



The Faculty of Arts and Education

MASTER'S THESIS

Study programme: Advanced teacher education for levels 8 - 13	Spring semester, 2024 Open
Author: Jørgen Holth (signatur author)
Supervisor: Torill Irene Hestetraet	
Title of thesis: The English receptive and productive vocabulary size of Norwegian 10 th graders and the influence of extramural English	
Keywords: vocabulary size, receptive vocabulary, productive vocabulary, Extramural English, learner beliefs, lower secondary school	Pages: 72 + attachment/other: 19 Stavanger, 08.05.2024

Acknowledgements

I wish to express my sincere gratitude to my supervisor, Torill Irene Hestetraet. Throughout this process, your guidance and honest feedback have been instrumental for the completion of this thesis. I am truly thankful for your counsel and guidance. Special thanks are also due to the two teachers who found the time in their busy schedule to aid the planning and execution of the data collection. Your help and cooperation were invaluable.

I would also like to thank my friends and family for all the encouragement during the entire writing process. To my parents who were always just a phone call away, and my friends who have made the past years in Stavanger more memorable than I could ever imagine. You have kept my spirits high, and I could not have been without you along the way.

Lastly, I am forever grateful for my partner, Liva. Your patience and support have been second to none.

Abstract

The present thesis is a study of the English vocabulary size of 70 Norwegian 10th grade pupils. The aim was to find the receptive and productive vocabulary size of English learners at lower secondary school. Additional aims were to investigate how exposure to extramural English influences the receptive vocabulary size, as well as analyzing written learner texts to find what characterizes the productive vocabulary size in terms of lexical richness. Moreover, the present thesis also aimed to map learner beliefs concerning vocabulary learning.

For data collection, a mixed methods approach was used, including an online vocabulary size test to find the receptive vocabulary size, the online lexical analysis program VocabProfiler to estimate the productive vocabulary size, and a questionnaire to discover the pupils' exposure to extramural English and their beliefs about vocabulary learning.

The findings show that the average receptive vocabulary size was 7,795 word families, and the average productive vocabulary size was estimated to be 3,386 word families. Furthermore, the findings indicated that exposure to extramural English influences the receptive vocabulary size of L2 learners in a positive manner. In terms of lexical richness, the results showed that pupils who scored a higher vocabulary size showed more lexical variation and made fewer lexical errors. The findings of the questionnaire showed that most of the pupils believe that vocabulary knowledge is important to learn English, and that they believe they learn most of their English vocabulary through extramural English activities.

Table of contents

Acknowledgements	II
Abstract	III
List of abbreviations	VI
List of Figures	VII
List of Tables	VIII
1.0 Introduction	1
1.1 Aim and scope of the study	1
1.2 Thesis structure	2
2.0 Literature review	3
2.1 Introduction	3
2.2 Curriculum about vocabulary	3
2.3 The role of English language in Norway.....	4
2.4 Theoretical background.....	5
2.4.1 Word knowledge	5
2.4.2 Word families	5
2.4.3 Types and tokens.....	7
2.4.4 Receptive and productive vocabulary.....	8
2.4.5 Incidental and intentional language learning	8
2.4.6 Teaching vocabulary in an L2 context	10
2.4.7 Vocabulary and reading	11
2.4.8 Vocabulary and writing	12
2.4.9 Learner beliefs about vocabulary.....	15
2.4.10 Extramural English.....	15
2.5 Relevant research	16
2.5.1 Research on vocabulary size	16
2.5.2 Research on learner beliefs about vocabulary.....	17
2.5.3 Research on extramural English	18
2.6 Conclusion	19
3.0 Methodology	20
3.1 Introduction	20
3.2 Mixed methods research	20
3.3 Informants.....	21
3.4 Receptive Vocabulary Size Test	22
3.4.1 Possible limitations of VST	23
3.5 Productive vocabulary texts, Vocab Profiler	24
3.5.1 Lexical richness.....	26
3.5.2 Task of learner texts	26
3.5.3 Possible limitations of VP	27
3.6 Questionnaire	28
3.6.1 Conducting the questionnaire.....	28
3.6.2 Closed-ended questions.....	29
3.6.3 Multiple-choice	30

3.6.4 Rating scales.....	30
3.6.5 Likert scale.....	31
3.6.6 Open-ended questions.....	32
3.7 Validity and reliability	33
3.8 Ethical considerations	34
4.0 Results	36
4.1 Introduction	36
4.2 Receptive vocabulary size.....	36
4.2.1 Average receptive vocabulary size	36
4.2.2 Individual receptive vocabulary sizes.....	37
4.3 Productive vocabulary size	40
4.3.1 High scoring pupils' vocabulary profile	40
4.3.2 Average scoring pupils' vocabulary profile	42
4.3.3 Low scoring pupils' vocabulary profile.....	45
4.4 Questionnaire findings	47
4.4.1 Extramural English activities	47
4.4.2 Learner beliefs about vocabulary.....	50
4.4.3 Habits	53
4.4.4 Open-ended answers	54
4.4.5 High receptive vocabulary size answers.....	55
4.4.6 Average receptive vocabulary size answers.....	56
4.4.7 Low receptive vocabulary size answers	57
5.0 Discussion	59
5.1 Introduction	59
5.2 Receptive vocabulary size and influence of Extramural English	59
5.3 Productive vocabulary size	62
5.4 Learner beliefs about vocabulary.....	65
6.0 Conclusion.....	68
6.1 Main findings.....	68
6.2 Limitations of the study	69
6.3 Implications for teaching.....	71
6.4 Contributions and suggestions for further research	72
References	73
Appendices	77
Appendix 1.....	77

List of abbreviations

EE	Extramural English
EFL	English as a foreign language
ESL	English as a second language
L1	First language
L2	Second language
LK20	Norwegian Curriculum for Knowledge Promotion 2020
TTR	Type-token ratio
VP	Vocab Profiler
VST	Vocabulary Size Test

List of Figures

FIGURE 1: QUESTIONNAIRE ITEM CONCERNING SOCIAL MEDIA SITES.....	48
FIGURE 2: QUESTIONNAIRE ITEM CONCERNING SOCIAL MEDIA.....	48
FIGURE 3: QUESTIONNAIRE ITEMS CONCERNING TIME SPENT ON ACTIVITIES THAT INCLUDE ENGLISH LANGUAGE.....	49
FIGURE 4: QUESTIONNAIRE ITEMS CONCERNING LEARNER BELIEFS ABOUT VOCABULARY.....	50
FIGURE 5: QUESTIONNAIRE ITEMS CONCERNING LEARNER BELIEFS ABOUT VOCABULARY.....	51
FIGURE 6: QUESTIONNAIRE ITEM CONCERNING LEARNER BELIEFS ABOUT VOCABULARY.	52
FIGURE 7: QUESTIONNAIRE ITEMS CONCERNING HABITS.	53
FIGURE 8: QUESTIONNAIRE ITEMS CONCERNING GLOSSARY TESTS AND QUIZLET.....	54
FIGURE 9: REPORTED TIME SPENT ON EE, PUPILS WITH HIGH RECEPTIVE VOCABULARY SIZE.	56
FIGURE 10: REPORTED TIME SPENT ON EE, PUPILS WITH AVERAGE RECEPTIVE VOCABULARY SIZE.	57
FIGURE 11: REPORTED TIME SPENT ON EE, PUPILS WITH LOW RECEPTIVE VOCABULARY SIZE....	58

List of Tables

TABLE 1: CLASSIFICATION SCHEME OF LEXICAL ERRORS (ENGBER, 1995, P. 146).....	14
TABLE 2: AN EXAMPLE OF AN ANALYSIS DONE BY THE VP PROGRAM OF ONE OF THE PARTICIPANTS.	25
TABLE 3: THE AVERAGE RECEPTIVE VOCABULARY SIZE.....	37
TABLE 4: THE RECEPTIVE VOCABULARY SIZE OF PUPILS WHO SCORED OVER 9500 ON THE VST.	37
TABLE 5: THE RECEPTIVE VOCABULARY SIZES OF PUPILS WHO SCORED BETWEEN 9400 AND 7500 ON THE VST.	38
TABLE 6: THE RECEPTIVE VOCABULARY SIZES OF PUPILS WHO SCORED UNDER 7500 ON THE VST.....	39
TABLE 7: THE AVERAGE PRODUCTIVE VOCABULARY SIZE.....	40
TABLE 8: VOCABULARY PROFILE OF PARTICIPANT B1, WITH RELATED RATIOS AND INDICES.	41
TABLE 9: VOCABULARY PROFILE OF PARTICIPANT B16, WITH RELATED RATIOS AND INDICES. ...	42
TABLE 10: VOCABULARY PROFILE OF PARTICIPANT A17, WITH RELATED RATIOS AND INDICES. .	43
TABLE 11: VOCABULARY PROFILE OF PARTICIPANT B11, WITH RELATED RATIOS AND INDICES...	44
TABLE 12: VOCABULARY PROFILE OF PARTICIPANT A1, WITH RELATED RATIOS AND INDICES. ...	45
TABLE 13: VOCABULARY PROFILE OF PARTICIPANT B4, WITH RELATED RATIOS AND INDICES. ...	46

1.0 Introduction

1.1 Aim and scope of the study

The present thesis aims to investigate the English receptive and productive vocabulary size of Norwegian 10th grade pupils at lower secondary school. Furthermore, the present study aims to explore how extramural English exposure correlates with receptive vocabulary size, as well as providing relevant findings concerning 10th graders learner beliefs about vocabulary learning. The current study aims to contribute to the limited number of previous research on vocabulary size of Norwegian lower secondary school pupils and provide more knowledge of the English receptive and productive vocabulary size of 10th graders.

Vocabulary knowledge is incorporated within the Norwegian curriculum's core elements, competence aims and basic skills for the English subject (LK20, 2019). Hence, it is relevant for teachers to be able to map pupils' vocabulary knowledge, as well as being aware of what level of vocabulary knowledge is needed for different purposes. Nation (2006) estimates that a receptive vocabulary size of 8,000-9,000 word families is needed to comprehend most written texts from a range of genres, in addition to 6,000-7,000 word families for spoken text. According to a study by Sundqvist (2009), exposure to extramural English can positively influence the vocabulary knowledge of English language learners. This finding motivates for further investigation of how extramural English exposure correlates with vocabulary size. When teachers approach vocabulary learning, the pupils' learner beliefs about vocabulary learning are important. Horwitz (1999) argues that learner beliefs affect the learning process of pupils, which makes it essential for teachers to consider what the pupils' learner beliefs are about vocabulary learning.

In terms of data material, a mixed methods approach was employed through the use of an online vocabulary test, learner text analysis and a questionnaire. The participants consisted of 70 pupils from 10th grade at two lower secondary schools. To begin with, the receptive vocabulary sizes was determined using an online vocabulary size test (VST). To estimate productive vocabulary size, written learner texts were analyzed through the use of an online program that performs lexical text analysis, VocabProfiler (VP) Compleat Edition. Lastly, to investigate pupils' exposure to extramural English and their beliefs about vocabulary learning, a questionnaire was distributed to the participants.

The present thesis addresses four research questions:

1. What are the English receptive and productive vocabulary sizes of Norwegian 10th graders?
2. What characterizes their productive vocabulary sizes in terms of lexical richness?
3. How is reported exposure to extramural English reflected in the learners' receptive vocabulary size?
4. What are the 10th grade learner beliefs about vocabulary learning?

1.2 Thesis structure

The thesis consists of six chapters. Chapter one, "Introduction" aims to give an outline of the topic of the study. Chapter two, "Literature review", aims to discuss the theoretical framework within the field of study. The main objective of this chapter is to present relevant theory within the field of vocabulary studies, as well as investigating the place of vocabulary in the Norwegian curriculum. The chapter also includes theory concerning learner beliefs about vocabulary and extramural English, as well as previous relevant research. Chapter three presents the elected methodology and elaborates on the topic of the chosen mixed methods research used in the present study. Chapter four presents the findings of the present study. Chapter five aims to discuss the findings in correlation with relevant theory from the second chapter to be able to answer the research questions. Lastly, chapter six concludes the thesis by discussing the present study's contribution, as well as commenting on the study's limitations, implications for teaching and suggestions for further research.

2.0 Literature review

2.1 Introduction

This chapter will aim to provide a review of the theoretical background for this thesis, as well as present relevant previous research within the field. To begin with, section 2.2 will focus on how vocabulary knowledge is included in the *Norwegian Curriculum for Knowledge Promotion 2020*, within the English subject. Section 2.3 will discuss the role of the English language in Norway. Furthermore, section 2.4 will provide theoretical background by addressing important terms within the research field of vocabulary, as well as reviewing theory about teaching and learning vocabulary, learner beliefs about vocabulary and extramural English. Next, section 2.5 will present previous studies of vocabulary, learner beliefs about vocabulary and the correlation between vocabulary and extramural English, before lastly, a brief summary of the chapter will be included in section 2.6.

2.2 Curriculum about vocabulary

In the Knowledge Promotion 2020, also referred to as LK20, the role of vocabulary knowledge is frequently mentioned, particularly within the English subject curriculum. Vocabulary is specifically referred to within what is considered one of the three core elements of the subject, called “language learning”. This element concerns the development of language awareness and knowledge, the ability to use language learning strategies, as well as learning pronunciation, vocabulary, word structure and syntax to enhance pupils’ ability to understand how English is structured (LK20, 2019). In addition, vocabulary is also mentioned within the “competence aims after year 10” of LK20, where one aim addresses vocabulary specifically. It describes that the learners are expected to be able to “express oneself with fluency and coherence with a varied vocabulary and idiomatic expressions adapted to the purpose, recipient and situation.” With vocabulary being important in communication and the ability to express oneself, the focus on vocabulary is clearly reflected in these two occurrences when specifically mentioned. Furthermore, the role of vocabulary knowledge can also be perceived elsewhere in the Knowledge Promotion 2020.

