

# **Vocabulary Differences between Gamers and Non-Gamers:**

A Quantitative Study of Finnish Upper Secondary School Students' English Vocabulary

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Master's Thesis

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The topic of this thesis is vocabulary differences between Finnish first year upper secondary school students who play digital games and who do not. In addition to studying gamers in general, this thesis focuses on players of Massively Multiplayer Online Role-Playing Games (MMORPGs) and how they differ in vocabulary size from gamers in general and non-gamers. While previous research has been done on playing digital games and its effects on vocabulary size, this thesis also analyses vocabulary size from the context of gaming vocabulary. The main objectives of the thesis were to find out whether MMORPG gamers have a broader vocabulary than non-gamers, how duration of gaming affects vocabulary size and what differences there are between MMORPG gamers and non-gamers in the context of gaming vocabulary.

This thesis utilised a questionnaire-based approach to gather data and to analyse the study groups quantitatively. The questionnaire consisted of a general information gathering part, a general vocabulary test and a gaming vocabulary test. A total number of 133 participants were gathered (n=133) by visiting three schools around Finland Proper.

The results of the thesis indicate that there is a statistically significant correlation between duration of gaming and gaming vocabulary test scores ( $p=0.025$ ). However, no significant differences were found when comparing MMORPG gamers' test scores to those of non-gamers. With these results, this thesis suggests that low frequency gaming words might be one of the reasons that gamers have performed better than non-gamers in vocabulary tests in previous studies.

**Key words:** digital games, vocabulary, second language acquisition, MMORPG, gaming vocabulary

## **Table of contents**

<b>1</b>	<b>Introduction</b>	<b>5</b>
<b>2</b>	<b>Theoretical Background</b>	<b>8</b>
2.1	Defining Gaming and MMORPGs	8
2.2	L2 Vocabulary Learning	10
2.3	Informal Learning	12
2.4	Digital Gaming and Language Learning	15
<b>3</b>	<b>Materials and Methods</b>	<b>19</b>
3.1	Participants	19
3.2	Data Gathering and Analysis	20
3.3	Structure of the Questionnaire	22
<b>4</b>	<b>Results</b>	<b>29</b>
4.1	Distribution of Gaming Habits in Participants	29
4.2	General Vocabulary Test	32
4.3	Gaming Vocabulary Test	34
4.4	Picture Tasks	36
<b>5</b>	<b>Discussion</b>	<b>39</b>
5.1	Comparison of MMORPG Gamers' and non-Gamers' General Vocabulary	39
5.2	Differences in Gaming Vocabulary	40
5.3	Temporal Aspects	41
5.4	Picture Tasks Compared to Other Tasks	43
5.5	Limitations of the Study	44
<b>6</b>	<b>Conclusion</b>	<b>45</b>
	<b>References</b>	<b>48</b>
	<b>Appendices</b>	<b>51</b>

## **List of Figures**

**Figure 1. Distribution of Gaming Habits between Participants 30**

**Figure 2. Scatter Plot of T2 Total and Days Played 42**

## **List of Pictures**

**Picture 1. Question 3 in the data gathering part of the questionnaire. 22**

**Picture 2. Question 5 in the data gathering part of the questionnaire. 23**

## **List of Tables**

**Table 1. Gaming Habits of Participants 29**

**Table 2 Gaming Habits of Participants in Days Played 31**

**Table 3. Full Results of the General Vocabulary Test 32**

**Table 4. Full Results of the Gaming Vocabulary Test 35**

**Table 5. Full Results of the Picture Recognition and Translation Task 36**

**Table 6. Correlation Matrix for Days Played and Both Vocabulary Tests 41**

## 1 Introduction

Digital games have been a topic of study, discussion and controversy for almost their whole existence. Games have been attributed with various negative and positive phenomena from being nerdy or causing violence to being trendy and facilitating learning, for example by reducing anxiety. One of the lowest points of the public's view on digital games was around the 1990s, during which violent digital games were subjected to congressional hearings and lawsuits when said games were thought to cause violent behaviour in players. Even though no correlation has been found between digital games, violent or otherwise, and violent behaviour, many still associate digital games with these negative aspects (Elson & Ferguson 2014, 35-40). The aforementioned points make studying digital games, and especially their potential positive aspects, relevant today so that a realistic understanding rooted in facts can be established regarding them.

This thesis examines informal learning and vocabulary acquisition from Massively Multiplayer Online Role-Playing Games (MMORPG), such as World of Warcraft and RuneScape. More specifically, genre-specific vocabulary acquisition and similarities or differences between MMORPG gamers and non-gamers are focused on. Furthermore, gaming habits are studied to find out how duration of gaming affects vocabulary acquisition. This was achieved by conducting a quantitative study using a questionnaire-based approach. First, general information of the participants was gathered in order to map out the participants' English studies, as well as their gaming habits. The general information gathering part contained questions such as what games they play or have played, how long they have played said games and how much they play daily. This was done to separate MMORPG gamers from non-gamers, and to map out duration of gaming in gamers. The questionnaire itself consisted of two vocabulary tests: a general vocabulary test and a gaming vocabulary test. The general vocabulary test was formed according to frameworks in previous studies, such as Nation & Hunston (2013). The purpose of the general vocabulary test was to see whether MMORPG gamers have a broader vocabulary than non-gamers in a general sense. After the general vocabulary test the participants did a gaming vocabulary test. This test was otherwise similar to the general vocabulary test but contained genre-specific words instead of words in general. The specific nature of these gaming vocabulary words is explained in section 2.1. As this genre-specific approach to vocabulary tests is novel, a precedent study or framework does not

exist. Thus, the gaming vocabulary test will be made in the same manner as the general vocabulary test, utilising Nation & Hunston (2013) with the only difference being the aforementioned words themselves. The questionnaire and vocabulary tests will be explained in detail in section 3.3. The population that this thesis studies are Finnish first year upper secondary school students because studying older students in favour of younger ones provides better results regarding duration of gaming. This is because older students are more likely to have played digital games for an extended period of time. A total of 133 participants (n=133) were gathered from three upper secondary schools around Finland Proper.

The goal of the present study was to find out what similarities and differences MMORPG gamers have with gamers in general non-gamers in the context of general vocabulary and genre-specific vocabulary. Additionally, the present study aims to discover what type of effect duration of gaming has on vocabulary acquisition. In the form of research questions, this thesis sets out to answer the following questions:

1. Do MMORPG gamers have a broader vocabulary than non-gamers?
2. How does duration of gaming affect vocabulary acquisition?
3. What differences or similarities do MMORPG gamers and non-gamers have in gaming-specific vocabulary?
4. What differences are there between MMORPG gamers and non-gamers in the context of picture tasks?

I hypothesise that MMORPG gamers will have an advantage in both general vocabulary and genre-specific vocabulary. This is due to previous studies, especially Sundqvist & Sylvén's 2012 article "World of VocCraft: Computer Games and Swedish Learners' L2 English Vocabulary", which found that Swedish learners who played World of Warcraft, an MMORPG game, scored better in general vocabulary tests than learners who did not play World of Warcraft.

In the context of the fourth research question, I hypothesise that picture tasks will produce different scores from other types of tasks in the gaming vocabulary test. As MMORPGs are most generally played in English, it is likely that MMORPG gamers will be able to recognise English words based on their pictures, but not necessarily translate them. This is due to

MMORPGs often having items named and described in addition to the visual aspect of the player seeing the item, which creates both a connection in an L2 English speaker with a word in English, as well as a discrepancy in terms of their L1. An example of this would be a word like *cutlass*, which refers to a short, curved sword that was used especially by sailors (*Oxford English Dictionary* s. v. “cutlass,” n.). Seeing a picture of a word and its name in English might make it possible for the player to understand what the word means as well as be able to recognise it in a test setting. However, without looking up the word in a dictionary or asking someone for its L1 translation, the player will likely be unable to translate the word. Considering the cutlass example, a Finnish player might recognise the word as well as a picture of it, maybe even the context in which it was used in real life. However, the Finnish translation of it, which is *hukari*, will very likely be inaccessible to the player. Since there are no previous studies on this matter, this hypothesis is in large part tentative, but still merits further analysis because of its novel aspect and potential new discoveries regarding L2 English learning through digital games.

The following section contains the theoretical background of the thesis. First, key concepts, such as gaming and MMORPGs will be defined. This will be followed by theoretical aspects and earlier works on vocabulary and informal learning. In addition, digital gaming and its association with language learning will be introduced. In section 3, the empirical part of the thesis is provided and explained. This section includes a detailed description of what participants were selected for this thesis, how the data gathering was conducted and how the questionnaire was structured. This is done so that the present study could be replicated accurately for future studies. Ethical considerations are also provided in this section.

Following section 3, the results of the conducted study are presented in section 4. Section 4 focuses on describing and analysing the results themselves, rather than drawing conclusions. Discussion of the results and how they answer the research questions and hypotheses of the thesis is provided in section 5. Lastly, section 6 sums up the most important findings of the study, along with their implications and potential for future studies.

## 2 Theoretical Background

The theoretical background of this thesis begins with defining key concepts, such as what constitutes as gaming and what MMORPG games are. The definitions are provided to ensure that there will be no confusion when discussing various digital games and genres. This is followed by the vocabulary part of the theoretical background. The vocabulary part consists of key concepts regarding vocabulary and vocabulary learning. Furthermore, works relevant to the topic are introduced, such as Schmitt (2007) and Nation & Hunston (2013). The informal learning part is similar in structure to the vocabulary part, containing both definitions of concepts and presenting relevant earlier studies, such as Krashen (1984), Ellis (2009) and Swain (1993). Lastly in this section, digital games and their association with language learning will be examined in detail to provide a clear picture of what has been studied, what remains unclear and what theories have surfaced in the field regarding gaming and language learning. Sylvén & Sundqvist (2012) and Sundqvist & Sylvén (2012) are especially relevant for this thesis because of the similarity of their research to the present study, the findings of their study, their theories and their studies being recent. Thus, both scholars and their research will be explained in greater detail.

### 2.1 Defining Gaming and MMORPGs

As was mentioned earlier in the introduction section, this thesis studies learner vocabulary from the perspective of digital games, and more specifically, massively multiplayer online role-playing games (MMORPGs). For this thesis, the term digital game is used to refer to all video games that a person might play from computer games to console games and mobile games. Even though the terms video game (Gee 2007) and computer game (Sundqvist & Sylvén 2012) are used in research literature as well, the term digital game is the most all-encompassing of the three, and the most fitting when discussing games in general. In contrast, when discussing a specific game or genre, such as MMORPGs, they will be referred to with their specific terms.

Before discussing MMORPGs and their role on language learning and vocabulary acquisition, it should be made clear what MMORPGs are, what kinds of games they contain, and what they are like in the context of this thesis. Even though the term MMORPG might feel unfamiliar to some readers, its full name without the acronym tells exactly what a game



in the genre is like: a massively multiplayer online role-playing game. Massively multiplayer refers to the game being larger scale than more traditional multiplayer games. While a game with two players can be called a multiplayer game, a player in an MMORPG can easily play simultaneously with thousands of players. Role-playing game refers to a genre of games in which the player controls the actions of characters in the game world. RPGs can be a genre on their own, especially single-player games and board games. Thus, in its simplest form, an MMORPG is an RPG combined with online multiplayer with a massive number of players. To accompany this brief and simple definition, Mark Peterson provides a good explanation in his own terms as to what significant features an MMORPG contains:

MMORPGs are a genre of network-based role-playing games where large numbers of individual players interact within a graphically rich and permanent 2D or 3D virtual world that is usually based on a fantasy theme. (Peterson 2012, 71)

The fact that MMORPGs are often based on a fantasy theme means that different games in the MMORPG genre tend to contain similar types of features, which is important for the present study. As this thesis examines vocabulary between MMORPG gamers and non-gamers from the perspective of general vocabulary and gaming vocabulary, the gaming vocabulary must span multiple games, instead of the vocabulary only appearing in one MMORPG game and not in another. For example, words that appear only in a specific game, such as *blurite ore* in RuneScape or *progenium ore* in World of Warcraft, would require a person to play and be familiar with that specific game and could not recognise these words otherwise. These types of words are not relevant for the present study, because the present study examines low frequency words that have a higher frequency in digital games. This is why it is important that MMORPGs often feature a fantasy theme, and what makes MMORPGs the ideal genre for the present study. Because of the similar themes in MMORPGs, different games often contain the same or similar words, such as *Dragon halberd* in RuneScape and *Halberd of Smiting* in World of Warcraft. The Oxford English Dictionary (OED) provides a frequency band for its entries, which can be used to see how often a word appears in modern English usage. The word *halberd* belongs in frequency band 4, which means the word is “marked by much greater specificity and a wider range of register, regionality, and subject domain than those found in bands 8-5” (*Oxford English Dictionary* s. v. “halberd,” n.). This indicates that *halberd* is a low frequency word in modern English but appears more often in MMORPGs

with 10 different halberds in RuneScape and over 50 in World of Warcraft, making the word relevant for the present study. More specific information on the types of MMORPGs relevant to this thesis will be provided in the Materials and Methods section.

Kinzie and Joseph (2008) suggest six game play activity modes for middle school children, which they based on their earlier 2005 study. They found these patterns by conducting a case study on 20 children and analysing the participants' game play preferences. The game play activity modes were as follows: active play, explorative play, problem-solving play, strategic play, social play and creative play. An important factor to note is that MMORPGs contain all of the aforementioned game play activity modes (Sundqvist & Sylvén 2012, 202). This means that because MMORPGs contain such a wide variety of gameplay activity modes, MMORPG gamers are also likely to experience multiple, if not all types of informal language learning, such as incidental learning, input, output and interaction. These types of informal learning will be discussed further in section 2.3.

