it grows such size
  8. Student 6 (M) so,
  9. Student 6 (M) I will cut
  10. Student 1 (M) ok! i have made some details. and i seek place where i can change next...
  11. Student 4(M) ok thanks!
  12. Student 4(M) Im making the terrace
  13. Student 4(M) but
  14. Student 4(M) it is impossible to represent table and chair
  15. Student 1 (M) I think we can change the ground color but those items are difficult
  16. Student 4(M) umm surely and its too wide..
  17. Student 4(M) difficult...
  18. Student 6 (M) Time is finished already
  19. Student 1(M) We can finish next week
-

## Week 7

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1. Student 4 (M) Last day
  2. Student 4 (M) we have to finish today.
  3. Student 1 (M) look at the picture
  4. Student 1 (M) I think we are almost complete
  5. Student 6 (M) I'm building a road
  6. Student 1 (M) To the other buildigs?
  7. Student 6 (M) Yes
  8. Student 6 (M) Please help me
  9. Student 1 (M) ok! Gray color?
  10. Student 6 (M) Yes do you have gray blocks?
  11. Student 1(M) Not enough
  12. Student 4(M) Ask the teacher
  13. Student 6(M) Teacher can I have gray blocks for my road
  14. Teacher Here you are
  15. Student 6(M) Thanks
  16. Student 4(M) I think we are finished
  17. Student 1 (M) me too
  18. Student 6 (M) Yes yes
  19. Student 4(M) It looks very good
  20. Student 6 (M) I think so too
  21. Student 1(M) me too
-

## Appendix Eight

### Gaming class reflection week

Thank you for participating in this research. I hope you enjoyed making a Minecraft university campus. As this is the last week I would like to do a survey.

This survey is to get a better understanding of how you felt about the gaming sessions in Minecraft. Please feel free to answer the questions with as much detail as you want to and please be honest.

Again, I would like to thank you very much for participating and I hope you got something out of this research.

\*Required

1. Name \*

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2. 1. What was your knowledge of game-based learning before this class? Has your understanding of game-based learning change? \*

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3. 2. What was your knowledge of Minecraft before this class? \*

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PERCEPTIONS IN LEARNING ENGLISH THROUGH GAMES ゲームを通じた言語習得の認識

INSTRUCTION: Please circle the answer that best represents your opinion.

最適なものに

○をつけて下さい。

4. 3. It is possible to learn English through playing games in English. 私は英語でゲームを通じて英語習得することは可能だと思います。 \*

Mark only one oval.

- Strongly agree そう思う
- Agree やや思う
- Neither どちらとも言えない
- Disagree あまり思わない
- Strongly disagree 思わない

5. 4. It will be interesting to learn English through games. 私は英語でゲームを通じて英語習得することが楽しいと思います。 \*

Mark only one oval.

- Strongly agree そう思う
- Agree やや思う
- Neither どちらとも言えない
- Disagree あまり思わない
- Strongly disagree 思わない

6. 5. I learn English better through games. 私は英語でゲームを通じて英語を勉強しやすいと思います。 \*

Mark only one oval.

- Strongly agree そう思う
- Agree やや思う
- Neither どちらとも言えない
- Disagree あまり思わない
- Strongly disagree 思わない



7. 6. I learn English faster through games. 私は英語でゲームを通した方が英語習得速度が早いと思います。 \*

Mark only one oval.

- Strongly agree そう思う
- Agree やや思う
- Neither どちらとも言えない
- Disagree あまり思わない
- Strongly disagree 思わない

8. 7. My English LISTENING skill will improve after playing games in English. 私は英語でゲームを通して、英語のリスニング能力は上達できると思います。 \*

Mark only one oval.

- Strongly agree そう思う
- Agree やや思う
- Neither どちらとも言えない
- Disagree あまり思わない
- Strongly disagree 思わない

9. 10. My English SPEAKING skill will improve after playing games. 私は英語でゲームを通して、英語のスピーキング能力は上達できると思います。 \*

Mark only one oval.

- Strongly agree そう思う
- Agree やや思う
- Neither どちらとも言えない
- Disagree あまり思わない
- Strongly disagree 思わない

10. 8. My English READING skill will improve after playing games. 私は英語でゲームを通して、英語の読解能力は上達できると思います。 \*

Mark only one oval.

- Strongly agree そう思う  
 Agree やや思う  
 Neither どちらとも言えない  
 Disagree あまり思わない  
 Strongly disagree 思わない

11. 9. My English WRITING skill will improve after playing games. 私は英語でゲームを通して、英語のライティング能力は上達できると思います。 \*

Mark only one oval.

- Strongly agree そう思う  
 Agree やや思う  
 Neither どちらとも言えない  
 Disagree あまり思わない  
 Strongly disagree 思わない

12. 11. I will be more interested and motivated to learn English through games. 私は英語でゲームを通じて英語の学習意欲が上がると思います。 \*

Mark only one oval.

- Strongly agree そう思う  
 Agree やや思う  
 Neither どちらとも言えない  
 Disagree あまり思わない  
 Strongly disagree 思わない

13. 12. I will be able to improve my standard of English through games. 私は英語でゲームを通じて自分の英語能力を上達させられると思います。 \*

*Mark only one oval.*

- Strongly agree そう思う  
 Agree やや思う  
 Neither どちらとも言えない  
 Disagree あまり思わない  
 Strongly disagree 思わない

14. 13. What did you find enjoyable (if anything) about this game-based learning class? \*

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15. 14. Is there anything you do not like about this class? \*

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16. 15. How would you describe your written English level before this class? \*

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17. 16. Has this class helped improve your written English level? If yes, how has it improved it? If no, then why not? \*

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18. 17. What do you think about playing Minecraft in English as an English learning activity for the classroom? \*

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19. 18. After completing the seven gaming sessions do you think you will play Minecraft outside of this class in the future? \*

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20. 19. What did you think about chatting with other Japanese students in English using the chat function in Minecraft? \*

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21. 20. How did you like using written chat to communicate with your classmates? \*

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22. 21. Do you have any comments or suggestions?

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