Although not specifically mentioned elsewhere, it may be assumed that having vocabulary knowledge is implied to be a key feature of several elements of LK20. With the two remaining core elements of LK20 concerning “communication” and “working with texts in English”, it may be argued that vocabulary knowledge is relevant to both. In the core element

“communication”, it is explained how it refers to creating meaning through language and the ability to use the language in both formal and informal settings, valuing how pupils shall use and explore the language to express themselves, both orally and in writing (LK20, 2019). The final core element concerns “working with texts in English”, and vocabulary knowledge is essential when encountering English texts to be able to comprehend them.

Another section of LK20 where the importance of vocabulary knowledge is implied is entitled “basic skills” and addresses the basic skills that pupils are expected to acquire and develop during the course of the English subject. The basic skills include oral skills, writing, reading and digital skills (LK20, 2019). Within the description of all these skills, vocabulary can be acquired by developing oral skills using the spoken language in different situations, producing texts by expressing one’s own language, understanding, and reflecting on content of various types of texts, as well as using digital media and resources to strengthen language learning (LK20, 2019). To be able enhance their competence level within each of these skills, pupils are reliant on simultaneously developing their vocabulary knowledge, further emphasizing the importance of vocabulary knowledge in the English curriculum.

2.3 The role of English language in Norway

When addressing English language learning in Norway, it is important to decide what role the English language has in Norway. Historically, Kachru’s (1992) sociolinguistic profile of English has often been used to try to describe the role of English globally, where three concentric circles represent the functional allocation of English in diverse cultural contexts (Kachru, 1992, p. 356). To begin with, the *inner circle* refers to L1 countries where English is the native language, such as USA and the UK. Next, there is the *outer circle*, which is describes by Kachru (1992, p. 356) as ESL, English as a second language. This circle includes countries such as Nigeria, India, and Bangladesh where English has been an official second language. Lastly, there is the *expanding circle*, which refers to where English is used in EFL contexts, English as a foreign language. Rindal (2020, p. 27) argues that there is some complexity related to placing Norwegian learners of English within these categories. Traditionally, the role of English in Norway has been considered within the EFL category. However, Rindal (2020, p. 28) points to several factors about English in Norway that fits more with ESL status, such as the generally high proficiency level of English, and the role and exposure to English in business, higher education, and social life in Norway. While

Norway does not have the traditional characteristics to have the status of ESL, but still exceeds the typical status of EFL, Rindal (2020, p. 32) argues for the use of the term “L2 English”, referring to English as an *additional language*. Even though ESL and L2 are both abbreviations for “English as a second language”, Rindal (2020, p. 32) emphasizes that they are not synonyms, and that L2 is used to avoid having to reproduce the distinctions of EFL and ESL, as well as not having to use dichotomic terms as “native” and “non-native”. In the present thesis, the term L2 will be used to refer to the role of English in the Norwegian learning context.

2.4 Theoretical background

2.4.1 Word knowledge

The aim of vocabulary research is often to establish what vocabulary knowledge a learner has acquired. When addressing vocabulary knowledge, also referred to as lexical knowledge, it is relevant to first discuss what it entails to know a word. While it would be normal for learners to believe that knowing a word’s meaning and form would be all to knowing a word, it is in fact more complex. Zhong (2018, p. 359) argues that there is a demand for having knowledge of many different aspects to fully know a word. Laufer and Goldstein (2004, p. 400) address the fact that lexical knowledge has often been defined differently by different researchers, and that what it means to know a word has been argued to involve: “A sum of interrelated “subknowledges”, such as knowledge of spoken and written form, morphological knowledge, knowledge of word meaning, collocational and grammatical knowledge, connotative and associational knowledge, and the knowledge of social or other constraints to be observed in the use of a word”.

2.4.2 Word families

All learners constantly encounter situations where different levels of vocabulary size are needed, no matter the size of their own vocabulary. When encountering written or spoken text, a certain amount of vocabulary knowledge is required, depending on the difficulty of the text. When measuring vocabulary, the concept of *word families* is used to get an understanding of how many words a learner comprehends or is able to use. Bauer and Nation (1993, p. 253) define word family as: “A base word and all its derived and inflected forms that can be understood by a learner without having to learn each form separately. So, *watch*, *watches*,

watched and *watching* may all be members of the same word family for a learner with a command of the inflectional suffixes of English”.

Bauer and Nation (1993) further argue that the size of a word family grows as a learner’s knowledge of affixation develops, for the reason that once the base word is known to a learner, being able to comprehend other words within the same word family demands minor effort. Affixation refers to the process of when a bound morpheme is added to a word to create a new one or modify its meaning. For example, by adding the morpheme “un-” before the word “happy”, a new word with a different meaning is created. Therefore, as learners expand their familiarity with different affixations, the size of a word family grows as they would need less effort to learn words that are familiar to the base words they already know.

According to Nation (2022), vocabulary can be divided into three groups according to frequency lists of word families: high-frequency words, mid-frequency words, and low-frequency words. The high-frequency words consist of the most frequent 3,000 word families, such as function words *in*, *for*, and *the*, as well as content words such as *government*, *forests*, and *production* (Nation, 2022, p. 18). Furthermore, Nation (2022, p. 19) describes that the mid-frequency words consist of the next 6,000 word families, from the fourth to the ninth frequency 1,000 inclusive, and represents moderately frequent words. Lastly, low-frequency words consist of the words beyond the first 9,000 most frequent word families, and include technical words and words that rarely occur in common language use, according to Nation (2022, p. 20).

Word families are often used as a tool of measurement to arrive at an understanding of how large a vocabulary size a learner has, or how large a vocabulary size is needed to comprehend a written or spoken text. Nation (2006) conducted a study where he found the vocabulary size needed to understand both written and spoken text, as he aimed to try and find a way of deciding vocabulary learning goals for L2 learners. He excluded methods where the aim would include working out how many words there are in English and using the vocabulary size of native speakers as the goal for L2 speakers, as it was argued that both these methods would be considered too large to be a relevant goal for an L2 learner of English. Instead, the aim was to decide a vocabulary learning goal by finding out how much vocabulary you would need to understand an English newspaper, read a novel, watch a movie, or take part in a conversation.

To measure the vocabulary of such texts, Nation (2006) uses frequency bands of fourteen 1,000-word-family lists, which represent the higher frequency end of learners' vocabulary. By using this method, all the words in each text are divided among the frequency levels of where the different words occur. Nation (2006) uses words such as “*commission, invest and labor*” as examples of words that occur within the first 1,000-word-family list, so if these words occur in a text, they will be registered within the first frequency list. The words that are listed as examples from Nations' first 1,000 frequency band derives from his idea to develop “a fourteen 1,000-word-family list, using data from the British National Corpus, which is a 100-million-token corpus consisting of 90% written text and 10% spoken text” (Nation 2006, p. 62). The main idea behind creating such a list was that they should represent the higher frequency end of a learner's vocabulary. With every word of a text being divided among the lists, this method will give an estimate of how large of a percentage of the text is represented in each of the frequency levels. From this, it is possible to make an estimation of how large a vocabulary is needed to understand the text. Based on a test of vocabulary size with highly educated non-native speakers of English from unpublished research conducted by Nation (2006, p. 60), he argues that to comprehend most written text from a range of genres, a vocabulary of at least 8,000-9,000 word families is needed. This is because a 98% coverage of the text is needed for unassisted comprehension of the text, meaning with a vocabulary of 8,000-9,000 word families, a learner would not be reliant on a dictionary or having to search for word definitions as they dealt with the written text. This also means that only 2% of the words will be unfamiliar, which allows for guessing from context. For spoken text, Nation's (2006) research indicated that a vocabulary size of 6,000-7,000 is needed for comprehension.

2.4.3 Types and tokens

Within the field of vocabulary research, two terms which are extensively used are *types* and *tokens*. These two terms are related to any count of the words in a text, and the distinction between them is widely used to measure language development of both language learners and native speakers (Read, 2000). The count of types in a text refers to the total number of different word types, meaning that all words that are repeated several times are only counted once (Schmitt, 2010). In contrast, tokens refer to the total number of words in a text, meaning that all occurrences of words are counted, no matter how many times specific words may be repeated. Types and tokens can be used to measure lexical diversity in a text by determining the variation in the number of individual types that occur compared to the total number of tokens (Schmitt, 2010). This measure is called the *type-token ratio* (see subsection 2.4.8) and

is found by dividing the number of different types by the total number of tokens in a text. The number that is calculated by the types-token ratio gives a sense of the lexical variation of a text as a greater number would indicate that a wider range of vocabulary has been demonstrated (Schmitt, 2010). However, Schmitt (2010, p. 213) highlights a challenge when using the TTR as it is strongly affected by text length: “As a text gets longer, there is less and less chance for new word types to appear, as a greater percentage of the frequent types have already appeared before. Thus, longer texts tend to have increasingly lower type-token ratios as an artefact of text length alone”. It is therefore important to consider text length when using the TTR to comment on lexical diversity and distinguish any difference in text length and consider how this can affect the result.

2.4.4 Receptive and productive vocabulary

Vocabulary knowledge can be divided into two different categories, receptive and productive. The receptive vocabulary is the vocabulary that is used when reading or listening to written or spoken text (Webb & Nation, 2017, p.33). The research conducted by Nation (2006) focused on finding out what vocabulary is needed to understand written and spoken text. This involves the receptive vocabulary, as it is considered “the ability to recognize the form of a word, perceive its meaning or provide its synonym or translation in a learner’s first language” (Laufer et al. 2004, Webb 2008, Webb 2009, as cited in Zhong, 2018, p. 358). Productive vocabulary, on the other hand, involves the vocabulary that learners are able to use themselves, when creating either written or spoken language (Webb & Nation, 2017, p. 33). Productive vocabulary is often defined as “the ability to retrieve the form and meaning, or to produce the word according to its L1 equivalent” (Laufer et al. 2004, Webb 2008, Webb 2009, as cited in Zhong, 2018, p. 358).

2.4.5 Incidental and intentional language learning

Language learners are reliant on learning vocabulary to be able to communicate in a foreign language, and teachers play a major role in learners’ language development with the goal to promote vocabulary acquisition and development. It can be argued that the importance of vocabulary learning and teaching is reflected in LK20 given its relevance to the curriculum's core elements (see section 2.2). When it comes to teaching vocabulary where the aim may be to promote vocabulary acquisition, the teacher needs to consider *incidental* and *intentional* learning, which is the two ways vocabulary can be taught and learned. According to Schmitt

and Schmitt (2020), incidental learning relates to the vocabulary acquisition that occurs when the attention of the learner is focused on the use of language rather than the learning itself, while intentional learning relates to when the learning occurs through the focused study of words.

Incidental vocabulary learning can occur from a range of inputs, such as from reading, listening and extramural exposure. Schmitt and Schmitt (2020, p. 143) argue that while several factors can affect the extent of vocabulary learning gained from reading, a long line of research relating to the number of exposures necessary to the incremental learning of a word indicates that frequency of exposure is a certain key factor in incidental vocabulary learning. Therefore, teachers may aim to ensure frequent exposure for L2 learners through reading by encouraging activities such as *extensive reading*, which is reading where the goal is that the learner frequently reads with the aim to understand and enjoy reading (Schmitt & Schmitt, 2020, p. 144). Incidental vocabulary learning from listening is not as widely covered as reading in terms of literature, but that does not necessarily reflect how spoken input, such as television programs and movies can promote vocabulary acquisition. The main argument that favors incidental reading over listening concerns the fact that the proportion of low-frequency words in written input is higher than the proportion encountered in television programs and movies (Webb & Nation, 2017, p. 53). Nonetheless, Webb and Nation (2017) argue that the greater amount of time spent listening to spoken input may result to similar encounters with low-frequency words as written input, despite spoken input having a lower proportion than written input. Moreover, with the continuous growth of mobile technology and the role of social media, L2 learners may be exposed to English language through *extramural exposure*. Several types of extramural exposure have been shown to aid incidental vocabulary acquisition, such as gaming, watching television and the use of social media (Schmitt & Schmitt, 2020, p. 153). For L2 learners to be able to acquire vocabulary through incidental learning, the amount of exposure and repeated encounters to English language are a deciding factor. While using both written and spoken input to encourage vocabulary acquisition through incidental learning can be beneficial, large amounts of input is necessary for it to achieve its potential and lead to any notable vocabulary gains (Schmitt & Schmitt, 2020, p. 154).

While there is sizeable potential benefit of vocabulary learning from incidental learning, Schmitt and Schmitt (2020, p. 162) argue that intentional vocabulary learning almost always

results in a greater amount and faster vocabulary acquisition, with a better chance of achieving productive levels of mastery as well as retaining the learned vocabulary. A study by Elgort (2011) investigated the outcomes of intentional learning on vocabulary acquisition in L2 learning and confirmed that it is an effective method, and that the inclusion of intentional learning in L2 programs is well justified. Furthermore, it may be argued that a lot of the responsibility with intentional vocabulary learning lies with the teacher to construct and form good instruction for learners. Schmitt and Schmitt (2020, p. 164) emphasize the necessity to promote systematic treatment of vocabulary to help learners reach their potential, as teachers, syllabus and textbooks tend to not pursue vocabulary learning in any principled manner.

2.4.6 Teaching vocabulary in an L2 context

When the objective is to teach vocabulary to L2 learners, there are several factors' teachers need to be aware of that can aid learners' approach to vocabulary learning, such as their contact with English, their needs, motivation and also balanced learning (Webb & Nation, 2017, p. 132). Furthermore, an L2 learner of English does not have the same exposure to English as an L1 learner would, which initiates more responsibility with the teacher to impact their lexical development. Webb and Nation (2017, p. 132) emphasize that teachers must include plenty of English input inside the classroom, preferably through speaking and writing activities, as well as encourage and familiarize learners with resources outside the classroom where they can learn and practice using vocabulary, such as extensive learning programs and watching L2 television and online videos. Needs and motivation may be closely related when teaching vocabulary to L2 learners. As needs for English may differ for the individual L2 learners, Webb and Nation (2017, p. 132) argue that the teacher should select material that most effectively cater to learners needs to better their chance of expanding their vocabulary knowledge. Similarly, since motivation may vary from learner to learner, it may be beneficial to try to make learners understand the value of vocabulary learning to ignite or maintain motivation. Lastly, finding a balanced vocabulary learning process is important to develop a rich knowledge of words. To balance the vocabulary teaching, focus should be divided into four equally important parts, consisting of learning through (1) meaning-focused input, (2) meaning-focused output, (3) language-focused learning and (4) fluency development (Webb & Nation, 2017, p. 133). These four parts make up Nation's (2007) approach for second language teaching, known as the *Four Strands*, which concerns spending roughly the same amount of time with each strand to ensure a well-balanced course to cover both receptive and productive vocabulary skills (Nation, 2007, p. 8).