## **2.2 L2 Vocabulary Learning**

Before analysis of vocabulary connections between MMORPG gamers and non-gamers or discussion of theories of vocabulary acquisition can be started, the term itself should be explained. Nation proposes a broader definition of vocabulary. Instead of defining vocabulary as a list of words that a learner knows in an L2, Nation suggests that vocabulary is interconnected to other aspects of language, and that there are multiple types of vocabulary, such as receptive and productive vocabulary (Nation 2013, 48). Vocabulary does not only refer to knowing a word in an L2 or not, but instead can refer to, for example, recognising a word, recalling a word, producing a word, being able to write the word and being able to say the word out loud (Nation 2013, 50). Attempting to establish a full picture of a person's vocabulary from all vocabulary perspectives, especially when studying over one hundred people, would be both extremely difficult and time consuming. Thus, in the context of this thesis, the receptive and productive aspects of the written form will be focused on due to the earlier reasons presented.

Norbert Schmitt supports Nation's broader definition of vocabulary (Schmitt 2007, 829). Furthermore, he argues that vocabulary learning has an incremental nature, and that

vocabulary acquisition is incremental in multiple ways. Regarding vocabulary acquisition he states as follows:

First, lexical knowledge is made up of different kinds of word knowledge, and not all can be learned simultaneously. Second, each word knowledge type may develop along a cline, which means that not only is word learning incremental in general; learning of the individual word knowledge aspects is as well. (Schmitt 2007, 831)

Schmitt continues that because of the incremental nature of vocabulary learning, a learner needs continuous contact and repetition with a word in order for them to learn it (*ibid.*). This means that high frequency words are easier to learn than low frequency words, which indicates in the context of this thesis that gaming-specific words are harder to acquire for learners because of their low frequency. In addition to a word's frequency, other factors also affect the ease or difficulty of acquiring new words, such as whether the learner is in an environment where the target language is used, memory and cognitive abilities of the learner and the type of target language words to be learned (Niitamaa 2015, 142-145). Since these low frequency words appear more often in MMORPG games, as in the halberd example provided in section 2.1, gamers should have an advantage over non-gamers in acquiring this vocabulary. Furthermore, MMORPGs place the player in a target language environment, which further facilitates acquisition of new vocabulary.

Nation argues that when it comes to broadening vocabulary, there are three major cognitive processes that facilitate learning: noticing, retrieval, and creative use. Furthermore, other conditions also affect the learning of new words, such as motivation, word consciousness and retention (Nation 2013, 102-114). Noticing refers to the learner focusing their attention on an item and noticing that the word is a useful language tool. Noticing occurs when a word is looked up in a dictionary or when the word is explained to the learner (*ibid.*). The importance of noticing for L2 learning in general has been argued also by Schmidt (2001), which will be briefly discussed in section 2.3.

Retrieval refers to the process of retrieving the meaning of a word when encountering said word productively, such as in writing or speaking, or receptively, such as in reading or listening. Retrieval does not occur when the form and meaning of a word are presented

simultaneously. After noticing a new word, subsequently having to retrieve the word will strengthen learning (Nation 2013, 107). This means that consecutive retrieval in the form of repetition facilitates the remembering of a new vocabulary item, as was also argued by Schmitt (2007, 831). Several other studies have also shown repetition to be a crucial part in learning vocabulary. For example, Vidal found that, in the context of incidental learning when reading and listening: “In the reading model, the greatest increase in gain occurred between two and three repetitions” (Vidal 2011, 241). Similar results were also found by Brown in a study done on incidental vocabulary acquisition regarding reading and listening (Brown, Waring & Donkaewbua 2008).

Creative use, which was also sometimes referred to as generation, means that a learner uses a newly learned word in a manner that is different from the way it was introduced to the learner, such as using different inflections of the new word (Nation 2013, 110). This process reconceptualises the learner’s knowledge, which further supports the learning of vocabulary. Research on creative use is still limited, but negotiation and accompanying text with pictures is thought to deepen processing of words and facilitate learning (Nation 2013, 111). The use of pictorial elements is especially interesting for this thesis, because gaming word recognition from picture tasks is one of the points of interest of the present study.

### **2.3 Informal Learning**

Informal and formal learning are multifaceted concepts in the field of Second Language Acquisition (SLA), not to be confused with other similar concepts such as implicit vs. explicit learning and incidental learning. Implicit learning is a fairly new concept, and subject to some controversy, particularly regarding whether implicit learning exists at all or not. Because informal and incidental learning are the foci of the theoretical background of the present study, implicit and explicit learning are skimmed in order to differentiate them from the other concepts. After this, theories and previous studies will be provided on the more relevant topics, especially informal learning.

Ellis explains that implicit and explicit learning originate in cognitive psychology, according to which implicit learning happens with the learner being unaware of learning taking place, and that learning takes place without the learner’s intent (Ellis 2009, 3). As was mentioned before, implicit and explicit learning have been subject to controversy in both the fields of

cognitive psychology and SLA, especially on the matter of whether learning can be divided into these distinct types of learning, and whether learning can take place without awareness (Ellis 2009, 5). From the perspective of this thesis, the important point is that implicit and explicit learning should not be confused with informal and formal learning or acquisition and learning. Even though learning is explicit, meaning that the learner is aware of what they are trying to learn, the learning can still be informal, as it is in the learning through gaming perspective.

One of the pioneers in terms of informal learning in the field of SLA is Stephen Krashen, who has played a large role in terms of developing theories and hypotheses, as well as publishing a high number of publications. He developed five hypotheses of SLA, which are as follows: the input hypothesis, the acquisition-learning hypothesis, the monitor hypothesis, the natural order hypothesis and the affective filter hypothesis (Krashen 1984). The input hypothesis and acquisition-learning hypotheses are especially important in the context of this thesis. Even though these hypotheses are today a bit dated and criticised, for example, for not considering the role of output and interaction in language learning (Long 1981, Swain 1995), they still provide a baseline for discussion on informal learning and theories regarding it. According to the input hypothesis, language learning takes place as long as there is comprehensible input, and there is enough of it. Comprehensible input refers to aspects of language that are almost within reach of the learner, but not quite, also referred to as  $i+1$ . The acquisition-learning hypothesis, on the other hand, refers to Krashen's hypothesis that language can be developed using two distinct methods: by acquisition or by learning (*ibid.*). In this context, learning is considered a conscious process, such as language learning in a school setting, and similar to explicit learning that was discussed in the earlier paragraph. Acquisition, however, mirrors implicit learning in the manner that acquisition is intuitive, subconscious and that learning often takes place without the learner being aware of it. While MMORPGs constantly provide situations where acquisition according to Krashen might happen because of the social and interactive qualities of MMORPGs, the input that a player receives varies from its comprehensibility. As was mentioned in section 2.1, words related to games and MMORPGs are often rare in general discourse, which would mean that a player with lower English proficiency might not experience comprehensible input that much, and would not implicitly and unconsciously acquire these gaming words.

Continuing on the matter of acquisition and awareness, Schmidt (2001, 3) argues against the unawareness part of implicit learning and acquisition, suggesting that attention is required in every aspect of SLA. While a definitive answer to such a question is impossible, evidence has been found that indicates a positive correlation with attention and learning, especially in less salient aspects of L2 input (Schmidt 2001, 29). Furthermore, this denial of a restrictive definition of acquisition and learning opens discussion on other facets of L2 learning, such as output, interaction and social learning.

The role of interaction and output was in large part left out by Krashen in favour of input. Long argued in favour of the relevance of interaction in informal learning, along with other scholars such as Mackey and Pica. Long introduced his interaction hypothesis in order to bridge this gap in the field of SLA (Long 1981). According to the interaction hypothesis, comprehensible input remains a crucial, albeit not the only aspect when it comes to second language acquisition. Long argued that when a learner modifies input so that the input is more easily comprehensible, and when it is done so using interaction, language learning is facilitated (ibid.). Long further developed this hypothesis in his 1996 work *The Role of the Linguistic Environment in Second Language Acquisition*, where he introduced negotiation of meaning. Negotiation of meaning refers to conversation between people where, through interaction, people establish an understanding of the message they are attempting to convey (Long 1996). An example of this are clarification requests, where a person prompts clarification from the interlocutor's utterance (ibid.). This is especially important in the context of MMORPGs, in which less experienced gamers often ask more experienced players for advice in L2 English. Furthermore, interaction in this manner prompts language production in the learner, instead of just improving receptive knowledge. Output has been argued to facilitate language learning and enable the learner to achieve a higher level of proficiency at a target language (Gass & Mackey 2006, 13).

One of the most impactful researchers of output was Merrill Swain, who introduced the output hypothesis and three functions of output: noticing, hypothesis testing and metalinguistic reflection (Swain 1995). Swain argued that through pushed output, a learner is able to notice a gap in their language understanding, test hypotheses regarding the target language, such as grammar, and to reflect and improve their language knowledge based on the feedback they receive (ibid.). Although the output hypothesis has been criticised, evidence has

also been found in favour of the relevance of output for language learning. For example, Izumi argued in his 2002 experiment that “[w]ithout denying the essential role of input in SLA, the present study provided empirical evidence for a psycholinguistically motivated role of output in L2 development” (Izumi 2002, 573). He found that output promotes noticing and processing of target language structures (ibid.). In the context of MMORPGs and gaming, the role of output is similar to what was said of interaction and gaming in the previous paragraph.

Another key aspect when it comes to language learning is the social aspect of learning. This, along with the concepts of *scaffolding* and the zone of proximal development (ZPD) were introduced by Vygotsky in his work *Mind in Society: The Development of Higher Psychological Processes* (Vygotsky & Cole 1978). Vygotsky proposed regarding the zone of proximal development: “It is the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers.” (Vygotsky & Cole 1978, 86). The process of this collaboration or guidance is called scaffolding. For the present study, the important term here is collaboration with more capable peers. MMORPGs such as *World of Warcraft* and *RuneScape* are both highly social (Gee 2007) and contain a high population of players, which means that there is a high number of opportunities for scaffolding and collaboration between players. Furthermore, as with many other digital games, MMORPGs often have a level system, which illustrates a player’s development in the virtual world. Thus, unlike in the real world, a new player can instantly see another player’s degree of competence from their in-game level, and can thus determine whether the higher level player might be able to help the new player.

## **2.4 Digital Gaming and Language Learning**

Learning via digital games utilises much of the same functions that takes place when learning a second language in general: comprehensive input, social learning, scaffolding and interaction. This is especially true for MMORPGs, because teamwork and cooperation are crucial parts in these types of games. To sum up the theoretical frameworks introduced in the previous subsection and to express their relevance for gaming and language learning, it should be explained how these frameworks are utilised when playing MMORPGs. As was mentioned earlier, MMORPGs are games where large numbers of players play together and interact with

one another. Thus, a player will be able to experience input, output, interaction and social learning while playing MMORPGs, which is why all of the abovementioned theoretical frameworks needed to be explained. The social aspect of MMORPG gaming is especially important and has been shown to affect language learning. Furthermore, this stretches beyond the MMORPGs themselves to unofficial collective knowledge resources, such as wikis and forums. Steinkuehler and Duncan found in their study on a wiki of *World of Warcraft* that “[o]verwhelmingly, game related forums like the one examined here are rich sites for social knowledge construction” (Steinkuehler & Duncan 2009, 540). As for interaction and social aspects of learning, Schrader and McCreery’s study on the acquisition of expertise in *World of Warcraft* suggested the following:

The interactive nature of [MMORPGs] provides learners opportunities to access vital information via social networks and construct knowledge as the result of social collaboration. Research also indicates that expertise is related to the acquisition of knowledge and development of performance. The structure of [MMORPGs] includes a quest system that promotes deliberate, functional epistemology toward this end. In a learning context, intentional interaction with knowledge and content is consistent with contemporary constructivist approaches. (Schrader & McCreery 2008, 570)

These findings suggest that MMORPGs are virtual worlds in which interaction and social knowledge is an inherent part of a player’s gaming experience. A player is constantly presented with opportunities for language acquisition through the input they receive when playing the game, as well as through interaction with other players and the community. While MMORPGs might not be applicable to an educational context (Schrader & McCreery 2008, 570) due to their function as an entertainment activity, there is still much more to be learned about gaming and its effects on learning.

As was mentioned in the beginning of this section, Sylvén & Sundqvist (2012) and Sundqvist & Sylvén (2012), along with their other research, are among the most relevant studies regarding digital games and language learning in the context of this thesis. Both have studied digital gaming and L2 learning from a variety of perspectives, including vocabulary. Furthermore, both scholars have studied mainly Swedish middle and secondary school students, although some studies have also been conducted with other Nordic countries. Thus, Sundqvist and Sylvén provide a clear image of how Swedish learners of English learn English



through digital gaming. The present study aims to provide a Finnish perspective on this matter. Furthermore, Sundqvist and Sylvén use the term *extramural English* in their publications when discussing learning during digital gaming. This term, coined by Sundqvist in her doctoral thesis *Extramural English Matters: Out-of-School English and Its Impact on Swedish Ninth Graders' Oral Proficiency and Vocabulary*, refers to the following:

In extramural English, no degree of deliberate intention to acquire English is necessary on the part of the learner, even though deliberate intention is by no means excluded from the concept. But what is important is that the learner comes in contact with or is involved in English outside the walls of the English classroom. (Sundqvist 2009, 25)

In this sense, extramural English can be learning through any activity outside the English classroom, and not just playing digital games. Regardless, the term fits perfectly to the theoretical frameworks and digital gaming that were discussed in the earlier sections. Learning through extramural English can be completely incidental or intentional and through acquisition, output or interaction. Sundqvist's study also found results suggesting that extramural English correlates positively with vocabulary size (Sundqvist 2009, 184). She studied a total of 80 ninth grade Swedish learners of English in an attempt to find out what type of impact extramural English had on the vocabulary of the learners. Extramural English activities were collected through a language diary, and vocabulary was tested using a shortened version of Nation's Vocabulary Levels Test. Because this thesis also utilises the Vocabulary Levels Test, the test will be discussed in length in section 3.3 of Materials and Methods. Sundqvist further noticed that boys scored higher on the vocabulary test than girls. Furthermore, boys were shown to participate more in productive extramural English, especially playing digital games. Productive extramural activities were shown to correlate positively to higher scores in the vocabulary test (Sundqvist 2009, 202). These findings not only show that extramural English has a positive effect on vocabulary size but suggests that playing digital games might have a particularly high facilitative effect on vocabulary.