The four strands can be used in vocabulary teaching to construct what Nation (2007, p. 2) describes as an appropriate balance of opportunities for learning. Furthermore, Nation (2007, p. 2) argues that every activity in a language course fits into one of these strands, and that the four strands can be seen as long continuous sets of learning conditions that run through the whole language course. The first strand, meaning-focused input, relates to using the language receptively through listening and reading. This strand is mostly covered by incidental learning, and as it is meaning-focused, the attention and interest of the learner should mainly be on understanding or enjoyment from what they listen to and read (Nation, 2007, p. 3). The next strand, meaning-focused output, refers to using language productively through speaking and writing. Webb and Nation (2017, p. 180) argue that productive learning is deemed more difficult as it requires more precise knowledge of form, meaning and use of words than in receptive learning. Language-focused learning involves the intentional learning of language features such as vocabulary, spelling, grammar, and pronunciation (Nation, 2007, p. 6). The last strand is called fluency development, which involves all the four skills of listening, speaking, reading, and writing. This strand should involve activities to help the learners to make use of what they already know, meaning unfamiliar vocabulary should be avoided and learners should deal with largely familiar content (Webb & Nation, 2017, p. 181).

2.4.7 Vocabulary and reading

Vocabulary learning is closely connected to reading, as can be reflected in the two previous subsections in terms of incidental vocabulary learning through reading and the repeated mention of reading within Nation's four strands. Nation (2022, p. 197) suggests that by following the principle of the four strands, a well-balanced reading course should include (1) learning from meaning-focused input in the form of extensive reading, including guessing from context with some glossary or dictionary look-up, (2) language-focused learning in the form of intensive reading, deliberate vocabulary learning using flashcards, and training in reading and vocabulary-learning strategies, and (3) reading fluency development to enrich vocabulary knowledge and develop speed of access to vocabulary through easy extensive reading. Schmitt and Schmitt (2020, p. 144) argue that substantial research has attested the value of extensive reading as a pedagogical tool where it has been shown that vocabulary learning has accrued from reading longer texts over time. However, Nation (2022, p. 198) emphasizes that extensive reading is not a "magic easy fix for language development" as learners would need to do extensive reading over a longer period of time reading large

quantities for several years. Nation (2022, p. 200) favors the use of extensive reading for developing language knowledge as it includes several strengths as a tool. These strengths include allowing learners to learn at their own level instead of having to meet the pace of other learners in the process because it is an individual activity, choosing their own reading materials that fit their interests, and the opportunity for learning to happen outside the classroom.

Not to be confused with extensive reading, intensive reading involves a close deliberate study of shorter texts, and while the aim is to understand the text, the procedures involved focus attention to vocabulary, grammar, and discourse of the text, as well as learning strategies (Nation, 2022, p. 202). Intensive reading can be done in several forms, such as with a teacher guiding a class through a text, learners working in groups or pairs, or individually with the help of a dictionary. A way to conduct intensive reading is with *glossing*. This is a method where learners are given information about unknown words in a text, often preferred by learners in the margin, rather than just after the target word (Schmitt & Schmitt, 2020, p. 148). Nation (2022, p. 217) suggests that research indicates that reading with glossing leads to more vocabulary learning than reading without glosses, as well as having a positive effect on reading comprehension.

Lastly, Nation (2022, p. 205) argues that learners should read texts that contain little to no unknown vocabulary when reading for fluency development. This is justified by the inconveniences that occur with unknown vocabulary, such as slowing down the reading and making it difficult to achieve the fluency needed for pleasurable reading. Schmitt and Schmitt (2020, p. 145) recommend the use of *graded readers*, which research has proved substantial vocabulary learning to have derived from, because the vocabulary load is fine-tuned for the learner's level. Beglar and Hunt (2014, p. 44) found that learners who read simplified graded readers provided significantly better results than texts that were not simplified in terms of reading fluency development, proving that reading easy texts may be optimal for fluency development.

2.4.8 Vocabulary and writing

For learners to be able to express themselves in a written context, vocabulary knowledge is necessary as vocabulary is needed for communication in any form. However, having a wide range of receptive vocabulary knowledge does not necessarily equal proficient productive

vocabulary. Schmitt and Schmitt (2020, p. 197) argue that various research shows that L2 learners face challenges with vocabulary size, word knowledge and lexical fluency when writing. Furthermore, they highlight the complexity of the relationship between vocabulary size and written production, as learners tend to not use their productive knowledge even when they have receptive knowledge of vocabulary. As with other skills such as reading, explicit attention to specific vocabulary words and repetition are key elements to develop vocabulary, word knowledge, and fluency in writing (Schmitt & Schmitt, 2020, p. 199). Schmitt (2010) discusses the relationship between receptive and productive mastery, as he points to there being little research capable of finding at what level receptive vocabulary knowledge enables productive use.

When teaching writing in the classroom, it is important to consider writing activities to promote productive vocabulary learning. In a study of L2 learners' vocabulary use in writing, Lee (2003) found that word comprehension does not automatically predict productive use, and that explicit vocabulary instructions seemed to help learners to convert receptive vocabulary knowledge to productive use in immediate writing tasks. Lee's (2003, p. 551) results indicated that L2 learners need to be shown how to use vocabulary in a production task, how lexical variation affect the quality of writing, and that the use of writing tasks can help learners to think of vocabulary as part of their writing process.

A way to analyze the vocabulary in the written production of learners can be done by measuring the *lexical richness*. This is a collective term that includes measures such as *lexical variation* (or type-token ratio), *lexical density*, and *number of errors*. Type-token ratio (TTR), also called lexical variation, is related to the variation of different words in a text. As described in subsection 2.4.3, the TTR can be used to measure lexical variation in a text by determining the variation in the number of individual types that occur compared to the total number of tokens (Schmitt, 2010). The ratio is found by dividing the number of different types by the total number of tokens. Read (2000, p. 200) refers to this as the "range of expressions" when it comes to writing assessment and argues that it may be reasonable to assume that writers with larger vocabulary knowledge are able to avoid repetition or too much use of synonyms and other kinds of related words.

Read (2000, p. 200) describes lexical density as a characteristic that distinguishes written from spoken text. Lexical density refers to the measure where the number of lexical (or content) words are compared to the number of function words. When this measure was

designed, it was deemed that the words in written texts are often more than 40 percent lexical, in contrast to spoken texts that usually consist of less than 40 percent lexical words. Read (2000, p. 200) explains this by pointing out that the content in written language is usually presented in a more concentrated way than in typical speech. Lexical density can therefore be used as a measure to determine good writing as to whether the language of a text is written with typical written language if it contains a larger portion than 40 percent of content words, or whether it is written with a more typical spoken language that contains a larger portion of grammatical words rather than content words.

Lastly, a low number of errors in terms of word usage in a written text is a lexical feature which may characterize good writing. Read (2000, p. 200) suggests that ESL learners' written texts often contains a variety of vocabulary errors and argues that a possible measure of writing quality is the number of errors that may be found in the text. When assessing lexical errors in a text, there is many different types of errors to consider. Engber (1995) considers two main distinctions in terms of types of lexical errors, each with several subsection. These two types of lexical errors regard *lexical choice* and *lexical form*. Table 1 shows Engber's (1995, p. 146) classification scheme of lexical errors.

Table 1: Classification scheme of lexical errors (Engber, 1995, p. 146)

I. Lexical choice	A. Individual lexical items	1. Incorrect - semantically unrelated	a. It has some <i>meanings</i> to study in the US.
			b. We can help ourselves with <i>doing</i> as international people.
		2. Incorrect - Semantically close	a. They have to <i>come back</i> to Indonesia. (<i>go back</i>)
			b. We can study some <i>strange</i> subject. (<i>unusual</i>)
	B. Combinations	1. Two lexical items	a. Young people can say their <i>ideas</i> .
			b. I will <i>bring to go</i> the development of my country.
2. Phrases		a. We have a <i>lot common</i> . (<i>a lot in common</i>)	
		b. They can dicuss their ideas <i>from the bottom of mind</i> .	
	3. Multiple errors (core lexical item)	a. Who want to have more exactly their major.	
		b. It is being popular year and year	
II. Lexical form	1. Derivational errors	a. There are a lot of <i>confliction</i> between these two countries. (<i>conflicts</i>)	
		b. It keeps the class more <i>activity</i> . (<i>active</i>)	
	2. Verb forms	a. It isn't a good way for <i>looking</i> a job. (<i>looking for</i>).	
		b. I want to <i>make business</i> with foreign companies. (<i>do business</i>).	
	3. Phonetically similar - Semantically unrelated	a. It is difficult to think in the <i>wild</i> horizon. (<i>wide</i>)	
		b. I <i>thing</i> that English will help my country. (<i>think</i>)	
	4. Major spelling errors	a. We have learned how to produce a <i>munifactual</i> machine. (<i>manufactured</i>)	
		b. We can see the road shows <i>stimulously</i> . (<i>simultaneously</i>)	

2.4.9 Learner beliefs about vocabulary

Learner beliefs can be defined as “the conceptions, ideas and opinions learners have about the learning and teaching and language itself” (Kalaja, P., Barcelos, A. M. F., & Aro, M., 2017). The term is often used in research when aiming to find out about what beliefs L2 learners have about given topics. Kalaja et al. (2017) remarks that the initial focus of research and analysis within the field of learner beliefs was about finding out what students believed about L2 learning and teaching. However, the focus later shifted towards finding out how beliefs develop and vary in context.

By analyzing learner beliefs within a group of pupils, it is possible to uncover information about individual attitudes that can be used to find appropriate learning strategies to best help each pupil separately, as well as the group as a unit. Horwitz (1999, p. 558) argues that experiences and actions as language learners are influenced by learner beliefs, accentuating that learners’ own beliefs are affecting their learning process. It is argued by White (1999, p. 443) that learners’ “expectations, which are developed prior to experiences are shaped by their beliefs”. Furthermore, White (1999, p. 444) claims that the expectations that learners make are affecting how they as pupils “react, respond and experience a new environment”. This suggests that learners’ beliefs about different aspects of language learning can influence their experience in language learning and how they ultimately approach the learning process. For instance, if a pupil believes that it is important with repetition and rehearsing of vocabulary to learn a language, it may be assumed that this pupil will expect to be presented with learning methods which emphasize their expectations, while they may reject other methods which do not match their beliefs.

2.4.10 Extramural English

With technological enhancements such as social media, TV and gaming being increasingly more accessible for learners of English, there is a growing chance of pupils being exposed to extramural English. The term Extramural English (EE) can be defined as “the English that learners come in contact with or are involved in outside the walls of the classroom” (Sundqvist & Sylvén, 2016). EE is therefore English that learners come in contact with without the influence of the teacher, and rather activities that are independent of school and education where learners engage with the English language, such as watching TV, playing video games, or reading books. Sundqvist and Sylvén (2016) argue that the initiative for

contact lies with the learner themselves, or occasionally with someone else, such as a friend or a parent.

Even though the initiative often lies with the learner themselves, the motivation for language contact is not necessary for a learning purpose. A term that is highly relevant to EE is “*incidental language learning*” (see subsection 2.4.5), as it refers to “learning without the intent to learn, or as the learning of one thing, e.g., vocabulary, when the learner’s primary objective is to do something else” (Laufer & Hulstijn, 2001, p. 10). Incidental language learning relates to EE as learners are able to learn e.g. vocabulary while engaging in EE activities. Sundqvist and Sylvén (2016) provide several examples of what typical EE activities are, such as watching films and TV series, listening to music, reading books and magazines, surfing English websites, following people on Twitter and Instagram (as well as other social mediums), and playing video/digital games with others or by yourself.

2.5 Relevant research

2.5.1 Research on vocabulary size

Within the field of vocabulary research, there has been conducted several MA studies about vocabulary knowledge. However, the number of studies concerning vocabulary size of L2 pupils appears to be significantly lower.

A recent study by Onyszko (2019) aimed to examine the vocabulary size of Vg1 pupils from an upper secondary school in Norway. The study included 100 students and measured both the receptive and productive vocabulary size, with the goal to discover the average vocabulary size and compare it with the number of words they should be able to understand to perform various activities in English. The results showed that the average receptive vocabulary size was 8,338 word families, while the average productive vocabulary size was 4,769 word families.

Sætevik (2018) conducted a similar study, as he did a cross-sectional study of productive and receptive vocabulary size in 8th and 10th grade at a lower secondary school. The study aimed to investigate the growth of pupils’ vocabulary size between the first and last year of lower secondary school. The results indicated that they would on average learn about 300 new word families each year, as the research estimated that the receptive vocabulary size of the pupils in

8th grade was 6,000 word families on average, while the average receptive vocabulary size of the 10th grade pupils was 6,600 word families. The average productive vocabulary size of both the 8th and 10th grade was estimated to be between 5,500 and 6,000 word families.

Another study, by Skoglund (2006) aimed to investigate the English vocabulary usage of upper secondary pupils in Norway, as well as comparing L2 English learners with L1 pupils to determine whether Norwegian pupils were ready for academic studies involving English. This was done by comparing written vocabulary use of 25 Norwegian pupils to 25 native speakers. The study revealed two main points, with the first being that the gap in written vocabulary skills between Norwegian learners of English and native speakers of English was smaller than what Skoglund (2006) first assumed. On the contrary, the study proved that Norwegian learners of English had a relatively small vocabulary and a lack of vocabulary knowledge. The study highlighted the importance of improving the teaching of vocabulary with the help of further research within the field to improve vocabulary skills.

2.5.2 Research on learner beliefs about vocabulary

There is limited previous research concerning L2 learners' beliefs about vocabulary knowledge and learning. However, Chung and Fung (2023) recently conducted a mixed-methods study with the use of a questionnaire involving 556 ESL students in Hong Kong. The research examined both learners' and teachers' beliefs as well as teachers' classroom practices regarding vocabulary learning and teaching. The findings of the research included that "learners generally perceived vocabulary as at least equally important as the four skills (reading, writing, speaking and listening) and grammar" (Chung & Fung, 2023, p. 284). In line with the preceding findings, most respondents answered that they considered "the acquisition of different aspects of vocabulary knowledge to be important, including the form, meaning, and use" (Chung & Fung, 2023, p. 285). In addition, more than 90% of the learners either "agreed" or "strongly agreed" that the best way to learn a word is to use it. Furthermore, more than half the students considered vocabulary learning to be "difficult but fun and agreed with the importance of dictionary use" (Chung & Fung, 2023, p. 288).

Eide (2010) examined methods of teaching and vocabulary acquisition, as well as investigating how some Norwegian 10th grade pupils and their teachers work with English vocabulary and their attitude towards different aspects of language-learning situations in

class. In a questionnaire with 190 pupil- and 24 teacher responses, it was pointed out that there was a split by gender concerning preferred learning strategies as boys preferred more practical approaches to learning, as movies, music and gaming. The study also revealed that teachers were evaluated to be more important than anything else for the language learning of pupils. The study concluded that Norwegian 10th grade pupils was successful in English in general, with some challenges. An important point was that schools need teachers with a solid English education, and that vocabulary learning should be emphasized even more.

2.5.3 Research on extramural English

Leona et al. (2021) hypothesized that different types of EE exposure predict young English language learners' (YELLs) oral and written English receptive vocabulary knowledge. The research aimed to examine the impact of motivational factors and EE exposure on YELLs' English language performance. The findings suggested that "the contribution of EE exposure and motivational factors to YELLs' vocabulary knowledge depends on learning context", and also indicated that "EE exposure through entertaining media and familiar EE exposure plays a direct role in the vocabulary knowledge of YELLs learning English informally" (Leona et al, 2021, p. 7). It was concluded that teachers should make use of the positive contributions of EE exposure as engagement in EE activities might "resolve limitations of classroom-based formal English learning..." (Leona et al, 2021, p. 11).

In another study, Sundqvist (2009) aimed to study possible effects of EE on oral proficiency and vocabulary of Swedish learners of ESL in 9th grade. In the research, EE exposure was measured by the use of a questionnaire, as well as two language diaries which required the participants to document the amount of time they had spent on seven given EE activities. The reported time spent on EE activities was compared to results of five speaking tests as well as scores they received from two written vocabulary tests. The results of the research indicated that "the total amount of time spent on EE correlated positively and significantly both with learners' level of oral proficiency and size of vocabulary, but that the correlation between EE and vocabulary was stronger and more straightforward than between EE and oral proficiency" (Sundqvist, 2009, p. i). Results also suggested that the type of EE activity mattered as some were more important than others for vocabulary, such as activities that required learners to be more productive (video games, reading) rather than passive (TV, films). As a main implication

Sundqvist (2009, p. 204) argues that “EE is a possible path to progress in English for any learner, regardless of his or her socioeconomic background.”

The findings from both the research of Leona et al. (2021) and Sundqvist (2009) may be used to emphasize the potential benefits that English language learners can gain from the exposure of EE, as it is may be argued that EE activities can help learners’ vocabulary growth.

2.6 Conclusion

This chapter has presented relevant theoretical background to this thesis. It has highlighted the role of vocabulary in the English subject in LK20, as well as drawn attention to theory concerning the teaching and learning of vocabulary. Important terms such as *word families*, *types* and *tokens*, *lexical richness* and *the four strands* has been explained, as well as concepts such as *receptive* and *productive vocabulary*, *learner beliefs* and *extramural English*. The final section of the chapter also pointed to relevant previous research on vocabulary, learner beliefs and extramural English.

3.0 Methodology

3.1 Introduction

This chapter presents the elected research methods for this thesis. To begin with, section 3.2 explains mixed methods research and how it is relevant to this thesis. Section 3.3 describes the informants of research and how they contributed to the thesis anonymously. In section 3.4, the data collection of the receptive vocabulary size is explained with the use of an online vocabulary size test. Section 3.5 presents Vocab Profiler, an online program used to make an estimate of the productive vocabulary size of the participants, based on written learner texts. Next, section 3.6 describes the questionnaire used in the research. Section 3.7 presents the study's validity and reliability. Lastly, section 3.8 explains the ethical considerations.

3.2 Mixed methods research

This thesis can be defined as a mixed methods research, based on the combined use of both quantitative and qualitative research methods as mixed methods research is known for bringing the two together (Newby, 2014, p. 108). For the quantitative part, the present study consists of an online questionnaire and an online vocabulary test which are answered by the 70 participants. The qualitative part consists of in-depth analysis of written learner texts submitted by the participants to determine what characterizes the productive vocabulary sizes.

By electing a mixed methods study, it is possible to take advantage of the strengths of both quantitative and qualitative research methods and reduce the limitations of the two. Watkins and Gioia (2015) address diverse strengths to both quantitative and qualitative research, as well as considering the possible limitations. Watkins and Gioia (2015, p. 6) highlight that quantitative research can generate a broad understanding of a phenomenon from a large group of people while being less time-consuming given the availability of using online surveys. However, quantitative research may lack depth that is sometimes needed to answer questions of a research and may not allow for a deeper understanding or explanation of the quantitative measurement (Watkins & Gioia, 2015). On the other hand, qualitative methods add depth of knowledge about a topic that quantitative data is unable to do, meanwhile it lacks generalizability as the findings are so in-depth since they address a specific sample (Watkins & Gioia, 2015, p. 9). By using mixed methods, the study may be able to generate a broad understanding of a phenomenon as well as getting a deeper apprehension of various samples in the study.

3.3 Informants

The group of participants for the study consisted of 70 pupils from the 10th grade at two lower secondary schools. The data collection contained a written text from each participant to measure productive vocabulary size, an online vocabulary test to measure receptive vocabulary size and an online questionnaire to learn about the learners' beliefs about vocabulary. The 70 pupils were all from 10th grade and in the same age-group with similar background. However, the pupils were from two different schools, with 44 of the pupils divided into two groups from one school and the remaining 26 in one group from the other school. The two groups at the first school were both taught by the same teacher. Despite having participants from different schools, both schools are located in the same national district, which may suggest that the pupils could have somewhat of a similar background despite attending different schools. All pupils had five English lessons over a two-week schedule, with all lessons lasting for 45 minutes. All participants were L2 learners of English, and the study was approved by their responsible teacher.

The data collection was done through an anonymous process by the teacher of each group. To ensure that the participants remained anonymous to the researcher, the teachers responsible for the groups codified the written texts in order to match with a randomized number they were given when answering both the online vocabulary test and questionnaire. This was done to make it possible to compare participants' productive and receptive vocabulary score, as well as their answers to the questionnaire without having to give any form of personal information. Following the guidelines from Sikt (n.d), the Norwegian Agency for Shared Service in Education and Research, research projects where personal data is collected needs to include a notification form as well as an information letter to all participants to give their consent. However, as the present study were able to collect the data without processing any personal data, it was concluded that it was not necessary to include a notification form or information letter.

The sample of this thesis consisted of 70 pupils from two different schools and can be categorized as a convenience sampling. According to Saunders and Townsend (2018), convenience sampling involves choosing participants because of availability or convenient access. This was the case for the present study, as the teachers of the groups accepted to participate. The study also included some extreme case or deviant sampling for the qualitative part of the study. Ritchie, Lewis and Elam (2003) describe extreme case or deviant sampling

as “cases that are chosen because they are unusual or special and therefore potentially enlightening”. This sampling technique was applied to choose specific samples from the participants based on their receptive vocabulary score to get a deeper look into what characterizes the text profiles of low-, average- and high-scoring participants.

3.4 Receptive Vocabulary Size Test

Firstly, the research began with an online vocabulary size test (<https://my.vocabularysize.com/>) to determine an estimation of the learners’ receptive vocabulary size. The Vocabulary Size Test (VST) that the participants completed are based on word frequency lists developed from the British National Corpus (Nation, 2006). A VST is a proficiency measure of the vocabulary size of English learners, either as a second or foreign language (Nguyen & Nation, 2011).

The test consists of 100 questions, where the learners are instructed to look at a given word, an example of the word in use, and lastly choose the meaning that most closely matches the word in question. An example of a question would be that the pupil will see the word “*write*”, in addition to it used in a sentence, such as “Please **write** it here.”. The pupil will then be given four alternative definitions, such as “cut into pieces”, “make words on paper”, “make something better”, and “move to a new place”. The pupil then has to click on the option that most closely matches the word in question. By answering all the questions and completing the vocabulary test, the participant will receive an estimate of their receptive vocabulary size individually, based on their answers. This estimate is what determines the receptive vocabulary size of the learners, and the result that will be used in the thesis. At the end of the test, the participants would submit their score by completing the test, and each result was stored at the page of the researcher to collect. Each student was given a personal code which was constructed by their teacher, to ensure that the participants’ identity was kept anonymous.

In addition, the median correct decision time they used when conducting the test is also included in the results when the participants complete the test. This number shows the median decision time used by the participant when they answered correctly and is included to be able to get a sense of how much time each participant spent when completing the test. A median is the value that is in the middle of a ranked numerical order. The median correct decision time of a participant is found by ranking the times used by the participant when answering

correctly in an ascending order. The decision time is presented in milliseconds, which is one thousandth of a second, e.g. a correct decision time of 5000 ms equals five seconds.

Beglar (2010) aimed to validate the use of VST and concluded that the “test-takers were measured with a high degree of precision”. Furthermore, Beglar (2010) argued that a great value of a VST is that it is likely to be a great tool to measure learners’ progress in vocabulary learning over time.

3.4.1 Possible limitations of VST

Certain limitations to the VST may affect the resulted vocabulary size of the participants, and these will be presented in this section. Firstly, a possible limitation of the VST is related to guessing. Nguyen and Nation (2011) argue that VST is not corrected for guessing, as adjusting for guessing would distort the vocabulary size measure. When developing and validating a Vietnamese bilingual version of the VST, Nguyen and Nation (2011) discovered that the sequencing of the items in the test depended on the range of frequency of occurrences of the words in the BNC. It is possible that this may also affect the resulted vocabulary size in the present study, as the BNC may not be a good reflection of the Norwegian pupils’ English language education and knowledge.

Considering the length of the test, the results may be sensitive to the participants motivation and willingness to spend the necessary time to read and answer each and every question. This may be revealed by reviewing the median correct decision time, as a remarkably low decision time could equal insufficient results. Vocabulary scores with very low median correct decision time, e.g. the scores below 1000 ms can be assumed to have been more or less randomly picked given that the response time has been under 1 second. Given that every question has one correct answer and three incorrect, these pupils will occasionally get correct answers even when they are not considering their given answer. It is however possible that the student would mostly have many errors, and that the times they answered correctly they would guess most of the time within 1000 milliseconds, but it may be argued that it is unlikely given the short amount of time used to answer correctly. The test results who had a median correct decision time under 1000 ms were excluded when calculating the average score, as they may be considered to be unrepresentative scores given the short amount of time they spent answering the questions.

3.5 Productive vocabulary texts, Vocab Profiler

Written learner texts from the 10th grade pupils will be used to help determine the pupils' productive vocabulary size, and to do so, the online program VocabProfiler (VP) Compleat Edition will be used to analyze the texts. VP is a program that performs lexical text analysis which makes it possible to estimate what a learner's productive vocabulary size is. The program, adapted for online use by Tom Cobb, breaks down how many word families are used in a text, and at what frequency level they occur, going from the 1,000 most frequent word families to the 25,000 most frequent word families. VP is based on Laufer and Nation's (1995) Lexical Frequency Profile, which they found to be reliable and valid, which lead to that they could expect learners' vocabulary size in terms of productive use of language (p. 319).


An example of how VP analyzes a text can be seen in Table 2 below. In the analysis by the program, a distinction occurs both at the frequency level where 95% and 98% text coverage are acquired. These distinctions are made to get a sense of what proportion of a text's words that must be known for the text to be understood. Cobb (2018) uses the following description of the 95% line:

If the 95% line is reached with only 1,000 words, this is a fairly basic text. Learners who know only 1,000 word families can make some sense of the text. But if 95% is reached only after 5,000 or 6,000 words, this is a text with complex vocabulary and not for beginners.

It is at these distinctions that the estimated productive vocabulary size is found. Both the 95% line and the 98% line can be used as indicators to determine the vocabulary size, but the results will differ based on what line is chosen. The use of the 98% line comes from Nation's (2006) argument that 98% coverage of a text is needed for unassisted comprehension of the text, while the 95% line is used as Cobb (2018) argues that 95% coverage is a good indicator of text difficulty. In the present study, the 98% line will be used to estimate the learners' vocabulary size. The difference between the estimated vocabulary size when using the different cutting points is visible when comparing the results from Onyszko's (2019) study and Sætevik's (2018) study. While Onyszko's Vg1 pupils had an average productive vocabulary size of 4,769 word families, Sætevik's 10th pupils averaged a productive vocabulary of 5,500-6,000 word families. Although it is possible that the results between two different studies may differ as much as they have in this instance, a reason for the difference

in result can come from the two studies not using the same cutting point when measuring the productive vocabulary size. Using the 95% line will result in a lower estimate than using the 98% line. An example of how VP analyzes a text can be seen in Table 2 below, where one of the participants' texts has been used.

Table 2: An example of an analysis done by the VP program of one of the participants.