One of Sylvén and Sundqvist's publications that is close to the topic of this thesis is their 2012 article "Gaming as Extramural English L2 Learning and L2 Proficiency Among Young Learners" (Sylvén & Sundqvist 2012). They studied young Swedish learners, a total of 86 learners aged 11-12, and gathered data utilising a questionnaire, language diary and three proficiency tests. The questionnaire provided information on the learners' extramural English

activities, and the proficiency tests provided information on their English proficiency. Regarding the results, Sylvén states as follow: “The results highlight what seems to be a trend, namely that there is a positive correlation between L2 proficiency and how much time is spent on playing digital games, at least as measured in the present study” (Sylvén & Sundqvist 2012, 314). While these studies suggest that playing digital games result in higher English proficiency and vocabulary, they do not provide answers regarding how this happens. Whether learners who play digital games learn new, lower frequency gaming words, and hence have a broader vocabulary than non-gamers, or whether gamers experience informal learning through participation in social activities during gaming, or something else entirely. Instead of studying whether gamers have a broader vocabulary than non-gamers, this thesis examines how the vocabularies of gamers and non-gamers differ, which is something the aforementioned previous studies have not done.

### **3 Materials and Methods**

In this section, a detailed explanation of data selection and gathering will be provided. This section elaborates on, for example, why Finnish upper secondary school students of English in particular were selected and how the data gathering was conducted. Furthermore, materials used in this thesis are provided, such as frameworks for the vocabulary tests, in addition to an explanation of why they were selected.

#### **3.1 Participants**

The participants selected for this thesis are Finnish first year upper secondary school students of English from schools around Southwest Finland. The total number of participants is 133 ( $n=133$ ) students from three schools. The present study chose the Finnish perspective because this thesis is made in Finland, meaning that studying Finnish students is most feasible. Furthermore, as was mentioned in Section 2.4, there is a lack of Finnish studies regarding gaming and its effects on language learning.

First year upper secondary school students were deemed better for this study in favour of second or third year upper secondary school students or students at other stages of education for three reasons. First, the initial English course in an upper secondary school, which is called ENA1, tends to have a larger group size because all the students are at the same point in their English studies. This makes it possible to gather the maximum number of participants per school, which makes data gathering easier. Second, the first upper secondary school English course ENA1 is defined in the Finnish curriculum as a course where a student broadens their language awareness and maps out their learning strategies (Lukion Opetussuunnitelman Perusteet, 2019, 180). Lastly, upper secondary school students are the best study group for this thesis due to their age. Because of the second research question of the present study “How does duration of gaming affect vocabulary acquisition?”, information is needed on how often and how much the participants play MMORPG games. Studying upper secondary school students instead of younger ones increases the likeliness of having more gamers in the population that play games frequently. A 17-year-old gamer will probably have played MMORPGs more than a 14-year-old because of the three-year age gap. Having non-gamers, gamers and frequent gamers in the population is important to answer the second research question of the thesis. Additionally, studying older students is better from an ethical

point of view. When studying upper secondary school students, informed consent is enough when the study does not collect personal data. This ensures data protection and privacy for the present study and for the participants. Further information on the privacy protection and ethical aspects of this thesis are provided in Section 3.3.

### **3.2 Data Gathering and Analysis**

The data gathering of this thesis was conducted in a manner that maximised the number of potential participants per school. After constructing and piloting the questionnaire, upper secondary schools were contacted in order to find out whether they would like to participate in the present study. More information on the specific structure of the questionnaire is provided in the following section. Schools were mainly contacted by phone, either by calling the school office or the headmaster directly, after which they were informed of the nature and structure of the present study and questionnaire. Schools were informed that this thesis does not collect private information of the participants and that the questionnaire is in line with national and European data protection legislation. The process of contacting schools about taking part in the study was conducted in around May so that schools were informed well in advance of the actual data gathering.

Data gathering took place around August, shortly after the beginning of the 2022-2023 school year in Finland. The schools were visited personally one by one, during which a small portion of around 20 minutes of an English lesson was reserved for the questionnaire. The students were made aware of the nature of the thesis, the questionnaire, what the questionnaire was used for in the context of the present study, and that the questionnaire did not affect the students' grade in any way. An example question and answer were written on the whiteboard in order to ensure that every student knew what the questionnaire was like. The students were shown how to access the questionnaire, which was made electronically. More specific information about the questionnaire itself is provided in the following section. Because the questionnaire was electronic, students needed to have a computer or smartphone available to them in order to do the questionnaire. After making sure that all the students could access the questionnaire and they knew how to do the questionnaire, the students were allowed to start doing the questionnaire. When the students were finished with the questionnaire, the data gathering for that specific school was complete. The students and the teacher were thanked for

participating, after which the same data gathering process was repeated for other schools until a sufficient number of participants had been gathered.

Upon reaching the target number of participants, an analysis of the gathered data was initiated. The raw data was first organised using the general information that the participants provided about their English learning and gaming habits. First, gamers were separated from non-gamers, after which gamers were divided by frequency and rate of gaming to gamers and frequent gamers. This was achieved by utilising an equation to produce a value named *days played* in this thesis. More information on the value of days played and the full description and analysis of the data is provided in Section 4.

The organised data were then analysed to answer the research questions of the present study. Because this thesis studies MMORPG gaming and its effects on vocabulary acquisition, correlation and bivariate analysis are the most relevant inferential statistics in this context. Thus, this thesis utilises Shapiro-Wilk for testing normality, Pearson's independent samples t-test for normal distribution, Mann-Whitney U-test for non-parametric testing, and Spearman's  $\rho$  for correlation measurement. The Shapiro-Wilk test for normality was chosen because statistical tests for comparing differences were chosen based on whether the data were distributed normally or not. Furthermore, Larson-Hall (2015, 99-101) argues that it can be impossible to know whether data is normally distributed or not unless a data set is large. Thus, the use of a test for normality is relevant for this thesis because of the small size of some groups.

The questionnaire was done in Finnish to ensure that every participant was able to understand what they were supposed to do in each task and so that the instructions were as clear as possible for them. Furthermore, the classes in the schools visited were very homogenous, and did not contain anyone who was not able to speak Finnish, which makes the use of Finnish rather than English more efficient for the participants. Lastly, because this thesis specifically pursued a Finnish perspective and to study Finnish students, it was assumed that Finnish was the L1 of all participants.

For analysing correlation, the present study's choice of Spearman's  $\rho$  is supported by Larson-Hall (2015, 174). Further points that make this statistic test fitting for this thesis is that there are two variables to analyse, they do not have levels in them, and both variables are

continuous. Lastly, the use of t-tests for studying differences is also supported by Larson-Hall (2015, 179). Student's independent samples t-test and Mann-Whitney U-test were fitting for this thesis because the variables analysed contained two variables at a time, and the test groups were different from one another. This thesis used two t-tests because one set of data were normally distributed, while the rest of the data was not distributed normally.

### 3.3 Structure of the Questionnaire

Data was gathered for this thesis using a questionnaire, which was divided into three parts: information gathering, a general vocabulary test and a gaming vocabulary test. The structure of the questionnaire is provided in the appendices section. In the information gathering part the participants were asked questions regarding their English learning and studying and their gaming habits. The first priorities that the information gathering needed to answer was whether the participant plays digital games or not, followed by what types of digital games they play and how much. This was achieved by asking questions related to this early in the information gathering with both multiple choice and open questions. An example of this are questions 3 and 5 in the questionnaire, which are presented here as Picture 1 and Picture 2:

#### 3. Pelaatko vapaa-ajallasi digitaalisia pelejä (videopelejä)?

- Kyllä
- En
- Pelasin aikaisemmin, mutta en enää

Picture 1. Question 3 in the data gathering part of the questionnaire. English translation: "Do you play digital games (video games) in your free time?" Answers: "Yes, no, I used to play, but not anymore"

Picture 1 illustrates question 3 of the questionnaire, the primary use of which was to establish whether a participant is a gamer or a non-gamer. A gamer refers to a person who plays digital games, regardless of duration or frequency of gaming. In contrast, a non-gamer refers to a person who does not play digital games at all. An important addition to question 3 is that it includes an option of earlier gaming, even if the participant does not currently play. This

makes it possible to group participants who used to play digital games as gamers. Participants who have quit playing digital games might answer “no” to a question that only asks whether they play digital games or not, even though they might have played digital games for over a year in the past. In such cases the effect that the previous gaming had on language learning can still be in place, which results in a false negative in the data when answering “no” to whether they play or not. Thus, the third option was added to question 3, which in practice means that “yes” and “I used to play” both result in the participant being categorised as a gamer, while “no” results in them being categorised as a non-gamer.

### 5. Millaisia eli minkä genren digitaalisia pelejä pelaat tai olet pelannut vapaa-ajallasi?

- MMORPG esim. RuneScape (Massively multiplayer online role-playing games)
- FPS esim. Call of Duty (First person shooter)
- MOBA esim. League of Legends
- Battle Royale esim. Fortnite
- Tactical shooter esim. Counter Strike: Global offensive
- Simulaattori esim. The Sims
- Urheilu esim. NHL
- Mobile esim. Candy Crush
- Joku muu, mikä?
- Jos pelaat jotain peliä, mutta et tiedä genreä, kirjoita se tähän

Picture 2. Question 5 in the data gathering part of the questionnaire. Lists different genres of digital games that the participant might play, along with an open-ended question at the bottom if they play something that was not listed.

Picture 2 shows question 5 of the questionnaire, a multiple-choice question regarding which genres of digital games a participant plays. Much like in other types of media such as movies, digital games have a myriad of different genres, which is why it is important to provide the participant with an open text space where they can fill out their own most played genre. The most popular genres of digital games were provided so that the participant could quickly tap the genres that they might play instead of making them think of genres themselves in a fully open-ended question. The most relevant choice here is MMORPG because it is also the

perspective from which this thesis approaches gaming and language learning. A participant can be considered an MMORPG gamer if they fill two requirements. First, they must be categorised as a gamer, which was explained in the previous paragraph regarding question 3 of the questionnaire. Second, the participant must play MMORPGs. Participants were considered to play MMORPGs if they ticked the MMORPG box in question 5, which is illustrated in Picture 2 above. Furthermore, a participant could mention games in the last part of question 5, or in question 6, which was an open-ended answer type question regarding what games the participant plays. If an MMORPG was listed in either answer, they were considered MMORPG gamers, and relevant for the present study.

The information gathering part is followed by a general vocabulary test, which was used to measure the of the participants' general vocabulary levels. Measuring general vocabulary enabled the comparison of general vocabulary between MMORPG gamers and non-gamers, which was used to answer the first research question of this thesis. Furthermore, measuring both general vocabulary and gaming vocabulary makes it possible to compare the two and to discover possible findings. Both the general vocabulary test and the gaming vocabulary test utilise frameworks for vocabulary testing from previous studies, such as Dörnyei & Tahuchi (2010), Sylvén & Sundqvist (2012) and Nation & Hunston (2013).

Both vocabulary tests consist of receptive and productive tasks in addition to translation tasks. Receptive tasks are mainly “choose the correct option or translation” types of questions, which provide fast and easily measurable information regarding a participant's vocabulary (Dörnyei 2010, 26). The productive tasks contain questions such as “fill in the missing word in English” and “translate into Finnish”. Furthermore, the gaming vocabulary test contains a picture task, in accordance with research question four of the thesis regarding differences in vocabulary test task scores between picture tasks and other tasks. The general vocabulary test has a total of four tasks: one receptive task, one receptive translation task, one “fill in the blank” type productive task and one productive translation task. The gaming vocabulary test, on the other hand, includes six tasks: a receptive translation task, a receptive task, a receptive picture task and two productive translation tasks. The total number of items in each vocabulary test is 30, meaning that the total number of items that a participant answers to is 60. 30 items per vocabulary test were deemed sufficient because earlier research and frameworks on vocabulary tests suggest that a vocabulary test should have at least 30 items in



order to be reliable (Nation 2013, 536). Furthermore, making a longer vocabulary test would make it more difficult to gather data in schools during classes, especially since the present study's questionnaire contains two vocabulary tests instead of one.

Item selection for the vocabulary tests was done according to frameworks established by Paul Nation, especially his Vocabulary Size Test and Vocabulary Levels Test. These tests measure an individual's total vocabulary and their knowledge in specific word frequency levels. In the Vocabulary Levels Test, words from different frequency levels are tested, such as words in the 1 000 most common word list, 2 000 most common, and so forth. This can be used to understand a person's vocabulary from a rarity perspective, which is especially important in the context of this thesis, since most gaming words are uncommon words. Both vocabulary tests in the present study were made with the Vocabulary Levels Test in mind. Items increase in rarity as the vocabulary test proceeds, meaning that the words get progressively harder to recognise and translate. Because gaming words are, by default, more uncommon than words in general discourse, gaming words start from a higher difficulty threshold. However, the gaming vocabulary still follows the same principle of incremental difficulty scaling. While the general vocabulary test starts from the 1 000 word categories and increases in difficulty from there, the gaming vocabulary starts from a higher rarity, such as the 6 000 word category and proceeds from there. This approach enables the comparison of general discourse vocabulary and gaming vocabulary, and whether the participants of the present study are able to recognise gaming words better.

The thousand most common words category that is used in the Vocabulary Levels Test is provided by the Compleat Lexical Tutor (Cobb), an online resource that contains various tools for analysing text by word categories, frequency and so forth. As of this point, Compleat Lexical Tutor is referred to as Lextutor. Using the vocabulary profiler tool allows the user to copy a large chunk of text and paste it to the text field in the tool. After this, Lextutor automatically analyses the text, providing the user with a comprehensive list of the frequencies for each word in the text using the thousand most common words measurement. Lextutor is a valuable asset for this thesis since it makes it possible to find words of various rarity from texts that can be controlled by the user, which enables the study of gaming words as well as general discourse words.

The gaming vocabulary test required slight adjustments regarding item selection when compared to the general vocabulary test. Because the general vocabulary test measured everyday vocabulary, word frequencies from a general corpus could be utilised, such as those found in Lextutor and the OED. However, because the gaming vocabulary test measures words that are rare in everyday discourse, but more common in the MMORPG gaming context, additional measures must be taken. For words to be applicable for the gaming vocabulary test, they needed to be rare in general language use, while being more common in gaming language. In order to show the rarity of words, Lextutor and the OED were used. When gaming-related words were entered into Lextutor's vocabulary profiler, the words were found to be much less frequent. An example of this is the word *scimitar*, which according to Lextutor is in the 16 000 most common word range. The OED's frequency band is used to further reinforce this notion. Gaming-related words were almost always in frequency band 5 or less, very often in band 4. According to the OED: "Band 4 contains words which occur between 0.1 and 1.0 times per million words in typical modern English usage. Such words are marked by much greater specificity and a wider range of register, regionality, and subject domain than those found in bands 8-5" (Oxford English Dictionary).

To indicate that a rare word is more common in an MMORPG context, collective online resources, such as wikis regarding MMORPGs were utilised. Examples of these are Old School RuneScape Wiki, The RuneScape and Wowpedia. These wikis are similar in style to Wikipedia, the key difference being that the first two focus on the subject matter of the MMORPG RuneScape and the last one focusing on World of Warcraft. MMORPG gamers have been shown to be active consumers and creators of collective online resources such as wikis (Steinkuehler & Duncan 2009). Because MMORPG wikis are used so much in tandem with playing MMORPGs, wikis can provide easily quantifiable information regarding language use. While it would be possible to construct a corpus using data provided in the MMORPG wikis, this was not done during the present study. This is because it is enough in the context of this thesis to know that a generally rare word occurs multiple times in an MMORPG wiki. Furthermore, this thesis focuses more on the vocabulary tests as a whole instead of focusing on individual words and corpora construction.

Two wikis of the most popular MMORPGs, World of Warcraft and RuneScape, were selected. Using wikis of different MMORPGs provides insurance that a gaming word does not

appear in only a single game, but in other games of similar nature too. This is to prevent cases such as the *blurite ore* case that was mentioned in section 2.1 where a gaming word appears exclusively in a specific game, in addition to proving the increase frequency of a word in the game world. World of Warcraft has multiple wikis, the largest of which, called Wowpedia, was selected. Wowpedia includes a very large number of articles, a total of 249 697 during the writing of this thesis. RuneScape, which is divided into two versions: RuneScape and Old School RuneScape, have their own respective wikis: RuneScape Wiki and Old School RuneScape Wiki, which contain 62 516 and 25 959 articles, respectively. RuneScape's wikis will be discussed together as of now, unless a specific point is to be made about one or the other. When comparing World of Warcraft's and RuneScape's wikis, the latter's articles are often over twice as long as the former's. This can partially explain the discrepancy between the number of articles, and why RuneScape is a valid MMORPG to compare to World of Warcraft regardless of the difference in the number of articles in their wikis.

Gaming words were added to the questionnaire based on three criteria. First, a word needed to be markedly rarer in Lextutor, such as the *scimitar* example in the 16 000 most common word categories. Second, the word had to be rare according to the Oxford English Dictionary, most often in frequency band 4. Third, the word had to appear often in the aforementioned MMORPG wikis. A gaming word was categorised as occurring often in Wowpedia, if a search produced more than 5 000 search results. For RuneScape's wikis, over 1 000 search results was deemed sufficient due to the difference in the size of the wikis. It should also be noted that when searching for individual words in these MMORPG wikis, gaming words often yield more search results than everyday words. For example, inputting *stick* in Old School RuneScape Wiki provides less than 700 search results, whereas searching *scimitar* provides over 2500 search results. This is further evidence that using MMORPG wikis is a reliable tool to gather MMORPG gaming words.

This thesis and its data gathering part were done according to and taking into account ethical principles. Since personal information of the participants was not collected during the data gathering part of this thesis, there were few ethical concerns. Data gathering was based on the ongoing consent of the participant, as well as article 6(1) of the general data protection regulation of the European Union. Even though this thesis studied students in schools, all of the participants were of an age at which they could give consent themselves. The participants

were told explicitly that participating would not affect their grade in any manner, and that they could stop participating at any time.

## 4 Results

The results of the conducted study are presented in the following subsections. This section focuses on laying out the results of the data gathering and explaining them, instead of discussing the potential conclusions that can be drawn from the results. The implications of the results and what conclusions can be drawn from them in the context of the research questions of this thesis are provided in the discussion section. First, the total distribution of the data is presented, such as how many of the participants were considered MMORPG gamers, and what their proportion of the whole sample was. Next, the results of the two vocabulary tests are explained individually, starting with the general vocabulary test. Lastly, the picture task is given closer attention to see what type of variation it contains regarding vocabulary test scores between gamers and non-gamers.

### 4.1 Distribution of Gaming Habits in Participants

After conducting the data gathering in three upper secondary schools around Finland Proper, a total of 133 participants (n=133) were found. Participant attrition was very low, which suggests that the chosen method for data gathering was successful and efficient. Only one participant from a total of 134 participants had to be excluded because they did not finish the questionnaire. Furthermore, no participant had intentionally and blatantly done the questionnaire wrong by, for example, only answering with the first option of a multiple-choice question. This resulted in a participant attrition rate of less than 1%. Table 1 below provides a visual representation of how gaming habits of the participants were distributed.

Table 1. Gaming Habits of Participants

Variable	Value	Per cent
Plays Digital Games, Excluding MMORPGs	79	59%
Plays MMORPGs	22	17%
Does not Play Digital Games	32	24%

Table 1 illustrates the total distribution of participants in the context of gaming habits. Variables one and three sum up to the whole sample (n=133), whereas the MMORPG gamer variable represents a subgroup of variable one. Figure 1 below visualises these results:

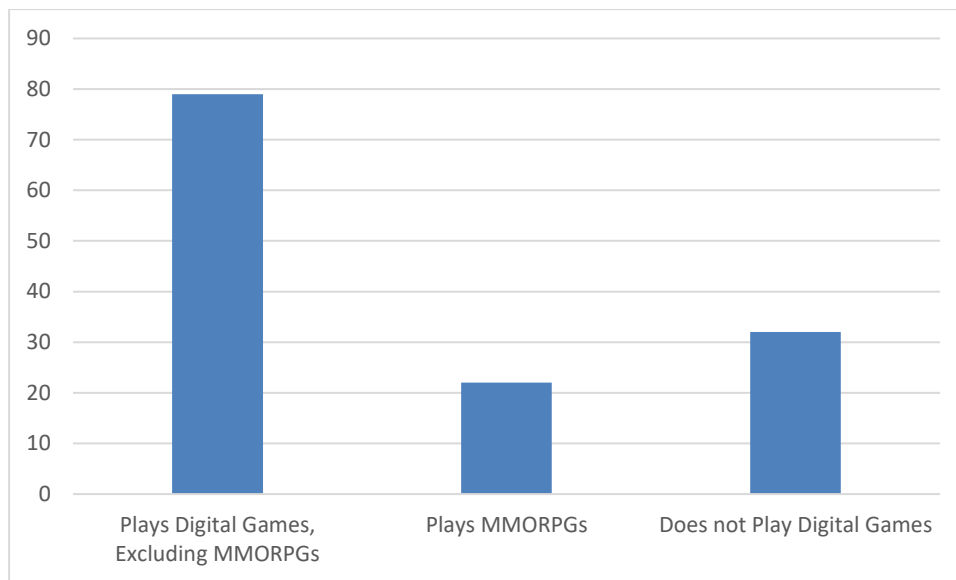


Figure 1. Distribution of Gaming Habits between Participants

Figure 1 shows how much larger the gamers in general group is when compared to MMORPG gamers and non-gamers. It also shows the similarity of the MMORPG gamer group and non-gamer group. Table 1 and Figure 1 show that MMORPG gamers, the group that are focused on in the present study, contain a total of 22 participants ( $n=22$ ), a proportion of 17% of the total sample. Respectively, gamers who play digital games in general represent 76% ( $n=101$ ), while non-gamers represent 24% ( $n=32$ ). In Table 1, however, MMORPG gamers were excluded from gamers in general, which provided a total of 79 participants and 59%. Comparison between the MMORPG gamer and non-gamer groups, which is one of the main purposes of this thesis, is possible due to the similar number of participants in both groups. Although the group that plays digital games generally represents a higher proportion of the sample, it can also be compared to the other two groups to provide insight on whether MMORPGs specifically provide better results in the vocabulary tests or not.

When it comes to frequency and length of gaming, non-gamers provided interesting results. Considering that this group answered that they do not play digital games, it was assumed that their length and frequency of gaming would be zero. However, every single participant that defined themselves as a non-gamer still answered that either their gaming per day or length of gaming in years was more than zero. No participant defined themselves as a non-gamer in addition to informing that they do not play digital games in any amount. This might cause

some inaccuracies when comparing gamers and non-gamers because even the non-gamer group might not truly represent a group that does not and has not played any digital games at all. The reasons for these types of results might be that some participants were reluctant to define themselves as gamers because of the low total amount of gaming that they do, or that they thought that they should answer something other than zero to the questions regarding their gaming habits. Another explanation for this could be that the participants who reported not to play digital games used to play them earlier. However, the questionnaire contained an answer of “I used to play digital games, but not anymore”. Thus, participants who used to play, but do not play anymore would have answered that question instead of answering “I do not play digital games”. The present study conducted the analysis with the non-gamers’ gaming habits left as they are instead of changing all gaming frequency values to zero, if the participant defined themselves as a non-gamer. This approach was chosen because changing the participants’ answers artificially would have provided even more inaccurate results than leaving them as they are.

Frequency and length of gaming were measured using two questions in the general information part of the questionnaire. These were questions seven and eight, which inquired the participant’s total length of gaming in years and daily gaming in hours, respectively. These two values were then made into a single variable by calculating the total time played in days. This was done by utilising the following equation:

$$d = ((y \times 365) \times h) \div 24$$

In this equation days played  $d$  is calculated by multiplying years played  $y$  by 365 and multiplying that value by hours played in a day  $h$ . This value, which provides total hours played, is then divided by 24 to change the value into variable  $d$ , which is days played. For example, a gamer participant has played digital games for three years, and plays two hours per day, so in this case  $y = 3$  and  $h = 2$ . Entering these values to the equation provides  $d = 91$ . This means that, at the moment of the participant’s answer, that specific participant has played digital games for a total of 91 days. Central tendencies and dispersion regarding duration of gaming are provided in Table 2 below.

Table 2 Gaming Habits of Participants in Days Played

Variable	Mean	Std. Deviation	Range
Full Sample (n=133)	75.13	100.10	547.50
Gamers in General (n=101)	81.61	107.10	547.50
Non-Gamers (n=32)	54.56	71.27	380
MMORPG Gamers (n=22)	51.20	47.80	452.10

Table 2 shows a surprisingly low number of days played for MMORPG gamers. Gamers in general have the highest mean of days played with 81.61 days played. MMORPG gamers have a lower mean number of days played with 51.20 days played. In contrast, the MMORPG gamer group has a much lower standard deviation and range than gamers in general. Still, these results suggest that MMORPG gamers reported having played less digital games in total than gamers in general. What makes these results surprising is that MMORPGs tend to be slower paced than other genres of digital games, such as first-person shooters or mobile games, and thus MMORPG gamers often play digital games at an increased rate. However, the results in Table 2 indicate the complete opposite.

## 4.2 General Vocabulary Test

The general vocabulary test, which was used to measure how broad a participant's vocabulary is in a general sense, contained four questions for a total of 30 points. Test 1 question 1 and question 2, T1 Q1 and T1 Q2 in Table 2, had a maximum of ten points, while questions 3 and 4 had a maximum of five points. Table 3 below shows the general vocabulary test's central tendencies and dispersion of all participants as well as gamer, non-gamer and MMORPG groups.

Table 3. Full Results of the General Vocabulary Test



Variable	Mean	Std. Deviation	Range
Full Sample (n=133)			
T1 Q1	4.24	3.33	10
T1 Q2	6.11	2.51	8
T1 Q3	2.98	1.67	5
T1 Q4	2.85	1.22	5
T1 Total	16.18	7.41	26
Gamers in General (n=101)			
T1 Q1	4.02	3.19	10
T1 Q2	6.08	2.49	8
T1 Q3	2.92	1.66	5
T1 Q4	2.81	1.17	5
T1 Total	15.83	7.25	26
Non-Gamers (n=32)			
T1 Q1	4.94	3.71	10
T1 Q2	6.19	2.61	8
T1 Q3	3.19	1.69	5
T1 Q4	2.97	1.38	4
T1 Total	17.28	7.92	26
MMORPG Gamers (n=22)			
T1 Q1	3.59	2.70	10
T1 Q2	5.68	2.59	8
T1 Q3	2.95	1.36	5
T1 Q4	2.91	1.06	3
T1 Total	15.14	6.20	22

When examining the mean scores of the whole general vocabulary test, Table 3 shows that the mean score for the full sample is 16.18 points out of 30. Both the gamer group and MMORPG gamer group scored less than the mean of the full sample, contrary to the hypothesis of this thesis. The present study hypothesised, because of results found in earlier studies, that gamers, and MMORPG gamers in particular, would have an advantage both in the general and gaming vocabulary tests. While these results only are not enough to abandon the hypothesis, it is surprising that Table 3 suggests the complete opposite of what was

hypothesised: MMORPG gamers were the weakest group in the general vocabulary test with a mean score of 15.14, while the non-gamer group performed the best with a mean score of 17.28. In fact, when only examining the mean scores of all questions individually, the non-gamer group outperformed every other group. The implications of these results will be discussed in the following section after the rest of the data have been presented.

Shifting focus from mean score to dispersion provides better results in the context of the MMORPG group. The MMORPG group has the lowest standard deviation from all groups, a total of 6.20 for the whole vocabulary test, and a range of 22. Comparing these results to the non-gamer group's dispersion shows that the same contrast shows with standard deviation and range as with mean scores. Non-gamers have the highest standard deviation and range from other groups, meaning that non-gamers were more likely to have high and low scores, while the MMORPG gamer group had more even scores. This suggests that MMORPG gamers have similar vocabularies generally, while non-gamers have more variation. This is supported by the fact that MMORPGs tend to have similar content compared to watching television, for example. Non-gamers also rated watching movies and series as the most impactful free time activities for learning English, which supports this argument.