Freq. Level	Families (%)	Types (%)	Tokens (%)	Cumul. token (%)
K-1 :	223 (77.2)	294 (77.78)	1109 (89.3)	89.3
K-2 :	42 (14.5)	51 (13.49)	84 (6.8)	96.1
Coverage 95 				
K-3 :	11 (3.8)	11 (2.91)	16 (1.3)	97.4
K-4 :	4 (1.4)	4 (1.06)	4 (0.3)	97.7
K-5 :	5 (1.7)	9 (2.38)	19 (1.5)	99.2
Coverage 98				
K-6 :	2 (0.7)	2 (0.53)	3 (0.2)	99.4
K-7 :				
K-8 :	2 (0.7)	2 (0.53)	2 (0.2)	99.6
K-9 :				
K-10 :				
K-11 :				
K-12 :				
K-13 :				
K-14 :				
K-15 :				
K-16 :				
K-17 :				
K-18 :				
K-19 :				
K-20 :				
K-21 :				
K-22 :				
K-23 :				
K-24 :				
K-25 :				
Off-List:	??	5 (1.32)	5 (0.40)	100.00
Total (unrounded)	289+?	378 (100)	1242 (100)	≈100.00

In the analysis, it is displayed that 99.2% of the text's tokens are covered within the first five frequency levels. The first level, K-1, represents the 1,000 most frequent word families, and it is displayed that 89.3% of the text consists of words from this frequency level. The second level, K-2, represents the following 1,000 most frequent word families. This goes on to the K-25 level, dividing the words among the 25,000 most frequently used word families. In addition, there is a frequency level called "Off-List". This level covers all the remaining

words that are not listed among the K-1 to K-25 frequency levels and are words above the 25,000 most frequently used word families. However, the Off-List level also covers words that are written incorrectly, as they will not be among the list of words within the first 25 frequency levels. This can be a challenge when estimating the productive vocabulary size, as a text with several errors will move the 95% and 98% coverage lines further down as a larger proportion of the text will occur at the Off-List level.

In this thesis, the 98% line is used to estimate the productive vocabulary size of each student. The reason for this choice is based on Nation's (2006) argument that 98% coverage of a text is needed for unassisted comprehension of a text. For instance, by using the analysis from Table 2, it can be determined that the learner's productive vocabulary size is 5,000 word families, as the 98% coverage occurs first after the 5,000-word-family frequency level.

3.5.1 Lexical richness

The present study aims to investigate what characterizes the productive vocabulary size in terms of lexical richness. According to Read (2000, p. 200), lexical richness is a general term used for the characteristics measured by a number of statistics that are able to contribute to make assumptions about vocabulary usage in a written text, such as type-token ratio, lexical density, and number of errors, described in subsection 2.4.8. Read (2000) argues that it may be assumed that good writing can be measured if it has lexical features such as a variety of different words rather than a limited number of words used repetitively, a relatively high percentage of content words as compared to grammatical words, and few if any errors in the use of words. The TTR, lexical density and number of errors will be used to analyze what characterizes the productive vocabulary size in terms of lexical richness.

3.5.2 Task of learner texts

For the written text, the participants were all given the same writing task with the same test conditions and preparation beforehand. The task was not designed by the researcher, but rather a written text they were supposed to write within the English subject schedule with the intent to receive fluent samples of writing under test conditions. Read (2000, p. 198) suggests that the task of a written text has implications for the learners' vocabulary in terms of how tasks vary in demands to their vocabulary resources. Furthermore, Read (2000, p. 199) argues for the importance of considering the suitability of the writing task in relation to the research

aim, and suggests caution of making assumptions of results if they compare written texts that have been made in response to different tasks. In the present study, as all the participants were given the same task related to their written text, there may not be any complications with comparing the results within the text. However, when comparing the results from the present study with other similar studies, the nature of the tasks given between different studies may have implications that needs to be considered before drawing definite conclusion of similarities or differences in results.

3.5.3 Possible limitations of VP

There are some limitations to the VP that is important to take into account that may affect the estimated productive vocabulary size. The first limitation is related to lexical errors, as VP does not correct grammatical or lexical errors. The analysis solely categorizes the words that are included in the written text. This could impact the result as the program may categorize words in the wrong frequency level. To use an example, it was found in the learner text of participant C16, that the vocabulary profile showed that the text included the word “dors”, which is registered in the K24 frequency level. However, based on context, it may be assumed that the pupil intended to write “doors”, which is a K-1 level word. Additionally, words outside of the K25 levels are categorized as Off-List, this may also include words that are not misspelt, such as newly created words that are not included in the wordlists included in the VP.

Another factor that can affect the results is related to the topic and task of the written text. Specific topics or tasks related to the written text may enable the learners to use certain words that they are either given beforehand in preparation or at the time of writing. The VP are unable to analyze to what degree the writer has knowledge of the vocabulary they use. It is therefore important to be cautious and consider the task of the written text before comparing results of written texts with different topics. Furthermore, as written learner texts are almost exclusively written digitally, the pupils often have dictionaries or spell check available which may prevent many spelling errors from occurring which leads to a better result. This may have some implications on the results, as pupils may not have the necessary vocabulary knowledge to use certain words, but with the help of tools as dictionaries and spell checks, they are able to improve their result in the written text without necessarily knowing all the words they use.

3.6 Questionnaire

In this project, an online questionnaire was used to uncover the learners' exposure to extramural English, as well as aiming to map the learners' beliefs about vocabulary learning. 61 of the participants responded to the questionnaire, while nine pupils were absent and unable to complete the questionnaire. The aim with conducting the questionnaire, is to investigate the correlation between the pupils' answers and their receptive vocabulary size. Comparing the answers from the questionnaire to the estimated vocabulary sizes will contribute to discussing the research question of how reported exposure of extramural English is reflected in the learners' receptive vocabulary size.

3.6.1 Conducting the questionnaire

Since English is not the first language of any of the participants, the level of English proficiency will likely differ from pupil to pupil. Therefore, the participants will complete the questionnaire in Norwegian to ensure that everyone understands the questions and to avoid any situations where language becomes an obstacle for understanding what they are to answer. Dörnyei and Taguchi (2010) make the argument that it may occur issues when translating a questionnaire from one language to another, emphasizing how poor translation may negatively affect the questions that a researcher intends to ask and the answers they receive. With this in mind, the translation process of the questionnaire has been done carefully and with assistance from co-workers to ensure that a precise translation has been made.

The questionnaire will be completed anonymously in order to secure that every participant feels security when answering each question, without having to give an answer based on what they feel they either "should" answer or restrain from giving an honest answer. When respondents remain anonymous, they are likely to provide answers that are less self-protective, and presumably more accurate, compared to when they are obligated to reveal their own name (Dörnyei & Taguchi, 2010, p. 17). Instead of revealing their name, each participant will be given an individual code, created and given to them by their teacher, which they insert at the beginning of the questionnaire. The code is used to give the opportunity to link the data from the questionnaire to data coming from the other sources in the study, namely the learner texts and the online vocabulary test which all the participants will complete. By being given an individual code by their teacher, it is possible to compare the

results of the questionnaire, the score of the online vocabulary test, and the analysis of each participants' written text, without any of the pupils having to reveal their identity.

The questionnaire will be conducted electronically using Nettskjema.no, given the many advantages that follows using computers and Internet access to complete a questionnaire. A major benefit of using a web-based questionnaire is the fact that it is highly efficient, both when participants complete the survey and when the researcher examines the data collection. With the proper technology, coding of the answers can happen automatically, thus excluding a time-consuming data-entering stage that would occur if the questionnaire was conducted with pencil and paper (Dörnyei & Taguchi, 2010, p. 70).

3.6.2 Closed-ended questions

The questionnaire will include 35 questions all together, with 34 of the questions being closed-ended questions and one question being open-ended. The difference between closed-ended and open-ended questions relates to the respondents' option to freely express their own individual thoughts when answering a question. When presented with a closed-ended question, the respondent is given ready-made response options to choose from, such as choosing the option most fitting with what they believe is the right answer from their perspective by "encircling or ticking one of them or by putting an "X" in the appropriate slot/box." (Dörnyei & Taguchi, 2010, p. 26). It is further described by Dörnyei and Taguchi (2010) that when using closed-ended questions, the respondents are not required to produce any free writing, and are instead to choose an alternative, regardless of whether their preferred answer to the question is among them. One of the major strengths of using closed-ended questions is the fact that it is a highly efficient method of collecting data from participants. As all the participants are presented with the same response options for each question, this method allows for an easy data collection, given that all the answers from the participants can be added together to be able to analyze the whole group of participants based on their answers. Another key advantage with closed-ended questions is that it does not demand great effort from the respondents. It can be argued that closed-ended questions often are simply put and easily understood, as the participants will not have to try to describe their opinion or try to come up with a personal answer as the response options are given.

3.6.3 Multiple-choice

The first question of the questionnaire stands out, as it is the only item in the questionnaire which is a multiple-choice item. With the first question, the participants are asked to answer which different social media sites they use. They are then given the opportunity to select from a number of listed social media sites. When presented with a multiple-choice item, the respondents are given the opportunity to choose more than one response to the question. The first question is constructed to identify which social media sites the pupils use, and they are given a list of options they can choose from, with the opportunity to choose more than just one alternative. The list of alternatives consists of eight different social media sites, with an additional two alternatives which gives the option of answering “none of the above” and “other social media sites”. The inclusion of the final two alternatives is to ensure that an answer is given rather than left blank, in the event that a pupil either does not use any of the listed social media sites or uses other social media sites that are not included in the list. Dörnyei and Taguchi (2010) argue that certain questions may be potentially so important that it is necessary to include a clarification question following a multiple-choice item that has an option to answer “others”. This is to ensure that the participant has an opportunity to specify their answer. However, in this instance, it is not considered important that the participants specify the social media sites they use outside of the eight that has been listed because the selected social media sites were considered the eight most relevant sites to the study as well as being eight of the more commonly used social media sites. For this reason, a clarification question has not been included. The aim with questioning which social media sites the participants use is to get an understanding of what kind of platforms they spend time on during their spare time.

3.6.4 Rating scales

The following seven questions are closed-ended questions with *rating scales* as response options. Rating scales requires that the respondent assess the question by selecting a specific answer option from a range of organized options on a scale, and the various points on the continuum of the scale indicate different degrees of a certain category (Dörnyei & Taguchi, 2010, p. 26). In the instance of the seven questions in this questionnaire, the category is frequency (e.g., very much → not at all).

An example of one of the seven questions is the following:

“How many hours per day do spend watching TV-series or movies containing English language?”

The respondent is then expected to give an answer by selecting a specific response option from a list of responses which is organized on a scale. The alternative response options for this question would be: “5 hours or more”, “3-4 hours”, “1-2 hours”, “Less than 1 hour”, and “Not at all”.

3.6.5 Likert scale

The majority of the closed-ended questions in the questionnaire consists of the scaling technique called Likert scale. Being one of the most commonly used scaling techniques, 26 of the 35 closed-ended questions in this project include this technique. Dörnyei and Taguchi (2010) describes Likert scale as a method that is “simple, versatile, and reliable”. With Likert scale questions, the respondents are given a set of statements which relates to the given topic of the questionnaire, and the participants are asked to answer to what degree they either agree or disagree with the statements regarding their own opinion. In the present study, the Likert scale questions are ranged from “strongly agree” to “strongly disagree”. Some examples from the questionnaire would be that the participants would be presented with the following statements:

“I learn most of my English vocabulary at school.”

“I have learned most of my English vocabulary at school.”

“I mostly learn new English words by understanding them from an oral context.”

“I learn a lot of English vocabulary when I am not at school.”

The respondents will then have to choose between the following responses: “*strongly agree*”, “*agree*”, “*neither agree nor disagree*”, “*disagree*” and “*strongly disagree*”. The pupils will have to consider which of the alternative responses that best fit their own opinion of the statement.

3.6.6 Open-ended questions

The final question of the questionnaire gives the pupils the opportunity to express their own thoughts as they are presented with one open-ended question. An open-ended question is a question which does not include any response options or alternatives, and rather requires a self-constructed answer and demands more communicative skills from the respondent (Rea & Parker, 2014, p. 53). The open-ended question in the questionnaire consists of the question itself, in addition to a brief elaboration of the question to ensure that the participants understand the question. The question included in the questionnaire is the following:

“In what contexts do you learn new words in English?

Reflect on how you learn new words in English. (Eg. At school, from your family, friends, via social media, by yourself, a mix of some of them or more, etc.)”

Open-ended questions are a unique opportunity for the respondents to provide detailed answers which fail to appear with closed-ended questions where they are restricted to fixed response options. When the participants are provided with freedom, it can result in unique responses that gives the researcher unexpected data in terms of perspectives and ideas that the researcher might not have considered beforehand as it may be difficult to know the range of possible answers and is therefore incapable of providing pre-prepared responses to every question category (Dörnyei & Taguchi, 2010). The respondents can in this way contribute to the research by giving their own opinions on the subject, which can also lead to the researcher gaining a deeper understanding of the reasons behind the participants answers for both the open-ended and the closed-ended questions of the questionnaire.

The questionnaire is limited to only one open-ended question, as including several open-ended questions could be time-consuming when conducting the questionnaire as they take up time when there is a limited time-window to complete the questionnaire. Dörnyei and Taguchi (2010) argue that open-ended questions should appear at the end of a questionnaire, to ensure that they do not discourage people from completing the questionnaire or prevent the participants who may struggle with open-ended questions from answering the other questions. Time can also be challenging when it comes to the analysis of the questionnaire, as the researcher need to read, interpret, and code each response individually, and having several open-ended questions would add to needed time for the data-analysis as they can be difficult to code in a reliable manner (Dörnyei & Taguchi, 2010).

Open-ended questions also demand more from the respondent, so they can be more mentally exhausting as they require effort to think freely and construct a self-made answer. As open-ended questions demand more time from the respondent rather than with close-ended question, the responses from open-ended questions may engender a higher rate of refusal to answer (Rea & Parker, 2014, p. 53). This can result in an irrelevant or superficial response as some participants might care more about finishing the question fast rather than giving a true response. Furthermore, it is possible that participants tend to struggle to formulate their own thoughts in writing. Rea and Parker (2014, p. 53) argue that open-ended questions may lead to answers that are either hard to interpret or otherwise incoherent as a result of the respondents' ability to express themselves. Open-ended questions are open for interpretation from the respondents, and different respondents might interpret an open-ended question differently. This could lead to inconsistent responses and subjective interpretations or unrelated answers, making it challenging for the researcher to ensure consistency in the data.

3.7 Validity and reliability

It is essential that a study is conducted in a valid and reliable manner to be able to trust the potential findings from it. Dörnyei (2007, p. 50) argues that reliability indicates how the selected measurement instruments and procedures may give consistent results in the given context. According to Bachmann (2004, p. 726), validity relates to the meaningfulness of the interpretations based on the results, as well as to what extent these interpretations generalize beyond the research study.

To ensure validity, precautions were made to avoid the most salient validity threats presented by Dörnyei (2007, p. 53). The first threat concerns social desirability bias, which is the case where participants may desire to meet certain expectations and may over-report desirable attitudes and underreport on attitudes that are less respected. This threat is highly relevant to the questionnaire, as pupils could adjust their answer to what they believe their teacher would want them to answer, such as if a pupil believes that the teacher want pupils to read English books outside of school, they may answer that they often read English books outside of school in the questionnaire, even though this may not be the case. To minimize or avoid this threat, the participants were informed that their answers would be anonymous, the teacher would not view the answers, and it would have no effect on their grade in the subject.

Another threat concerning research with several sets of data as in the present study, is subject dropout. Dörnyei (2007, p. 53) argues that this is a serious concern as it may reduce the sample size of participants with a complete data set. In the present research, all participants were measured through three sets of data, including the questionnaire, written texts and the VST. The threat of subject dropout was reduced by the flexibility of each data set. If pupils were absent when the questionnaire and VST were conducted in class, they had the chance to do it later when they were present. In addition, the written texts were from an obligatory task, which ensured that as many texts as possible were collected.

When measuring vocabulary, Schmitt (2010, p. 181) argues that the complex nature of vocabulary knowledge dictates that any particular test would be severely limited as a criterion measure, as different kind of vocabulary tests measure different kind of vocabulary knowledge. In the present study, two different kinds of programs are used to measure vocabulary, the VP for productive vocabulary, and the VST for receptive vocabulary. Even though VP and VST has certain limitations (see subsection 3.4.1 and 3.5.3), it may be argued that both programs are valid to use given the expanded testing in previous research by established researchers, and it can be assumed that the results they generate will not be invalid for any fault of the programs.

3.8 Ethical considerations

As social research – including research in education - concerns the lives of people in the social world, ethical issues are inevitably involved (Dörnyei (2007, p. 63). The researcher must cautiously consider several ethical issues, such as data collection methods and anonymity. Concerning ethical issues, there are several guidelines that must be taken into account when conducting a study of pupils at lower secondary school level. Following the guidelines from Sikt (n.d), research projects where personal data is collected needs to include a notification form as well as an information letter to all participants to give their consent. However, as the present study were able to collect the data without processing any personal data, it was concluded that it was not necessary to include a notification form or information letter.

In the case where the researcher process data that is sensitive to the participants identity, the researcher is obligated to provide information to the people whose personal data are collected (Sikt, n.d). In cooperation with the participants' teacher, the identity of the participants was always hidden from the researcher and the participants remained anonymous. To be able to ensure the pupils anonymity, no questions were asked in the questionnaire that could reveal any information that can be linked to a person, such as name, e-mail address/IP address or any other personal information. Additionally, at the beginning of the questionnaire, the participants were reminded that they were expected not to give any personal information. The participants were given numbered codes by their teachers to be able to link the results from the questionnaire, the receptive vocabulary test, and the productive results. Thus, the present study was able to compare individual results while the participants remained completely anonymous.

4.0 Results

4.1 Introduction

This chapter will present the results of the present study. Section 4.2 will present the resulted receptive vocabulary sizes of the participants based on the VST. Next, in section 4.3, individual text profiles of participants with high-, average- and low receptive vocabulary scores will be analyzed to find what characterizes their productive vocabulary sizes. Furthermore, the questionnaire findings are presented in section 4.4, with the aim to examine how the reported exposure to EE is reflected in the learners' receptive vocabulary size, as well as finding the learner beliefs about vocabulary.

4.2 Receptive vocabulary size

In this section, the receptive vocabulary sizes of the pupils are presented. Each participant received a score of how many word families they know based on their answers on the Vocabulary Size test, which represents their receptive vocabulary size. In addition, the median correct decision time they used when conducting the test is also presented. The decision time is presented in milliseconds, which is one thousandth of a second, e.g. a correct decision time of 5000 ms equals five seconds. The test results who had a median correct decision time under 1000 ms were excluded when calculating the average score, as they may be considered to be unrepresentative scores given the short amount of time they spent answering the questions.

4.2.1 Average receptive vocabulary size

Table 3 shows the average receptive vocabulary size and median correct decision time of all participants. The average receptive vocabulary size was 7,795 word families, and the average median correct decision time was 6170 ms. The highest score within all the groups was 14,200 word families, and a median correct decision time of 8918 ms. The lowest receptive vocabulary size was 4,200 word families, and a median correct decision time of 5410 ms.

Table 3: The average receptive vocabulary size.

	Word families	Median correct decision time (ms)
Average:	7795	6170
Max:	14200	8918
Min:	4200	5410

4.2.2 Individual receptive vocabulary sizes

In tables 4, 5, and 6, all the receptive vocabulary size scores are presented. The scores are divided by descending order, grouped by “scores over 9,500”, “scores between 9400-7500”, and “scores under 7500”. The average receptive vocabulary size within these groupings has no importance as a result, so it has not been included. However, the average median correct decision time has been included, as it may indicate the difference in time spent between the pupils with higher- and the pupils with lower receptive vocabulary scores.

In Table 4, the receptive vocabulary size, as well as the median correct decision time are presented of the nine participants who scored a receptive vocabulary size of 9,500 word families or higher. Six pupils had a receptive vocabulary size over 10,000 word families, with the highest being 14,200. The average median correct decision time of these nine pupils was 6083 ms, not far from the combined average of 6170 ms, with only 87 ms dividing the two.

Table 4: The receptive vocabulary size of pupils who scored over 9500 on the VST.

Participant	Word families	Median correct decision time (ms)
B1	14200	6347
B16	12700	5310
B23	12200	4129
B5	10700	7658
B23	10600	6732
B21	10200	5604
B22	9700	5895
C20	9600	6306
B12	9500	6767
Average:		6083

In Table 5, the scores of the participants who had a receptive vocabulary size between 9,400 and 7,500 are presented. 30 pupils were included within this range, with the average median correct decision time being 6475 ms. As well as the previous grouping, this group is fairly close to the combined average median of 6170, so there is seemingly little that divides the high- and average- scorers in terms of time spent when answering correctly.

Table 5: The receptive vocabulary sizes of pupils who scored between 9400 and 7500 on the VST.

Participant	Word families	Median correct decision time (ms)
A12	9300	5209
A5	9100	6061
B14	9000	7167
A6	9000	6846
C6	8800	7953
B25	8700	6623
C14	8600	7323
A9	8600	5612
C25	8600	3695
C22	8400	6833
B3	8400	6356
C8	8400	6770
B19	8300	7440
A4	8300	5273
C4	8200	7245
C23	8100	7550
A14	8100	6429
C2	8100	4645
A2	8000	7546
A8	8000	8918
A17	7800	6784
C13	7800	6090
C12	7800	5355
B11	7800	5313
B26	7700	8217
A10	7700	7102
C1	7500	7088
C11	7500	6954
C3	7500	4994
B10	7500	4870
Average:		6475

Table 6 presents the scores of the pupils who had a receptive vocabulary under 7,500 word families. The remaining 31 pupils were included in this range. However, four of these may be considered insufficient scores given the remarkably low median decision time of participants B6, B24, C26 and A3. These pupils had a median below 1000, which arguably would not leave enough time to even read the question. Therefore, it may be argued that these scores may not be representative of the real receptive vocabulary size of these participants, as their results could be different if they had spent more time to answer each question. These participants' scores are excluded from consideration in the results and their scores are not included in either of the calculated averages of receptive vocabulary size or median correct decision time. The lowest counting score is then 4,200 word families, with the average median time being close to one second below the combined average.

Table 6: The receptive vocabulary sizes of pupils who scored under 7500 on the VST.

Participant	Word families	Median correct decision time (ms)
C17	7400	7447
A7	7400	5712
A11	7300	6497
C7	7200	6173
A15	7200	5984
C9	7200	5346
C18	7100	7794
B17	7100	6439
B8	6900	6967
C24	6900	4443
C19	6600	5831
B18	6500	7298
C21	6400	6564
A16	6400	4859
B9	6300	5903
B27	6200	5633
C10	6100	6095
C15	6100	3919
C16	6100	6043
B20	5800	6102
B15	5300	6923
A13	5300	5720
B7	5200	6492
C5	5100	3891
B13	4700	3627
B6	4700*	839*
A1	4500	5092
B4	4200	5410
B24	4000*	110*
C26	3900*	97*
A3	3400*	142*
Average:		5251

4.3 Productive vocabulary size

In the following sections, individual text profiles of high-, average- and low-scoring participants from the VST will be presented. The texts are selected based on who had a high-, average-, and low score on the VST to closer examine what characterizes the different text profiles. In Table 7 below, the average estimated productive vocabulary size of all 70 participants are presented, as well as the highest and lowest achieved score. The average estimated vocabulary size of all the participants was 3,386 word families. Two texts are selected within each category, and the selected learner texts for high, average, and low scoring profiles are B1, B16, A17, B11, B4 and A1, respectively.

Table 7: The average productive vocabulary size.

	Productive vocabulary size
Average:	3386
Max:	5000
Min:	2000

4.3.1 High scoring pupils' vocabulary profile

The vocabulary profiles presented in this section were selected based on being the two pupils with the highest receptive vocabulary size, based on the VST. Participant B1 and B16 had a receptive vocabulary size of 14,200 and 12,700 respectively.

Table 8 presents the productive vocabulary profile, which shows that they have a productive vocabulary size of approximately 4,000 word families, as 98% token coverage is reached after the K4 frequency level. The text consisted of 451 words, with 410 of the tokens occurring at the K1 frequency level which makes up the largest portion of the text. However, they also used 25 tokens word from the K2 level, four from the K3 level, seven from the K4 level, as well as one from each of the K5, K7, K8, K9 and K14 levels. The words that occurred at these levels were “memorable”, “overload”, “drench”, “excruciating” and “rollercoaster”, respectively. The number of tokens from the K1 frequency level make up 90.9% of the text, while a total of seven tokens in the text are from the K4 level, which covers 1.6% of the tokens in the text. Example of the words that occur in the K1 level in this text are typical function words such as “be”, “I”, “of” and “the”. There are no words that occur in the Off-List

category. In terms of lexical richness, the lexical density for this profile was 0.46, which is measured by dividing the number of content words in the text with the total number of tokens. The TTR was 0.46, showing relatively high lexical variation in the text.

Table 8: Vocabulary profile of participant B1, with related ratios and indices.

Freq. Level	Families (%)	Types (%)	Tokens (%)	Cumul. token (%)
K-1 words:	134 (82.2)	172 (85.15)	410 (90.9)	90.9
K-2 words:	14 (8.6)	15 (7.43)	25 (5.5)	96.4
K-3 words:	4 (2.5)	4 (1.98)	4 (0.9)	97.3
K-4 words:	6 (3.7)	6 (2.97)	7 (1.6)	98.9
K-5 words:	1 (0.6)	1 (0.5)	1 (0.2)	99.1
K-6 words:				
K-7 words:	1 (0.6)	1 (0.5)	1 (0.2)	99.3
K-8 words:	1 (0.6)	1 (0.5)	1 (0.2)	99.5
K-9 words:	1 (0.6)	1 (0.5)	1 (0.2)	99.7
K-10 words:				
K-11 words:				
K-12 words:				
K-13 words:				
K-14 words:	1 (0.6)	1 (0.5)	1 (0.2)	99.9
K-15 words:				
K-16 words:				
K-17 words:				
K-18 words:				
K-19 words:				
K-20 words:				
K-21 words:				
K-22 words:				
K-23 words:				
K-24 words:				
K-25 words:				
Off-List:	??	0 (0.00)	0 (0.00)	100.00
Total (unrounded)	163+?	202 (100)	451 (100)	≈100.00

Related ratios & indices	
<i>Pertaining to whole text</i>	
Words in text (tokens):	451
Different words (types):	202
Type-token ratio (TTR):	0,45
Tokens per type:	2,23
Lexical density:	0,46
(content [209]/total [451])	
<i>Pertaining to onlist only</i>	
Tokens:	451
Types:	202
Families:	163
Tokens per Family:	2,77
Family/token ratio (FTR):	0,36
Types per Family:	1,24

In table 9, the vocabulary profile of participant B16 is presented. Based on the text profile, the estimated productive vocabulary size of this learner text was 5,000 word families. Of the texts total of 394 tokens, they used 367 of these from the K1 frequency level, 11 from the K2 level, and three from the K3. In addition, they also used one word family from the K4, K6 and K7 frequency level, as well as three from K5. The words from the K6 and K7 level were “ordeal” and “excerpt”. The pupil had 2 types within the Off-List category. The words used were “bubblegum” and “gumballs”. The text had 93.1% of the tokens occurring at the first frequency level. Furthermore, 98.2% of the token coverage occurred at the K5 level. The lexical density of the text was 0,42, while the TTR was 0,47.

Table 9: Vocabulary profile of participant B16, with related ratios and indices.