### **4.3 Gaming Vocabulary Test**

In contrast to the general vocabulary test, the gaming vocabulary test had five questions instead of four. This was due to one of the questions being a picture recognition and translation task, which was made to answer the third research question of the present study. This picture task is omitted from the general vocabulary test scores to make the maximum score 30, the same as the general vocabulary test. The picture task will be analysed separately in the next subsection. The distribution of the gaming vocabulary test's results are presented in Table 4 below.

Table 4. Full Results of the Gaming Vocabulary Test

Variable	Mean	Std. Deviation	Range
Full Sample (n=133)			
T2 Q1	5.26	2.18	9
T2 Q2	4.83	3.74	10
T2 Q3	3.77	1.52	6
T2 Q4	2.11	1.43	4
T2 Total	15.98	7.51	28
Gamers in General (n=101)			
T2 Q1	5.25	2.13	9
T2 Q2	4.85	3.62	10
T2 Q3	3.86	1.59	6
T2 Q4	2.11	1.37	4
T2 Total	16.07	7.30	28
Non-Gamers (n=32)			
T2 Q1	5.28	2.36	8
T2 Q2	4.78	4.17	10
T2 Q3	3.50	1.27	6
T2 Q4	2.13	1.62	4
T2 Total	15.69	8.26	25
MMORPG Gamers (n=22)			
T2 Q1	5.23	2.20	7
T2 Q2	5.27	3.75	10
T2 Q3	3.91	1.72	5
T2 Q4	2.41	1.40	4
T2 Total	16.82	7.79	23

The results of the gaming vocabulary test are very different to the general vocabulary test. Examining the mean scores of the full test indicate that MMORPG gamers performed the best out of all groups with a mean score of 16.82, with the mean score of all groups being 15.98 points. MMORPG gamers also had the highest mean score in every question other than

question 1, which is the only question below the mean score of the full sample in question 1. Furthermore, MMORPG gamers had the lowest range in every single question as well as the total score. This, in addition to having the highest mean score, indicates that the MMORPG gamer group had fewer low-scoring individuals when compared to the other groups. Although range shows that even some MMORPG gamers answered incorrectly to all items in questions 2 and 4, since the maximum points in them was 10 and 4, respectively. However, the lower range in total score and higher mean score suggest that the MMORPG gamer group did not score extremely low, unlike gamers in general, for example. More detailed analysis of these results are provided in the discussion section, in which inferential analysis is conducted.

#### 4.4 Picture Tasks

The gaming vocabulary test contained a picture recognition and translation task, which were questions 15 and 16 in the questionnaire. The picture recognition task was included in the results of the gaming vocabulary test so that both tests would have a maximum score of 30 for comparison purposes. Questionnaire question 15, which is coded as T2 Q3 in the gaming vocabulary test, contained six pictures of medieval armour and weaponry that were rare English words generally, but more frequent in a gaming context, such as *scimitar* and *halberd*. Questionnaire question 16, which is omitted from the gaming vocabulary test, simply prompted the participant to translate these words into Finnish. The purpose for the inclusion of this task was to find out whether MMORPG gamers have an advantage in recognising and translating these words because of the audiovisual aspects of playing MMORPGs.

Table 5. Full Results of the Picture Recognition and Translation Task

Variable	Mean	Std. Deviation	Range
Full Sample (n=133)			
Recognition	3.77	1.52	6
Translation	2.29	1.11	5
Gamers in General (n=101)			
Recognition	3.86	1.59	6
Translation	2.33	1.05	5
Non-Gamers (n=32)			
Recognition	3.50	1.27	6
Translation	2.19	1.31	5
MMORPG Gamers (n=22)			
Recognition	3.91	1.72	5
Translation	2.50	1.22	4

The results show that there are very minor differences in the mean scores of both the picture recognition and picture translation task for all groups. The full sample had a mean score of 3.77 for the picture recognition task and 2.29 for the translation task. Table 5 illustrates that MMORPG gamers had the highest mean score in both the recognition and translation categories with a mean score of 3.91 and 2.50, respectively. However, the difference between the mean scores of MMORPG gamers and the other groups is minute, since gamers in general had mean scores of 3.86 and 2.33, while non-gamers had 3.50 and 2.19. The low difference in scores between groups indicates that, while there are differences between the groups, the differences are so small that it will be difficult to draw conclusions based on them. This is further discussed in the following section. Regardless, it should be noted that non-gamers were the only group to have lower mean scores than the mean scores of the full sample. In contrast, gamers in general and MMORPG gamers both had mean scores higher than the full sample.

Examining dispersion shows that all groups other than MMORPG gamers had a range of six and five for the recognition task and the translation task. MMORPG gamers had a lower range of five and four, which suggests that MMORPG gamers had less individuals with very low

scores in these tasks. Both tasks had a maximum score of six, which makes MMORPG gamers the only group to not have any individual score zero points in the recognition task. However, MMORPG gamers also had the highest standard deviation in the recognition task, meaning that they still were the group with the most variance in the recognition task.

## 5 Discussion

Now that the results of the study have been presented in the previous section, the meaning and implications of the results can be discussed. This section contains an analysis of the results provided in the previous section in order to answer the present study's research questions and to confirm or reject the hypothesis presented in the introduction section. The hypothesis was that gamers would have an advantage in both the general vocabulary test and the gaming vocabulary test, which would be shown in the vocabulary test results. Next, the results will be analysed in the order of each research question, after which the findings and implications of the entire study are gathered and summarized in the conclusion section.

### 5.1 Comparison of MMORPG Gamers' and non-Gamers' General Vocabulary

Before further analysis of the differences between MMORPG gamers and non-gamers in the context of the general vocabulary test, it should be determined whether a parametric or non-parametric test should be used for comparing the two groups. Normality cannot be assumed especially due to the small size of both the MMORPG group ( $n=22$ ) and non-gamer group ( $n=32$ ). The Shapiro-Wilk test for normality indicated that both groups have normal distribution, since both groups had a  $p$  value of more than 0.05. The MMORPG group had a  $p$  value of 0.448 and the non-gamer group had a value of 0.067. However, since not all data are normally distributed, a non-parametric test is used here as well. This is due to parametric tests assuming normal distribution for all data, which is not the case with the results of this thesis. Additionally, only using one t-test throughout the results of comparison groups instead of two different t-tests is better for the sake of clarity.

The Mann-Whitney U-test was used to compare total and individual question scores of MMORPG gamers and non-gamers in the context of the general vocabulary test. There was no significant difference in the total test scores between MMORPG gamers (median=15,  $n=22$ ), and non-gamers (median= 17,  $n=32$ ) with a U-score of 319.5 and a  $p$  value of 0.566. There was no significant difference in the scores of question 1 between MMORPG gamers (median= 3,  $n=22$ ) and non-gamers (median= 4,  $n=32$ )  $U= 285.5$ ,  $p= 0.238$ . No significant differences were found in question 2 between MMORPG gamers (median= 5.5,  $n=22$ ) and non-gamers (median= 6.5,  $n=32$ )  $U=311$ ,  $p= 0.467$ . Question 3 also had no significant differences between MMORPG gamers (median= 3,  $n=22$ ) and non-gamers (median= 4,

n=32)  $U = 303$ ,  $p = 0.378$ . Lastly, no significant differences were found in question 4 between MMORPG gamers (median= 3, n=22) and non-gamers (median= 3, n=32)  $U = 339.5$ ,  $p = 0.820$ .

Taking all questions into consideration, the results of this thesis suggest that playing MMORPGs has no positive effect in the context of general vocabulary size. This answer's the first research question, which was whether MMORPG gamers have a broader general vocabulary than non-gamers. While no statistically significant results were found, it is still noteworthy that non-gamers performed better than MMORPG gamers, which was opposite of what was hypothesised.

## 5.2 Differences in Gaming Vocabulary

Similarly with the general vocabulary test, analysis of the gaming vocabulary test will begin with a test for normality. The Shapiro-Wilk test for normality was used again, which yielded a  $p$  value of 0.030 for the MMORPG group and 0.027 for the non-gamer group. Thus, the data of the gaming vocabulary test is not normally distributed, and a non-parametric test must be used. For comparing gaming vocabulary test scores between MMORPG gamers and non-gamers, the Mann-Whitney U-test was chosen. This is because the U-test does not assume normal distribution, and it is especially useful for smaller samples (Larson-Hall 2015, 179), which both groups are.

The U-test showed that there was no significant difference in the total scores of the gaming vocabulary test between the MMORPG group (median= 15.5, n=22) and non-gamer group (median= 15, n=32),  $U = 291$ ,  $p = 0.282$ . Comparing the results of the gaming vocabulary test question by question suggests that for question 1 there is no significant difference between the MMORPG group (median= 6, n=22) and non-gamer group (median= 5, n=32),  $U = 348$ ,  $p = 0.943$ . For question 2, no significant difference was found either, MMORPG gamer median= 6 and n=22, non-gamer median= 3.5 and n=32,  $U = 379.5$ ,  $p = 0.622$ . Question 3 had similar results with no significant differences, MMORPG gamer median= 4 and n=22, non-gamer median= 4 and n=32,  $U = 423$ ,  $p = 0.190$ . Lastly, question 4 follows in the same trend with no significant differences, MMORPG median= 2 and n=22, non-gamer median= 2 and n=32,  $U = 387.5$ ,  $p = 0.520$ . These results show that there is no statistically significant difference in gaming vocabulary test scores between MMORPG gamers and non-gamers. This means that



according to the results of the present study, playing MMORPGs does not increase an individual's gaming vocabulary significantly, which is surprising. Because MMORPG gamers encounter words inquired in the gaming vocabulary test at an increased rate when compared to non-gamers, MMORPG gamers were expected to perform significantly better than non-gamers in the gaming vocabulary test. This, however, was not the case, as the results show. MMORPGs and digital games in general do not seem to have as big of an impact on learners' vocabulary than initially expected. It should also be noted that the small size of the groups might have led to inaccuracies with the results, and the results could thus not be applicable to the general population. However, these results still beg the questions of whether digital games themselves affect learners' language development that much, or if the reason for individuals' learning during gaming comes from their conscious output or other reasons than merely gaming.

### 5.3 Temporal Aspects

In addition to the vocabulary tests themselves, this thesis was interested in how duration of gaming affects vocabulary. As was explained earlier in the results section, gaming frequency and length of gaming were combined into a single value, which was days played in total. Total days played is then measured for correlation with the total test scores of both vocabulary tests in order to answer the research question "How does duration of gaming affect vocabulary acquisition?". Because earlier statistical tests examined differences between groups and not the full sample, this section will begin with a test for normality as well. The Shapiro-Wilk test for normality was conducted for variables days played, T1 total and T2 total. The results of the test indicate that none of the three variables are normally distributed with  $p$  values of less than 0.001 for all variables. Thus, Spearman's  $\rho$  was chosen for analysis of correlation between days played and vocabulary test scores. This is because Spearman's  $\rho$  is non-parametric and it measures the correct value, which is correlation.

Spearman's  $\rho$  was measured simultaneously for both T1 total, which refers to the total score of the general vocabulary test, and T2, which refers to the gaming vocabulary test. After testing for correlation using Spearman's  $\rho$ , the following results were found and presented in a correlation matrix.

Table 6. Correlation Matrix for Days Played and Both Vocabulary Tests

	Days Played	T1 Total	T2 Total
Days Played	1.00	0.14	0.19
T1 Total	0.14	1.00	0.76**
T2 Total	0.19*	0.76	1.00

The results of Spearman's  $\rho$  indicate that there is a strong statistically significant positive correlation between the scores of the general vocabulary test and the gaming vocabulary test ( $r= 0.76$ ,  $p=0.001$ ). However, this is not surprising and was to be expected. Having a positive correlation between test scores in two very similar tests is more of a matter of course than a new discovery. However, there is another statistically significant correlation in the correlation matrix, which is days played and T2 total. The results suggest that there is a statistically significant positive correlation between days played and total score of the gaming vocabulary test ( $r= 0.19$ ,  $p=0.025$ ). This distribution is further visualised in the following Figure 1:

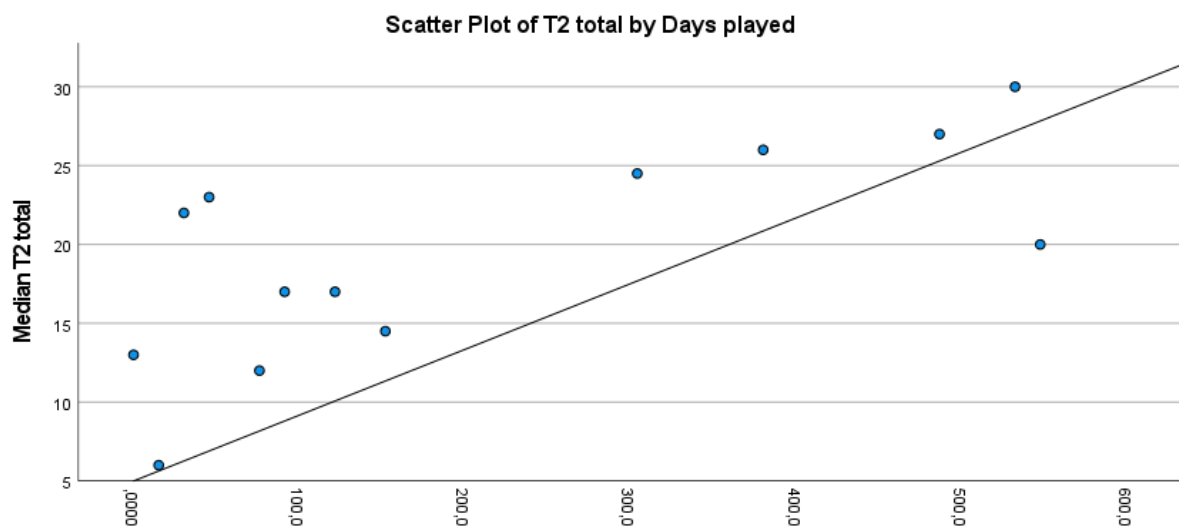


Figure 2. Scatter Plot of T2 Total and Days Played

Figure 2 shows the positive correlation between days played and the total score of the gaming vocabulary test. As can be seen from Figure 2, the more a participant reported playing digital games, the higher their score in the gaming vocabulary test was. While the study groups did not produce significant differences when looking at both vocabulary test scores, examining the full sample shows that the participants who played digital games more performed better on the gaming vocabulary test. The reasons for the lack of statistically significant differences

between MMORPG gamers' and non-gamers' vocabulary test scores could be the low mean number of days played that was displayed by both groups. This was illustrated in Table 2. It should also be noted that playing a lot of digital games did not result in better scores for the general vocabulary test, only the gaming vocabulary test, at least in a statistical sense. These results show that an increase in an individual's digital gaming also increases their access to gaming vocabulary, even if the gaming words are low in frequency in general language use. While these results cannot be used to argue in favour of MMORPGs and their effect on gaming vocabulary, the argument can be made in favour of digital games in general. Furthermore, an individual playing a specific type of digital game does not affect their vocabulary test scores in a meaningful way, which was discovered when comparing MMORPG gamers and non-gamers. The impactful aspect seems to be the amount of gaming instead of gaming or not gaming in itself, or whether a specific genre of game is played.

#### **5.4 Picture Tasks Compared to Other Tasks**

The final point of interest was whether MMORPG gamers had an advantage over non-gamers in recognising and translating gaming words when presented with a picture task. The recognition task, which was coded as T2 Q3, is analysed differently from the translation task, which has been so far omitted from analysis. Earlier analysis in section 5.2 on page 35 showed that there were no significant differences between the picture recognition test scores between MMORPG gamers and non-gamers with a  $p$  value of 0.190. Next, the picture translation task is analysed to determine whether either of the tasks has statistically significant differences between the two study groups. The data of the translation task was tested for normality for both groups, which resulted in a Shapiro-Wilk  $p$  value of 0.028 for the MMORPG gamers group and 0.031 for the non-gamer group, meaning that the data is not normally distributed, and a non-parametric test is the most suitable test.

Similar to and for the same reasons as the analysis of the gaming vocabulary test, the Mann-Whitney U-test was chosen for analysis regarding differences between MMORPG gamers and non-gamers and their picture translation task scores. The results show that there are no statistically significant differences between MMORPG gamers (median=2.5,  $n=22$ ) and non-gamers (median=2,  $n=32$ ) in terms of the picture translation task with a U-score of 402.5 and a  $p$  value of 0.360. Because the results of both the picture recognition and translation task did

not produce statistically significant differences, it can be argued that MMORPG gamers do not have an advantage when compared to non-gamers in the context of recognising and translating gaming words based on pictures. This is an even more surprising finding than the earlier finding of MMORPG gamers not performing better than non-gamers in the gaming vocabulary test because MMORPG gamers are able to see both pictures and names of words in gameplay. Furthermore, gamers encounter these words at an increased rate, which would have supported them having an advantage here. The reasons for these types of results could be the low days played value in the MMORPG gamer group. Because the group does and has not played MMORPGs that much when compared to what digital games gamers in general played, it could explain why MMORPG gamers were unable to recognise and translate gaming words when presented with a picture.

## 5.5 Limitations of the Study

One of the most important limitations of this thesis is the selection of gaming vocabulary test words. Although MMORPG gamers were studied as one whole group, the words for the gaming vocabulary test were selected based on a certain subgenre of MMORPGs, which was fantasy MMORPGs. Although all MMORPGs are fairly similar to one another because of the similar gameplay mechanics and world structure, there are factors that affect what types of words appear in various MMORPGs. For example, an MMORPG based in a fantasy world often contains words referring to medieval weaponry, armour and professions, such as *smithing*, *longsword* and *chainmail*. In contrast, an MMORPG based in a modern or futuristic world contains more modern words, such as *pistol* or *rifle*. The gaming words selected for the gaming vocabulary test in this thesis were all words from fantasy MMORPGs, even though all MMORPG gamers were studied regardless of subgenre. This means that some MMORPG gamers might not have come across the words prompted in the gaming vocabulary test, even though they might have played MMORPGs for an extended period of time.

The second potentially significant limitation is the small sample size of MMORPG gamers (n=22) and non-gamers (n=32). As MMORPGs are only one genre of a vast selection of genres in digital games, it is difficult to obtain a large sample of MMORPG gamers. While analysis was still successful with this sample size, the small sample size could have affected the results.

## 6 Conclusion

In this section, a summary of the entire research is provided, including the research questions and what their answers were, and what conclusions can be drawn from these findings. The implications of the results are also discussed, in addition to establishing questions and suggestions for future research.

The present study set out to find how playing digital games and Massively Multiplayer Online Role-Playing Games (MMORPGs) in particular affect Finnish upper secondary school students' L2 English acquisition with a focus on vocabulary. The research questions that this thesis aimed to answer were “Do MMORPG gamers have a broader vocabulary than non-gamers?”, “How does duration of gaming affect vocabulary acquisition?”, “What differences or similarities do MMORPG gamers and non-gamers have in gaming-specific vocabulary?” and “What differences are there between MMORPG gamers and non-gamers in the context of picture tasks?”. The answers for the research questions were found using a quantitative approach and by utilising a questionnaire-based approach. The data set of the present study consisted of Finnish upper secondary school first year students from three upper secondary schools around Finland Proper. The full size of the sample were 133 participants (n=133). The questionnaire consisted of three parts: a general information gathering part, a general vocabulary test and a gaming vocabulary test. Both vocabulary tests were created based on Paul Nation's Vocabulary Levels Test. The general vocabulary test measured a participant's general vocabulary size overall, while the gaming vocabulary test measured vocabulary size in the context of digital games. The gaming words were defined as words of low frequency in general English use, which were of increased frequency in a digital gaming context. The words were categorised as having an increased frequency in gaming if the word appeared often in MMORPG wikis. Based on the information provided in the general information gathering part, the sample was divided into three groups: Gamers in general (n=101), MMORPG gamers (n=22) and non-gamers (n=32).

The data analysis consisted of presenting the results of the research descriptively, after which the results were analysed inferentially. Frequency and total length of gaming was calculated into a single value, which was total days played. This was done by combining daily gaming in hours and total time played in years into days played in total. Only the data of the general

vocabulary test in the context of MMORPG gamers and non-gamers were normally distributed, which were analysed using Student's independent samples t-test. The rest of the data were not distributed normally, which is why the Mann-Whitney U-test was used for comparing MMORPG gamers and non-gamers in the context of their gaming vocabulary test results and picture recognition and translation task results. Lastly, Spearman's  $\rho$  was used for measuring correlation between days played and both vocabulary test results.

In conclusion, it was found that playing digital games correlated with test scores in the gaming vocabulary test with a  $p$  value of 0.025, meaning that an increase in total days played also increased performance in being able to recognise and translate gaming words. Earlier studies have found that individuals who play digital games have a broader vocabulary than non-gamers (Sylvén 2012, Sundqvist 2009). The results of this thesis suggest that individuals who play digital games have a broader vocabulary due to their knowledge of lower frequency gaming words, rather than them merely having a generally broader vocabulary. These results, however, might not be applicable to the larger population mainly due to the rather small size of the sample ( $n=133$ ). When comparing MMORPG gamers and non-gamers and their performance in the general vocabulary test, non-gamers performed better on average than MMORPG gamers. Question 1 of the general vocabulary test showed statistically significant results in favour of non-gamers. However, since the full test and other questions did not produce the same results, the difference was judged to be due to other factors. Interestingly, comparing gaming vocabulary test results between MMORPG gamers and non-gamers also provided no statistically significant results.

Since the results of this thesis suggest a correlation between playing digital games and gaming vocabulary test scores, more research is needed on the exact nature of what makes a digital gamer's vocabulary broader than a non-gamer's. This study could be repeated quantitatively to see whether these results reflect in a larger sample and whether the results are applicable to the general population. Alternatively, gamers and non-gamers could be studied qualitatively to find out what kind of variation there is in their vocabulary. Another question that merits seeking an answer for in the context of this thesis is whether digital gamers have a broader vocabulary because of acquisition of low frequency words through gaming, or because gamers learn general vocabulary through gaming. Furthermore, the extent of the positive correlation between total days played and gaming vocabulary test scores could be studied. It

would be potentially impactful for the general population to find out whether playing digital games can increase an individual's gaming vocabulary indefinitely, or whether this correlation plateaus at some point, and if it does, where.

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## Appendices

### Appendix 1 The Questionnaire

#### Tietojenkeruu

##### 1. Englannin opiskelun pituus

Kuinka vanha olet?

Minkä ikäisenä aloitit englannin koulussa?

##### 2. Millaiseksi koet englannin taitosi?

- Huono
- Välttävä
- Keskiverto
- Hyvä
- Erinomainen

##### 3. Pelaatko vapaa-ajallasi digitaalisia pelejä (videopelejä)?

- Kyllä
- En
- Pelasin aikaisemmin, mutta en enää

**4. Mitkä vapaa-ajan toiminnot ovat vaikuttaneet englannin oppimiseesi? Aseta järjestykseen siten, että eniten vaikuttanut toiminta tulee ensimmäiseksi.**

Digitaaliset pelit (videopelit)	Valitse ▼
Elokuvien ja sarjojen katselu	Valitse ▼
Kirjojen lukeminen	Valitse ▼
Musiikin kuuntelu	Valitse ▼
Matkustelu	Valitse ▼
Sosiaalinen media	Valitse ▼

**5. Millaisia eli minkä genren digitaalisia pelejä pelaat tai olet pelannut vapaa-ajallasi?**

- MMORPG esim. RuneScape (Massively multiplayer online role-playing games)
- FPS esim. Call of Duty (First person shooter)
- MOBA esim. League of Legends
- Battle Royale esim. Fortnite
- Tactical shooter esim. Counter Strike: Global offensive
- Simulaattori esim. The Sims
- Urheilu esim. NHL
- Mobile esim. Candy Crush
- Joku muu, mikä?
- Jos pelaat jotain peliä, mutta et tiedä genreä, kirjoita se tähän

**6. Listaa tähän digitaalisia pelejä, joita pelaat tai olet pelannut vapaa-ajallasi esim. RuneScape, Counter Strike: Global Offensive, The Sims tai Fortnite. Jos pelaat useampaa peliä, kirjoita ainakin kolme pelatuinta peliäsi siten, että pelatuin peli tulee ensin.**

**7. Kauanko olet pelannut digitaalisia pelejä?**

En ollenkaan

Alle vuoden

2-5 vuotta

Yli viisi vuotta

Joku muu, mikä?

**8. Paljonko pelaat päivässä digitaalisia pelejä?**

En ollenkaan

Alle tunnin

1-3 tuntia

3-5 tuntia

Yli 5 tuntia

Joku muu, mikä?

## Yleinen sanastotesti

### 9. Valitse sana, joka vastaa annettua määritelmää.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
	Threshold	Dread	Swarm	Dank	Exhale	Evade	Tattered	Devour	Maze	Rejoice
a) A group of insects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) To breathe out	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) To feel joy or delight	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) When clothing is torn or ragged	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) A piece of wood or stone that you cross when entering a house	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) A structure designed as a puzzle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g) To swallow or eat greedily	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h) Wet, watery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i) To get away or avoid something	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j) Extreme fear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### 10. Valitse samalta riviltä oikea suomenkielinen käänös sanalle. Yhdellä sanalla on yksi oikea vaihtoehto.

1. Prey	<input type="checkbox"/> Varasto	<input type="checkbox"/> Saalis	<input type="checkbox"/> Pieni	<input type="checkbox"/> Rukoilla
2. Superstition	<input type="checkbox"/> Taikausko	<input type="checkbox"/> Voimakas	<input type="checkbox"/> Tilanne	<input type="checkbox"/> Vakava
3. Grieve	<input type="checkbox"/> Suuri	<input type="checkbox"/> Surra	<input type="checkbox"/> Kehottaa	<input type="checkbox"/> Kirkas
4. Fatigue	<input type="checkbox"/> Yhteinen	<input type="checkbox"/> Erillinen	<input type="checkbox"/> Fiksu	<input type="checkbox"/> Väsymys
5. Blossom	<input type="checkbox"/> Slevä	<input type="checkbox"/> Epämääräinen	<input type="checkbox"/> Kukinta	<input type="checkbox"/> Laulu
6. Nocturnal	<input type="checkbox"/> Nokkia	<input type="checkbox"/> Loikata	<input type="checkbox"/> Turvallinen	<input type="checkbox"/> Yöllinen
7. Solitude	<input type="checkbox"/> Eristyneisyys	<input type="checkbox"/> Valeasu	<input type="checkbox"/> Epäröidä	<input type="checkbox"/> Löytää
8. Trample	<input type="checkbox"/> Raikas	<input type="checkbox"/> Nostaa	<input type="checkbox"/> Talloa	<input type="checkbox"/> Pomppia
9. Deceive	<input type="checkbox"/> Huijata	<input type="checkbox"/> Karata	<input type="checkbox"/> Paljastaa	<input type="checkbox"/> Vangita
10. Fortress	<input type="checkbox"/> Keihäs	<input type="checkbox"/> Fasaani	<input type="checkbox"/> Silta	<input type="checkbox"/> Linnointus