Freq. Level	Families (%)	Types (%)	Tokens (%)	Cumul. token (%)
K-1 words:	132 (87.4)	163 (88.59)	367 (93.1)	93.1
K-2 words:	10 (6.6)	10 (5.43)	11 (2.8)	95.9
K-3 words:	3 (2.0)	3 (1.63)	4 (1.0)	96.9
K-4 words:	1 (0.7)	1 (0.54)	2 (0.5)	97.4
K-5 words:	3 (2.0)	3 (1.63)	3 (0.8)	98.2
K-6 words:	1 (0.7)	1 (0.54)	1 (0.3)	98.5
K-7 words:	1 (0.7)	1 (0.54)	2 (0.5)	99.0
K-8 words:				
K-9 words:				
K-10 words:				
K-11 words:				
K-12 words:				
K-13 words:				
K-14 words:				
K-15 words:				
K-16 words:				
K-17 words:				
K-18 words:				
K-19 words:				
K-20 words:				
K-21 words:				
K-22 words:				
K-23 words:				
K-24 words:				
K-25 words:				
Off-List:	??	2 (1.09)	4 (1.02)	100.00
Total (unrounded)	151+?	184 (100)	394 (100)	≈100.00

Related ratios & indices	
<i>Pertaining to whole text</i>	
Words in text (tokens):	394
Different words (types):	184
Type-token ratio (TTR):	0,47
Tokens per type:	2,14
Lexical density:	0,42
(content [167]/total [394])	
<i>Pertaining to onlist only</i>	
Tokens:	390
Types:	182
Families:	151
Tokens per Family:	2,58
Family/token ratio (FTR):	0,39
Types per Family:	1,21

Among the two texts submitted by the two pupils with a high receptive vocabulary size, only a single lexical error was found. Based on Engber’s (see Table 1) classification of lexical errors, the error was a lexical choice, more specifically a phrase error. The sentence in question is the following, with the corrected word choice in parenthesis:

I.B.2 Phrase: “He desperately tried to *throw* the gumballs *up*” (throw up the gumballs).

4.3.2 Average scoring pupils’ vocabulary profile

The vocabulary profiles presented in this section were selected based on being closest to the average receptive vocabulary size in the present study, which was 7,795 word families. Based on the VST, participant A17 and B11 both had a receptive vocabulary size of 7,800, which was closest to the average receptive vocabulary size of 7,795.

Table 10 presents the vocabulary profile of participant A17. This pupil’s productive vocabulary size is estimated to be 4,000 word families. This pupil used words from the K1

through the K4 frequency level, highly reliant on words from the first frequency level, making out 91% of tokens in the text. There was a total of 333 tokens in the text, with 303 of these occurring within the K1 level. The text had 12 word families from the K2 level, as well as one from both the K3 and the K4 level. In addition, the words “app” and “tok” were the two types that occurred in the Off-List category. Based on context, the pupil may have used the abbreviation for “application” when writing “app”. Furthermore, “tok” seems to be a part of the word “tiktok”, a social media site, that the pupil has split into two words in the text, resulting in four tokens in Off-List word. The text has less a lexical density of 0.38, and a TTR of 0.39.

Table 10: Vocabulary profile of participant A17, with related ratios and indices.

Freq. Level	Families (%)	Types (%)	Tokens (%)	Cumul. token (%)
K-1 words:	99 (87.6)	114 (87.69)	303 (91.0)	91.0
K-2 words:	12 (10.6)	12 (9.23)	19 (5.7)	96.7
K-3 words:	1 (0.9)	1 (0.77)	1 (0.3)	97.0
K-4 words:	1 (0.9)	1 (0.77)	3 (0.9)	97.9
K-5 words:				
K-6 words:				
K-7 words:				
K-8 words:				
K-9 words:				
K-10 words:				
K-11 words:				
K-12 words:				
K-13 words:				
K-14 words:				
K-15 words:				
K-16 words:				
K-17 words:				
K-18 words:				
K-19 words:				
K-20 words:				
K-21 words:				
K-22 words:				
K-23 words:				
K-24 words:				
K-25 words:				
Off-List:	??	2 (1.54)	7 (2.10)	100.00
Total (unrounded)	113+?	130 (100)	333 (100)	≈100.00

Related ratios & indices	
<i>Pertaining to whole text</i>	
Words in text (tokens):	333
Different words (types):	130
Type-token ratio (TTR):	0,39
Tokens per type:	2,56
Lexical density:	0,38
(content [128]/total [333])	
<i>Pertaining to onlist only</i>	
Tokens:	326
Types:	128
Families:	113
Tokens per Family:	2,88
Family/token ratio (FTR):	0,35
Types per Family:	1,13

The second average scoring vocabulary profile is presented in Table 11. Participant B11 had a receptive vocabulary size of 7,800, and based on the productive vocabulary profile, an estimated productive vocabulary size of 3,000. This text was the longest of the selected vocabulary profiles, with a total of 632 tokens. 87.5% of the tokens was within the K1 level,

with 553 tokens. The pupil used word families from the first five frequency levels, as well as one word from the K12 level. The pupil used many content words, so despite having text of 632, the lexical density was 0.48. The text had a total of 253 different types, which resulted in a TTR of 0.40.

Table 11: Vocabulary profile of participant B11, with related ratios and indices.

Freq. Level	Families (%)	Types (%)	Tokens (%)	Cumul. token (%)
K-1 words:	166 (79.4)	208 (82.21)	553 (87.5)	87.5
K-2 words:	29 (13.9)	31 (12.25)	50 (7.9)	95.4
K-3 words:	9 (4.3)	9 (3.56)	24 (3.8)	99.2
K-4 words:	3 (1.4)	3 (1.19)	3 (0.5)	99.7
K-5 words:	1 (0.5)	1 (0.40)	1 (0.2)	99.9
K-6 words:				
K-7 words:				
K-8 words:				
K-9 words:				
K-10 words:				
K-11 words:				
K-12 words:	1 (0.5)	1 (0.40)	1 (0.2)	100.0
K-13 words:				
K-14 words:				
K-15 words:				
K-16 words:				
K-17 words:				
K-18 words:				
K-19 words:				
K-20 words:				
K-21 words:				
K-22 words:				
K-23 words:				
K-24 words:				
K-25 words:				
Off-List:	??	0 (0.00)	0 (0.00)	
Total (unrounded)	209+?	253 (100)	632 (100)	≈100.00

Related ratios & indices	
<i>Pertaining to whole text</i>	
Words in text (tokens):	632
Different words (types):	253
Type-token ratio (TTR):	0,40
Tokens per type:	2,50
Lexical density:	0,48
(content [305]/total [632])	
<i>Pertaining to onlist only</i>	
Tokens:	632
Types:	253
Families:	204
Tokens per Family:	3,02
Family/token ratio (FTR):	0,33
Types per Family:	1,21

Regarding lexical errors, three types of mistakes were found among the average scoring pupils' texts. The type of mistake is numbered based on Table 1, and the examples from the two texts are the following, including the corrected word choice:

I.B.2 Phrase: “*Over the time*, humans have...” (Over time)

I.A.2 Incorrect – Semantically close: “...your brain is getting *bad*.” (weak/weaker)

II.1 Derivational error: “...a boy that *is having* muscles...” (has)

4.3.3 Low scoring pupils' vocabulary profile

The vocabulary profiles presented in this section were selected based on being the two pupils with the lowest receptive vocabulary size, based on the VST. Participant A1 and B4 had a receptive vocabulary size of 4,500 and 4,200, respectively.

In Table 12, the vocabulary profile of participant A1 is presented. This pupil has only used words from the K1, K2 and K3 level. The productive vocabulary of this participant was estimated to be 3,000 word families. The pupil used 85 word families within the K1 level, and the most frequently used words were typical function words such as “and”, “be”, “it” and “you”. The text consisted of a total of 117 types and 217 tokens, resulting in a TTR of 0.54. The lexical density of the text was 0.45.

Table 12: Vocabulary profile of participant A1, with related ratios and indices.

Freq. Level	Families (%)	Types (%)	Tokens (%)	Cumul. token (%)
K-1 words:	85 (87.6)	101 (86.32)	189 (87.1)	87.1
K-2 words:	9 (9.3)	12 (10.26)	20 (9.2)	96.3
K-3 words:	3 (3.1)	4 (3.42)	8 (3.7)	100.0
K-4 words:				
K-5 words:				
K-6 words:				
K-7 words:				
K-8 words:				
K-9 words:				
K-10 words:				
K-11 words:				
K-12 words:				
K-13 words:				
K-14 words:				
K-15 words:				
K-16 words:				
K-17 words:				
K-18 words:				
K-19 words:				
K-20 words:				
K-21 words:				
K-22 words:				
K-23 words:				
K-24 words:				
K-25 words:				
Off-List:	??	0 (0.00)	0 (0.00)	
Total (unrounded)	97+?	117 (100)	217 (100)	≈100.00

Related ratios & indices	
<i>Pertaining to whole text</i>	
Words in text (tokens):	217
Different words (types):	117
Type-token ratio (TTR):	0,54
Tokens per type:	1,85
Lexical density:	0,45
(content [98]/total [217])	0,45
<i>Pertaining to onlist only</i>	
Tokens:	217
Types:	117
Families:	97
Tokens per Family:	2,24
Family/token ratio (FTR):	0,45
Types per Family:	1,21

The last vocabulary profile belongs to participant B4 who had the lowest receptive vocabulary size in the present thesis. In Table 13, the vocabulary profile is presented, which resulted in an

estimated productive vocabulary size of 3,000. The text is highly reliant on tokens from the K1 level, with 94.9% of the text’s tokens occurring at this level. The text had words from the K2, K3, K5 and K6 level. The words used in the K5 and K6 level were “mobbing”, “picnic” and “pharmacy”. Based on context, the word “mobbing” was likely meant to refer to bullying. If this word was translated more precisely, the text would have the word “bullying” from the K4 level instead of “mobbing” from the K5. The TTR of the text was 0.40, while the lexical density was measured to be 0.39 with 136 content words compared to the total 352 words in the text.

Table 13: Vocabulary profile of participant B4, with related ratios and indices.

Freq. Level	Families (%)	Types (%)	Tokens (%)	Cumul. token (%)
K-1 words:	111 (93.3)	129 (91.49)	334 (94.9)	94.9
K-2 words:	4 (3.4)	5 (3.55)	10 (2.8)	97.7
K-3 words:	1 (0.8)	1 (0.71)	2 (0.6)	98.3
K-4 words:				
K-5 words:	2 (1.7)	2 (1.42)	2 (0.6)	98.9
K-6 words:	1 (0.8)	1 (0.71)	1 (0.3)	99.2
K-7 words:				
K-8 words:				
K-9 words:				
K-10 words:				
K-11 words:				
K-12 words:				
K-13 words:				
K-14 words:				
K-15 words:				
K-16 words:				
K-17 words:				
K-18 words:				
K-19 words:				
K-20 words:				
K-21 words:				
K-22 words:				
K-23 words:				
K-24 words:				
K-25 words:				
Off-List:	??	3 (2.13)	3 (0.85)	100.00
Total (unrounded)	119+?	141 (100)	352 (100)	≈100.00

Related ratios & indices	
<i>Pertaining to whole text</i>	
Words in text (tokens):	352
Different words (types):	141
Type-token ratio (TTR):	0,40
Tokens per type:	2,50
Lexical density:	0,39
(content [136]/total [352])	
<i>Pertaining to onlist only</i>	
Tokens:	349
Types:	138
Families:	119
Tokens per Family:	2,93
Family/token ratio (FTR):	0,34
Types per Family:	1,16

Regarding lexical errors, X types of mistakes were found among the low scoring pupils’ texts. The type of mistake is numbered based on Table 1, and the examples from the two texts are the following, including the corrected word choice:

II.1 Derivational error: “Back in the days you *gotta* do everything by yourself...” (had to)

I.B.1 Two lexical items: “In my generation, *every youth is* smoking ” (everybody in their youth are)

II.1 Derivational error: “I will not let my *childs...*” (children)

II.4 Major spelling error: “have bad *behathers*” (behavior)

I.A.1 Incorrect. Semantically unrelated: “I won’t let my child *live* all the bad experiences I had” (have)

4.4 Questionnaire findings

In this section, the findings from the questionnaire are presented. Nine of the participants in the project were absent and not able to answer the questionnaire. However, the majority did answer, so the findings from the questionnaire represent 61 of the participants. The findings from the questionnaire will be presented in sections 4.4.1-4.4.4. The findings are divided into topics of (1) extramural English activities, (2) learner beliefs about vocabulary, (3) habits at school, and (4) open-ended answers. In section 4.4.5, six participants who scored a high receptive vocabulary size were selected to be able to examine the correlation between their reported time spent on extramural activities and their receptive vocabulary. The same is done in sections 4.4.6 and 4.4.7, but then with six participants who had an average score on the VST and six participants with a low score to examine if there are any significant differences between high-, average- and low scorers.

4.4.1 Extramural English activities

Firstly, displayed in Figure 1, the participants were asked which social media sites or apps they use, with the option to choose between eight well-known social media sites. In addition, they were able to choose to answer “none of the above” as well as “other social media sites” in case the list of sites was not sufficient. The figure shows that over 80% of the participants use Tik Tok, Instagram and YouTube, which can be labeled as video- and photo-sharing platforms. 95% of the participants answered that they use Snapchat, which is a combination of a communication platform and video- and photo-sharing platform. Almost 40% of the participants use Discord, which is a communication platform for gamers worldwide.

Hvilke av følgende sosiale medier bruker du?		
Svar	Antall	% av svar
Tik Tok	54	88,5 %
Instagram	49	80,3 %
Twitter	12	19,7 %
Facebook/Messenger	11	18,0 %
Youtube	49	80,3 %
Snapchat	58	95,1 %
Discord	24	39,3 %
Twitch	7	11,5 %
Ingen av de nevnte	1	1,6 %
Andre sosiale medier	5	8,2 %

Figure 1: Questionnaire item concerning social media sites.

In Figure 2, when asked whether the content they view on social media sometimes is in English, 92% of the respondents said that the content “very often” is in English, while the remaining 8% answered “often” and “occasionally”. This shows that the majority of the group is regularly exposed to English through the content they view on social media.