### 11. Kirjoita puuttuva sana englanniksi. Sanan ensimmäiset kirjaimet on annettu vinkkinä.

1. I don't know where I am. I am lo...

2. Even though many people thought he did it, the man was inn.....

3. I am so sorry. Can you please fo..... me?

4. That fallen tree is ho.... from the inside.

5. You are my kn.... in shining armour!

## 12. Käännä suomeksi.

1. Remember

2. Blame

3. Shriek

4. Spark

5. Glimmer

### Pelisanastotesti

13. Valitse samalta riviltä oikea suomenkielinen käänös sanalle. Yhdellä sanalla on yksi oikea vaihtoehto.

- |             |  |                                   |                                  |                                  |
|-------------|--|-----------------------------------|----------------------------------|----------------------------------|
| 1. Staff    | <input checked="" type="checkbox"/> Puukko | <input type="checkbox"/> Keppi    | <input type="checkbox"/> Loitsu  | <input type="checkbox"/> Äänekäs |
| 2. Quest    | <input type="checkbox"/> Velho             | <input type="checkbox"/> Kysymys  | <input type="checkbox"/> Nuoli   | <input type="checkbox"/> Etsintä |
| 3. Slash    | <input type="checkbox"/> Viiltää           | <input type="checkbox"/> Talloa   | <input type="checkbox"/> Kätkeä  | <input type="checkbox"/> Kova    |
| 4. Sentinel | <input type="checkbox"/> Aatelinen         | <input type="checkbox"/> Kurja    | <input type="checkbox"/> Ikuinen | <input type="checkbox"/> Vartija |
| 5. Slay     | <input type="checkbox"/> Mäki              | <input type="checkbox"/> Siivota  | <input type="checkbox"/> Surmata | <input type="checkbox"/> Etsiä   |
| 6. Arcane   | <input type="checkbox"/> Aavistaa          | <input type="checkbox"/> Mystinen | <input type="checkbox"/> Terävä  | <input type="checkbox"/> Kaunis  |
| 7. Wand     | <input type="checkbox"/> Jousipyssy        | <input type="checkbox"/> Vihainen | <input type="checkbox"/> Liekki  | <input type="checkbox"/> Sauva   |
| 8. Tome     | <input type="checkbox"/> Panssari          | <input type="checkbox"/> Tuli     | <input type="checkbox"/> Kirja   | <input type="checkbox"/> Linna   |
| 9. Dungeon  | <input type="checkbox"/> Tyrmä             | <input type="checkbox"/> Pelto    | <input type="checkbox"/> Ryhmä   | <input type="checkbox"/> Miekka  |
| 10. Cutlass | <input type="checkbox"/> Tylsä             | <input type="checkbox"/> Leidi    | <input type="checkbox"/> Viitta  | <input type="checkbox"/> Hukari  |

**14. Valitse sana, joka vastaa annettua määritelmää.**

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
	Cloak	Banner	Dagger	Potion	Ore	Melee	Inventory	Rune	Guild	Anvil
a) A heavy block on which metal can be hammered	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) A group formed for a common cause	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Rocks or earth that contain minerals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) Loose clothing worn over a person's clothes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) A symbol or a flag attached to a pole or a spear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) A selection of items in a person's possession	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g) A small sword or knife used for stabbing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h) A drink that can heal or poison someone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i) Fighting in close range	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j) Writing or letters in an ancient language	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>





**15. Numeroi oikea esine englanninkielisen sanan mukaan.**

Helmet

Mace

Shield

Halberd

Crossbow

Scimitar

**16. Käännä kuvien sanat suomeksi. Tämä tehtävä on tarkoituksella vaikea.**

Helmet

Mace

Shield

Halberd

Crossbow

Scimitar

**17. Käännä englanninkieliset sanat suomeksi. Sanojen ensimmäiset kirjaimet on annettu vinkkinä.**

1. Spear = ke....

2. Sword = mi...

3. Whip = ru....

4. Scythe = vii....



71	16	9	5	1	6	5	1	3	2	4	0	5	1	76	3	7	0	2	5	6	3	1	2	12	16
72	16	9	3	1	6	4	1	3	2	5	0	5	1	76	3	9	4	5	5	2	3	2	1	21	11
73	15	8	3	1	6	3	4	2	5	1	0	5	1	76	4	9	4	5	6	2	3	2	1	22	12
74	15	8	4	1	6	5	2	3	1	4	0	5	1	76	5	5	4	3	5	5	3	2	3	17	16
75	16	9	4	1	3	4	2	5	1	6	0	5	1	76	4	7	1	3	6	10	3	3	4	15	23
76	15	8	4	1	2	5	1	3	6	4	0	5	1	76	2	3	3	1	3	1	1	1	2	9	7
77	16	8	4	0	4	5	1	3	2	6	0	5	1	76	10	7	5	2	7	10	4	2	4	24	25
78	15	8	4	1	3	6	1	5	2	4	0	5	1	76	10	10	4	4	8	8	3	2	4	28	23
79	15	9	4	1	5	4	2	3	1	6	0	5	1	76	1	10	1	2	4	0	0	0	0	14	4
80	16	9	3	1	1	5	2	4	3	6	0	5	1	76	1	7	4	2	3	2	4	2	3	14	12
81	16	9	4	1	6	5	2	4	1	3	1	5	1	76	0	7	2	2	2	1	1	1	0	11	4
82	16	9	5	1	6	3	1	4	2	5	1	5	1	76	3	6	2	2	6	7	6	4	3	13	22
83	16	10	5	1	3	6	5	4	1	2	0	5	1	76	10	10	5	5	7	10	6	4	4	30	27
84	16	8	5	1	3	6	4	5	1	2	0	5	1	76	2	5	2	2	4	2	3	2	0	11	9
85	15	9	2	1	2	6	1	5	4	3	0	5	1	76	3	5	3	2	3	4	4	2	1	13	12
86	16	7	4	1	3	6	2	5	1	4	0	5	1	76	1	4	4	3	2	0	3	1	1	12	6
87	15	9	4	1	4	6	1	5	2	3	1	5	1	76	10	10	3	3	9	10	6	3	2	26	27
88	16	9	4	0	1	6	3	5	2	4	0	5	1	76	1	4	1	3	3	2	2	1	0	9	7
89	16	9	3	1	3	6	1	5	2	4	0	5	1	76	5	6	3	3	4	8	6	3	1	17	19
90	15	9	4	1	3	2	6	4	5	1	0	5	1	76	10	9	5	4	7	10	6	3	4	28	27
91	16	9	4	0	1	4	2	5	3	6	0	5	1	76	1	4	2	1	4	1	2	1	1	8	8
92	16	9	3	1	1	3	6	4	5	2	0	5	1	76	2	3	3	3	5	9	6	2	3	11	23
93	15	9	4	1	2	3	1	4	5	6	0	5	1	76	6	8	5	3	7	5	4	3	4	22	20
94	15	9	4	0	5	4	6	2	3	1	0	5	1	76	7	8	3	4	6	4	4	2	3	22	17
95	16	9	3	1	3	4	6	5	1	2	0	5	0	0	2	7	0	1	5	1	4	2	0	10	10
96	16	9	4	1	3	5	1	4	2	6	0	5	0	0	0	3	1	1	6	0	4	2	0	5	10
97	16	9	4	1	4	6	1	5	2	3	0	5	0	0	2	7	5	3	3	6	4	1	0	17	13
98	16	9	5	1	1	2	6	4	5	3	0	5	0	0	0	2	0	3	3	0	3	2	2	5	8
99	15	8	2	0	2	3	1	5	4	6	0	5	0	0	3	4	1	2	5	0	3	1	2	10	10
100	16	9	5	1	2	3	5	6	1	4	0	5	0	0	1	4	0	3	4	1	2	1	2	8	9
101	16	9	3	1	2	4	3	5	1	6	0	5	0	0	0	4	0	3	3	0	2	1	2	7	7
102	15	10	4	1	6	4	2	3	1	5	1	5	0	0	1	4	1	5	2	0	1	1	2	11	5
103	15	9	4	1	1	4	5	3	6	2	0	5	0	0	3	6	3	3	5	2	4	2	1	15	12
104	16	9	4	0	5	4	3	2	1	6	0	5	0	0	8	10	5	5	4	1	5	5	4	28	14
105	16	9	2	1	5	6	1	2	4	3	0	5	0	0	2	7	1	2	3	1	3	2	1	12	8
106	16	9	4	1	2	6	1	5	3	4	0	5	0	0	9	10	5	5	7	1	1	4	0	29	9
107	16	9	3	1	3	2	6	5	4	1	0	5	0	0	4	4	5	3	5	2	2	2	1	16	10
108	16	9	3	1	4	5	2	3	1	6	1	5	0	0	0	2	0	2	4	1	4	1	1	4	10
109	15	9	3	0	6	2	5	3	4	1	0	5	0	0	2	5	4	2	3	4	2	2	1	13	10
110	15	8	3	1	4	5	6	1	3	2	0	5	0	0	1	2	0	2	1	4	3	3	2	5	10
111	16	9	3	0	1	4	2	3	6	5	0	5	0	0	4	3	1	1	4	0	2	1	1	9	7
112	16	9	2	0	4	3	6	2	5	1	0	5	0	0	0	2	0	2	2	1	3	1	0	4	6
113	16	9	3	0	2	5	4	3	1	6	0	5	0	0	0	2	1	1	4	0	0	0	0	4	4
114	15	9	4	1	3	4	5	2	6	1	0	5	0	0	4	7	4	2	6	6	4	2	3	17	19
115	15	9	4	0	3	5	2	4	1	6	0	5	0	0	4	8	5	4	4	5	3	1	2	21	14
116	15	9	4	1	4	5	1	3	2	6	0	5	0	0	2	7	2	2	7	1	4	2	1	13	13
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119	16	9	3	0	2	5	1	6	3	4	0	5	0	0	2	8	4	2	3	2	3	2	1	16	9
120	16	9	4	1	2	3	6	4	5	1	0	5	0	0	2	6	2	2	2	2	3	2	4	12	11
121	16	8	4	1	5	4	2	3	1	6	1	5	0	0	3	3	2	2	6	3	4	2	2	10	15
122	15	9	2	1	2	6	1	5	3	4	0	5	0	0	0	3	4	1	6	2	6	3	2	8	16
123	16	9	4	1	5	6	1	4	2	3	0	5	2	152	4	6	4	2	5	3	4	3	2	16	14
124	16	9	5	1	6	5	1	4	2	3	0	5	2	152	9	10	2	5	7	8	6	3	4	26	25
125	16	9	4	1	6	3	1	4	2	5	0	5	1	76	1	3	2	2	1	1	3	2	1	8	6
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127	16	9	4	1	4	2	1	3	5	6	0	5	7	532	10	7	5	5	10	10	6	5	4	27	30
128	17	11	3	0	2	4	1	6	3	5	0	5	1	76	4	3	4	5	6	1	4	3	4	16	15
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130	16	9	3	1	2	6	1	5	4	3	0	5	2	152	2	6	4	4	7	6	6	2	1	16	20
131	16	10	4	0	1	5	3	4	2	6	0	5	5	380	9	8	4	3	8	10	4	4	4	24	26
132	17	9	4	1	4	6	5	2	1	3	0	5	5	380	7	6	5	2	7	5	6	4	2	20	20
133	16	9	5	1	5	6	2	3	1	4	0	5	5	380	8	9	3	3	8	10	6	4	4	23	28

### Appendix 3 Finnish Summary

Tämä pro gradu -tutkielma käsittelee digitaalisten pelien vaikutusta englannin kielen opiskelijoiden sanaston laajuuteen. Tarkemmin sanottuna tutkimuksen aiheena on erot ja yhtäläisyydet englannin kielen sanaston laajuudessa suomalaisten lukion ensimmäisen vuoden opiskelijoiden välillä. Vertausryhmät ovat opiskelijat, jotka pelaavat digitaalisia pelejä yleensä, *Massively Multiplayer Online Role-Playing Game* (MMORPG) pelejä pelaavat opiskelijat ja ei-pelaavat opiskelijat. Opiskelijoiden yleisen sanaston erojen lisäksi erityistä huomiota annetaan eroille pelisanastossa. Tutkimus pyrkii vastaamaan seuraaviin kysymyksiin: ”Onko MMORPG-pelaajien sanasto laajempi kuin ei-pelaajien yleisellä tasolla?”, ”Miten pelaamisen pituus ja säännöllisyys vaikuttavat sanaston laajuuteen?”, ”Millaisia eroja MMORPG-pelaajien ja ei-pelaajien välillä on pelisanastossa?” ja ”Millaisia eroja kuvantunnistus ja -kääntämistehtävissä on eri vertailuryhmien välillä?”.

Tutkielman tutkimuskysymyksiin pyrittiin vastaamaan hyödyntämällä kyselypohjaista lähestymistapaa ja kvantitatiivisia metodeja. Data kerättiin sähköisellä kyselylomakkeella, joka oli jaettu kolmeen osioon: yleisten tietojen keruuosioon, yleiseen sanastotestiin ja pelisanastotestiin. Datankeruu suoritettiin sähköisellä Webropol-kyselyllä, jonka avulla dataa oli helppo kerätä ja analysoida tehokkaasti ja turvallisesti. Vaikka kysely tehtiin sähköisesti, data kerättiin vieraillemalla lukioissa, jotta saatiin mahdollisimman monta osallistujaa koulua kohden. Tutkittaviksi kouluiksi valittiin Varsinais-Suomen lukiot, koska tämä alue sisältää riittävän määrän kouluja ja ne ovat melko lähellä toisiaan. Yleisessä tietojenkeruussa osallistujien perustietoja kerättiin, kuten heidän englannin kielen opiskelun pituutta, pelaavatko he digitaalisia pelejä, mitä digitaalisia pelejä he pelaavat, kauanko he ovat pelanneet ja paljonko he pelaavat päivässä. Kysely oli täysin anonyymi, eikä mitään henkilötietoja kerätty valtakunnalliset ja kansainväliset tietosuojalait huomioon ottaen. Yleisessä sanastotestissä mitattiin osallistujien englannin kielen sanaston laajuutta yleisellä tasolla, kun taas pelisanastotestissä selvitettiin englannin kielen sanaston laajuutta digitaalisten pelien näkökulmasta. Seuraavissa kappaleissa käydään läpi teoreettista taustaa, jonka jälkeen tutkimuksen metodit ja materiaalit esitellään. Tämän jälkeen tutkimuksen tulokset esitellään, jonka jälkeen niitä analysoidaan johtopäätöksien vetämisen ja tutkimuskysymyksiin vastaamisen mahdollistamiseksi.

Koska tämä tutkimus keskittyy digitaalisten pelien ja MMORPG-pelien vaikutukseen englannin kielen sanaston laajuuteen, tulisi aluksi määritellä mitä digitaaliset pelit ja MMORPG-pelit ovat. Digitaaliset pelit viittaavat mihin tahansa peliin, jota pelataan elektronisella laitteella, kuten pelikonsolilla tai tietokoneella. Digitaalisia pelejä kutsutaan usein myös videopeleiksi, mutta on olemassa myös digitaalisia pelejä, joissa ei ole videoon liittyvää aspektia eli liikkuvaa kuvaa. Näitä ovat esimerkiksi tekstipelit, joissa on usein kuvia videon sijaan. Tähän termiin liittyy siis kaikki pelit vanhoista Super Mario-peleistä uusimpiin ja suurimpiin peleihin, kuten World of Warcraft tai League of Legends.

Massively Multiplayer Online Role-Playing Game (MMORPG) on digitaalisten pelien genre, joka vaikuttaa aluksi vaikealta ymmärtää pitkän nimensä takia. Kuitenkin genren nimessä kiteytyy lähes kaikki tieto sen tyyppisiin peleihin liittyen. Suomeksi käännettynä MMORPG tarkoittaa massiivisen moninpelistä verkkoroolipeliä. Tämä tarkoittaa, että MMORPG-peleihin liittyy kaksi aspektia: moninpelisyys ja roolipelisyys. Moninpeli viittaa siihen, että useampi pelaaja voi pelata samaa peliä samaan aikaan, kuten esimerkiksi World of Warcraftissa. MMORPG-peleissä kuitenkin pelaaminen tapahtuu usein samassa maailmassa ja ympäristössä kaikilla pelaajilla sen sijaan, että pelaajat jaettaisiin erillisiin ympäristöihin, kuten *matseihin* eli erillisiin peleihin, jossa usein joukkue pelaa toista joukkuetta vastaan. MMORPG-peleissä sadat ja tuhannet pelaajat voivat olla samanaikaisesti samassa paikassa ja olla vuorovaikutuksessa toistensa kanssa. Roolipelillisyyttä viittaa siihen, että MMORPG-peleissä on usein tietynlainen tasosysteemi, jossa pelihahmolla kehitetään erilaisia taitoja ja kykyjä, jotta pääsee korkeammalle tasolle eli *levelille* ja hahmo pystyy avaamaan parempia kykyjä ja sisältöä. Täten hyviä esimerkkejä MMORPG-peleistä ovat esimerkiksi World of Warcraft, Runescape, Guild Wars 2 ja Lost Ark. Nämä tietyt piirteet tekevät MMORPG-peleistä myös samankaltaisia ja helppoja määritellä, mikä tekee niiden tutkimisesta yksinkertaisempaa ja johdonmukaisempaa.

Koska tämä pro gradu -tutkielma tutkii sellaista kielen oppimista, mikä tapahtuu luokkahuoneen ulkopuolella, informaali eli epämuodollinen oppiminen on yksi tärkeimmistä teoreettisista näkökulmista tälle tutkielmalle. Informaalia oppimista käsiteltiin monesta näkökulmasta hyödyntäen esimerkiksi seuraavien tutkijoiden aikaisempia havaintoja informaaliseseen oppimiseen liittyen: Krashen (1984), Schmidt (2001), Long (1981 & 1996), Swain (1995) ja Vygotsky (1978). Tärkeimpänä havaintona tehtiin se, että MMORPG-pelaaja

kokee lähes jokaista informaalisesta oppimiseen liittyvää teoriaa pelaamisen aikana, kuten esimerkiksi Krashenin esittämää ymmärrettävää syötettä (*Comprehensive Input*) pelaajan kuunnellessaan kokeneempaa pelaajaa (Krashen 1984), Swainin ehdottamaa tuotoshypoteesia (*Output Hypothesis*) pelaajan pyrkiessä kysymään kokeneemalta pelaajalta apua esimerkiksi pelissä olevan tehtävän tai ongelman kanssa (Swain 1995) ja Vygotskyn lähikehityksen vyöhykettä (*Zone of Proximal Development*) kokeneemman pelaajan auttaessa vähemmän kokenutta pelaajaa ymmärtämään mitä hänen pitäisi tehdä seuraavaksi pelissä (Vygotsky & Cole 1978).

Tälle tutkielmalle oleellisimpia ja merkityksellisimpiä tutkijoita digitaalisten pelien ja englannin kielen oppimisen näkökulmasta ovat Sylvén ja Sundqvist, jotka ovat aikaisemmissa tutkimuksissaan selvittäneet digitaalisten pelien ja World of Warcraftin vaikutusta englannin kielen sanastoon lähinnä ruotsalaisesta näkökulmasta (Sylvén & Sundqvist 2012, Sundqvist 2009). Heidän tutkimuksissaan on löydetty muun muassa, että pelaamiseen vietetyn ajan ja englannin kielen taitojen välillä olisi positiivinen korrelaatio (Sylvén & Sundqvist 2012, 314). Näiden tutkimusten lisäksi tälle tutkielmalle arvokasta oli Paul Nationin havainnot sanastosta ja sanaston mittaamisesta. Nationin mukaan sanaston oppimiseen liittyy kolme prosessia: huomaaminen, hakeminen ja luova käyttö (*noticing, retrieval, creative use*) (Nation 2013, 107). Tämän perusteella havaittiin myös, että MMORPG-pelien pelaamisen aikana koetaan ja käytetään kaikkia näistä prosesseista. Lisäksi Nationin rakentamaa sanaston tasotestiä (*Vocabulary Levels Test*) käytettiin mallina tämän tutkielman sanastotestejä rakentaessa.

Tutkielman datankeruuta varten tehty kysely rakennettiin siten, että kaikkiin tutkimuskysymyksiin saataisiin vastattua. Yleisessä tietojenkeruussa kysyttiin tarkasti eri kysymyksin, että pelaako osallistuja ylipäättänsä mitään digitaalisia pelejä, millä erotettiin ei-pelaajat pelaajista. Tämän jälkeen kysyttiin kahdessa eri kysymyksessä, että minkä genren pelejä osallistuja pelaa, sekä mitä kaikkia pelejä osallistuja pelaa. Täten saatiin eroteltua MMORPG-pelaajat muista pelaajista. Lisäksi sekä genren, että pelien listaaminen mahdollistettiin, että mahdollisimman tarkka määrä MMORPG-pelaajia saatiin kerättyä. Jotkin osallistujat eivät esimerkiksi osanneet määritellä pelaamaansa peliä MMORPG-peliksi, ja eivät raportoineet pelaavansa MMORPG-pelejä. Kuitenkin nämä osallistujat seuraavassa kysymyksessä listasivat pelaavansa pelejä, jotka määritellään MMORPG-peleiksi aikaisempien kriteerien mukaan. Täten saatiin turvattua mahdollisimman realistinen kuvaus

MMORPG-pelaajien määrästä koko otoksesta. Pelattu aika kysyttiin myös kahtena kysymyksenä: pelaamisen pituutena vuosina ja pelaamisen säännöllisyydestä tunteina päivässä. Nämä kaksi arvoa muutettiin pelattuihin päiviin (*days played*), jolla saatiin selville kuinka paljon osallistuja on pelannut.

Sanastotestien sanat määriteltiin niiden yleisyyden perusteella Nationin sanaston tasotestin mukaisesti. Sanoja lisättiin sanastotestiin siten, että aluksi oli yleisempiä sanoja, jonka jälkeen sanat muuttuivat harvinaisemmiksi. Sanojen yleisyys ja harvinaisuus mitattiin kahdella tavalla: Oxford English Dictionaryn frekvenssinauhalla (*frequency band*) ja Compleat Lexical Tutorin K-skaalalla. Frekvenssinauha laskee kuinka usein sana ilmenee yleisessä englannin kielen käytössä per miljoona sanaa. K-skaala puolestaan laskee 16 000 yleisimmän englannin kielen sanan perusteella mihin kategoriaan sana kuuluu. Esimerkiksi yleiset sanat, kuten *swim* (uida) kuuluisi 1 000 yleisimpään sanaan. Yleisen sanastotestin sanat valittiin yleisyyden ja harvinaisuuden perusteella ilman tarkempaa kontekstia tai genreä. Pelisanastotestin pelisanat puolestaan määriteltiin siten, että niiden piti olla selvästi harvinaisempia frekvenssinauhan ja K-skaalan mukaan, mutta yleisempiä pelikontekstissa. Yleisyys pelikontekstissa määriteltiin siten, että yksittäisen sanan artikkelien määrä kahdessa eri digitaalisen pelin wikissä tarkistettiin. Wikeiksi valittiin The Runescape Wiki, Old School Runescape Wiki ja Wowpedia. Jos sana tuotti selkeästi yli 1 000 osumaa kaikissa wikeissä, sana katsottiin yleisemmäksi pelikontekstissa, vaikka se oli frekvenssinauhan ja K-skaalan mukaan harvinainen englannin kielen käytössä yleisesti.

Yleinen pelisanastotesti rakentui neljästä kysymyksestä, joista korkein mahdollinen pistemäärä oli 30. Kaksi ensimmäistä kysymystä oli monivalintakysymyksiä, joista pystyi saamaan maksimissaan 10 pistettä per kysymys. Kysymyksessä 3 piti kirjoittaa puuttuva englannin kielen sana, jossa vinkkinä oli annettu pari ensimmäistä kirjainta ja lause kontekstiksi. Tästä kysymyksestä pystyi saamaan korkeintaan 5 kysymystä. Neljäntenä ja viimeisenä kysymyksenä oli käännöstehtävä, jossa oli annettu sana englanniksi ja pari ensimmäistä kirjainta suomeksi. Maksimipisteet neljännessä kysymyksestä oli 5 pistettä. Pelisanastotesti puolestaan koostui viidestä kysymyksestä, joista maksimipisteet olivat 36 pistettä. Tämä johtui siitä, että yksi tehtävä oli kuvantunnistus ja -kääntämistehtävä, jonka avulla pyrittiin vastaamaan yhteen tutkimuskysymyksistä. Ensimmäiset kaksi kysymystä olivat jälleen monivalintatehtäviä, joista maksimipisteet olivat 10 per kysymys. Kysymys

kolme oli kuvantunnistustehtävä, jossa annettiin kuusi kuvaa ja ne piti yhdistää annettuihin englannin kielen sanoihin. Tämän jälkeen kysymyksessä neljä nämä englannin kielen sanat piti kääntää. Lopuksi kysymys viisi oli käännöstehtävä, jossa osallistujan piti kääntää neljä englannin kielen sanaa suomeksi siten, että pari ensimmäistä kirjainta oli annettu vinkkinä. Maksimipisteet tästä tehtävästä oli 4. Pelisanastotesti oli muuten hyvin samanlainen kuin yleinen sanastotesti, mutta pelisanastotestin sanat olivat aikaisemmin selitetyjä pelisanoja.

Datankeruun suorittamisen jälkeen saatiin kerättyä kaiken kaikkiaan 133 osallistujaa ( $n=133$ ) kolmesta Varsinais-Suomen lukiosta. Vertailuryhmiin jaettuna pelaajia yleisesti oli 101, ei-pelaajia 32 ja MMORPG-pelaajia 22. Kokonaisluku ylittää 133, koska MMORPG-pelaajat luokiteltiin sekä pelaajiksi yleisesti, että omaksi ryhmäkseen. Koko otannan kokoon nähden pelaajat yleensä edustivat 76 % koko otannasta, ei-pelaajat 24 % ja MMORPG-pelaajat 17 %. Kun koko otannan ja vertailuryhmien yleisen sanastotestin ja pelisanastotestin tuloksia vertailtiin, saatiin yllättäviä tuloksia. Yleisessä sanastotestissä ei-pelaajat suoriutuivat parhaiten kaikista ryhmistä, kun taas MMORPG-pelaajat suoriutuivat huonoiten. Ei-pelaajien pisteiden keskiarvo oli korkeampi, kuin koko otannan keskiarvo. Pelisanastotestissä MMORPG-pelaajat suoriutuivat kaikkein parhaiten, kun taas ei-pelaajat suoriutuivat huonoiten. Tässä tapauksessa MMORPG-pelaajien pisteiden keskiarvo oli korkeampi, kuin koko otannalla yleensä. Nämä tulokset eivät kuitenkaan tuottaneet statistisesti merkittäviä tuloksia, koska erot olivat liian pieniä. MMORPG-pelaajien ja ei-pelaajien yleisen sanastotestin tuloksia vertailtiin Studentin riippumattomien muuttujien t-testillä, joka tuotti statistisesti merkittäviä tuloksia vain ensimmäisen kysymyksen kohdalla. Näiden tuloksien mukaan ei-pelaajat olisivat suoriutuneet merkittävästi paremmin yleisen sanastotestin ensimmäisen kysymyksen kohdalla ( $p=0,009$ ). Kuitenkin muut kysymykset tai testin kokonaispisteet eivät tuottaneet samoja tuloksia, joten tämän eron todettiin joutuvan muista syistä. Koska pelisanastotestin pisteet eivät olleet normaalisti jakautuneita, mitattiin MMORPG-pelaajien ja ei-pelaajien eroja Mann-Whitneyn U-testin avulla. Pelisanastotestin tuloksia vertaillessa statistisesti merkittäviä tuloksia ei saatu kokonaispisteiden eikä yksittäisten kysymysten kohdalla. Näiden tuloksien nojalla todettiin, ettei MMORPG-pelaajien ja ei-pelaajien yleisen sanastotestin ja pelisanastotestin pisteiden välillä ollut merkittäviä eroja. Kuvantunnistus ja -kääntämistehtävien pisteetkään eivät tuottaneet merkittäviä eroja MMORPG-pelaajien ja ei-pelaajien välillä.



Seuraavaksi tutkittiin pelatun ajan (days played) korrelaatiota molempien sanastotestien kokonaispisteiden välillä. Koska data ei ollut normaalisti jakautunut, hyödynnettiin Spearmanin järjestyskorrelaatiokerrointa. Tämä testi sai aikaan statistisesti merkittäviä tuloksia pelattujen päivien (days played) ja pelisanastotestin kokonaispisteiden välillä ( $p=0,025$ ). Näitä tuloksia tarkastellen todettiin, että pelaamisen määrä on tärkein tekijä pelisanaston laajuudessa, eikä esimerkiksi mitä peliä pelaa. Lisäksi arvioitiin, että koska yleinen sanastotesti ei tuottanut samanlaisia tuloksia, digitaalisten pelien pelaajien ja ei-pelaajien sanastojen erot voisivat johtua nimenomaan harvinaisista pelisanoista.