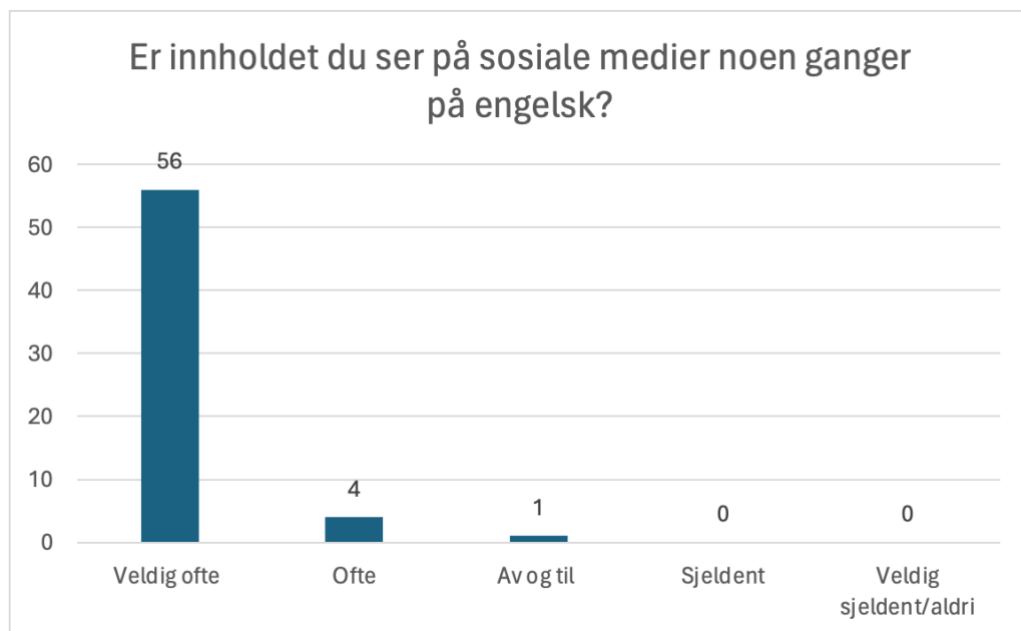


Figure 2: Questionnaire item concerning social media.

Figure 3 shows six questions where the participants were asked to give an estimate of how many hours per day they spend on various activities which includes English language. The following questions are presented: “How many hours per day do you spend on social media sites where you read or listen to English language? How many hours per day do you watch TV-series or movies with English speech? (TV or streaming services such as Netflix, Disney+, HBO-max, etc.) How many hours per day do you listen to music with English speech? How many hours per day do you listen to audiobooks with English speech? How many hours per day do you listen to podcasts with English speech? If you are into gaming (e.g. PC-games, PlayStation, Xbox, or other gaming-platforms), how many hours per day do you play games where you read or listen to English text or speech?”. The participants had the option to answer; “5 hours or more”, “3-4 hours”, “1-2 hours”, “Under 1 hour” or “not at all”.

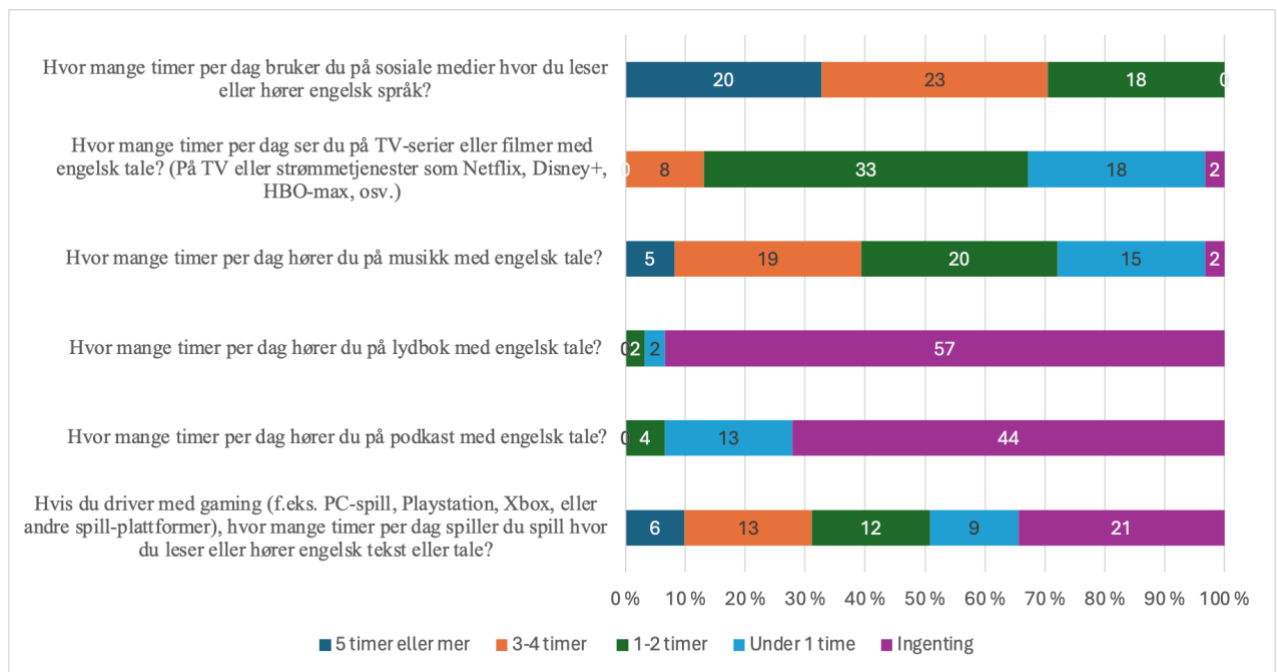


Figure 3: Questionnaire items concerning time spent on activities that include English language.

Figure 3 shows that 20 participants, which equals 32%, said that they spend 5 hours or more per day on social media reading or listening to English language. 38% said that they spend 3-4 hours per day, while the remaining 30% spend 1-2 hours reading or listening to English language. When asked about time spent watching TV-series or movies with English speech, 67% of the participants said they spend 1 hour or more per day. 72% of the pupils listen to music with English speech at least 1-2 hours a day, and only 0,3% did not listen to music at

all. Only 0,7% of the pupils said they spend 1-2 hours listening to podcasts, 21% said under 1 hour, while the remaining 72% said that they did not listen to podcasts at all. A similar result is shown about audiobooks, with 93% answering that they do not listen to it at all, and only 0,7% answering either under 1 hour or 1-2 hours. Lastly, 51% of the participants spend at least 1 hour per day playing games with English language, with six pupils spending 5 hours or more per day.

4.4.2 Learner beliefs about vocabulary

The following three figures present findings related to learners' beliefs about vocabulary learning. In Figure 4, the following statements are presented: I have learned most of my English vocabulary at school. It is necessary to understand culture of English-speaking countries to learn English language. It is easier to learn a new language if you already know several languages. It is important with repetition and practice of vocabulary to learn English. The best way to expand your vocabulary is to read a lot. The participants had the option to answer: Strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree.

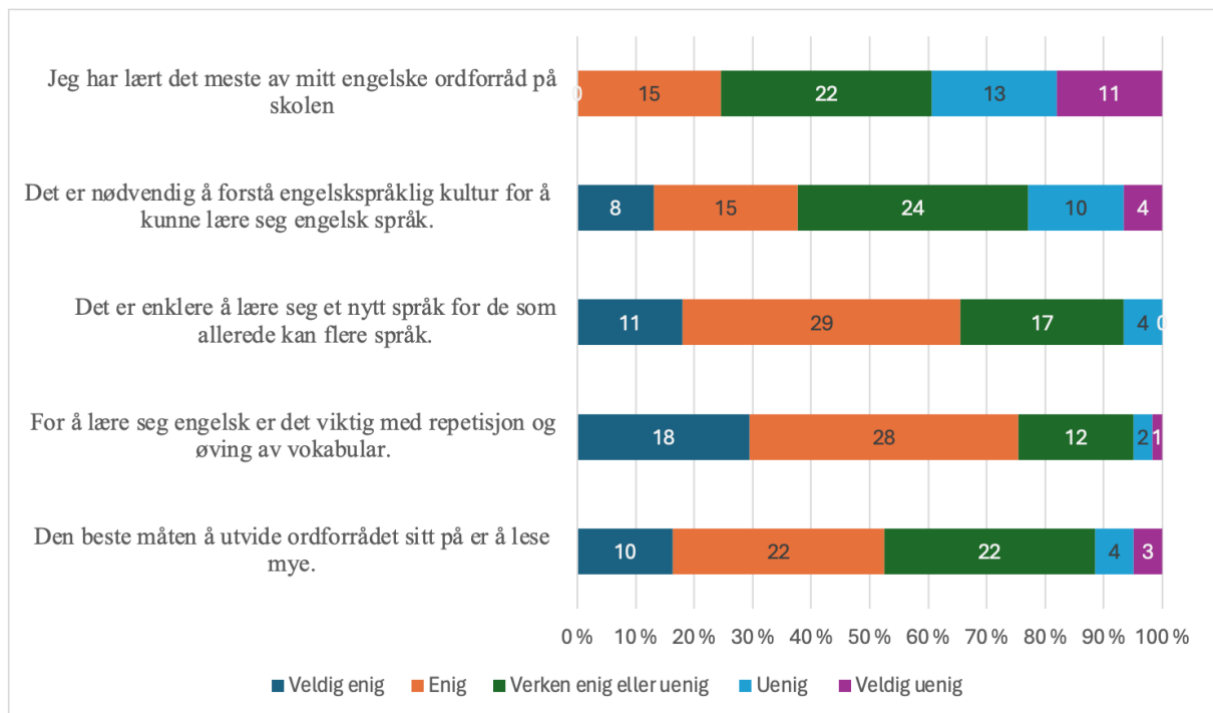


Figure 4: Questionnaire items concerning learner beliefs about vocabulary.

As seen above, only 25% agreed that they have learned most of their English vocabulary at school, while 36% neither agreed nor disagreed, and the remaining 39% either disagreed or

strongly disagreed with the statement. 66% of the participants either agreed or strongly agreed that it is easier to learn a new language if you already know several languages. It was also largely agreed that it is important with repetition and practice of vocabulary to learn English, with 75% of the pupils either agreeing or strongly agreeing with this statement. 52% of the participants also either strongly agreed or agreed that reading a lot was the best way to expand your vocabulary.

Figure 5 present the following statements: Your English vocabulary would grow by living in an English-speaking country over time. It is difficult to learn to use new English words. A good memory is important when learning new English words. I mostly learn new English words by understanding them from an oral context. I mostly learn new English words by understanding them from a written context.

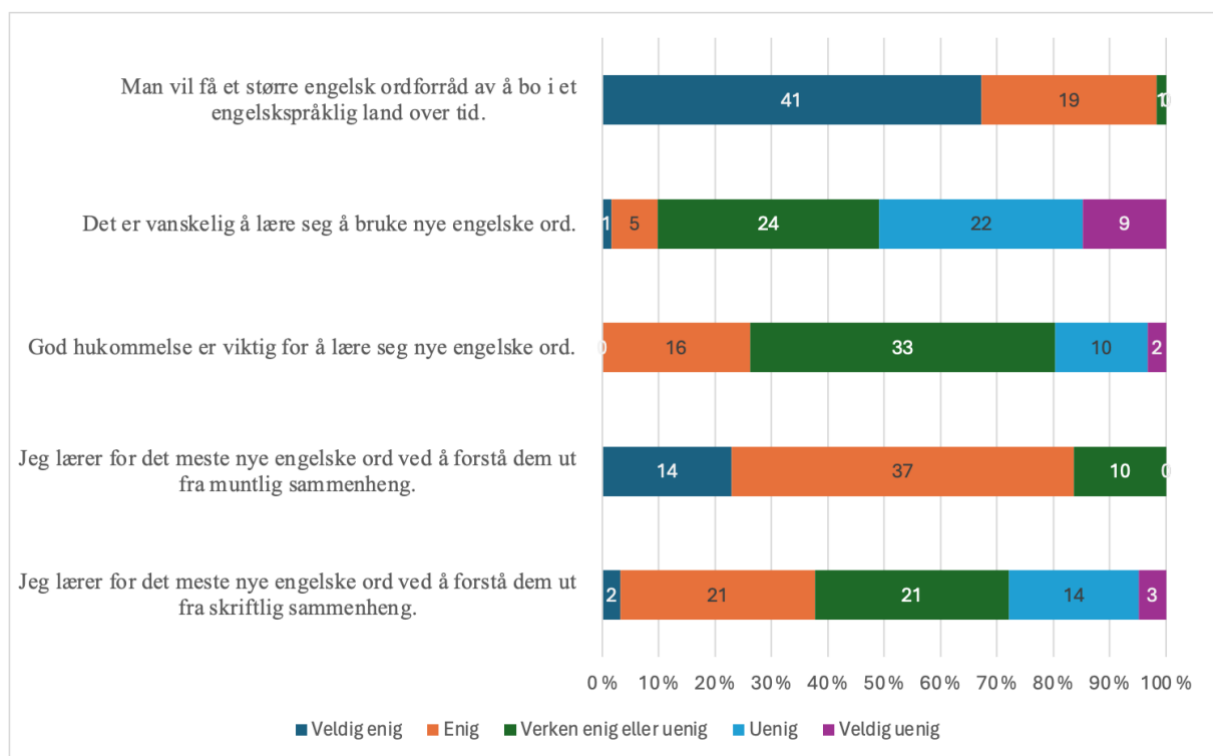


Figure 5: Questionnaire items concerning learner beliefs about vocabulary.

As seen in Figure 5, 98% of the participants agreed or strongly agreed that your English vocabulary would grow by living in an English-speaking country over time, with the final participant neither agreeing nor disagreeing. 51% of the participants disagreed or strongly disagreed that it is difficult to learn to use new English words. 54% neither agreed nor

disagreed that a good memory is important when learning new English words, while 26% agreed that it is important. 84% of the participants either agreed or strongly agreed that they mostly learn new English words by understanding them from an oral context. In contrast, the participants were more divided when asked whether they mostly learn new English words by understanding them from a written context, as 38% either agreed or strongly agreed, while another 29% either disagreed or strongly disagreed. A similar split can be seen with the third statement, as 26% agreed that a good memory is important when learning new English words, and 20% either disagreed or strongly disagreed.

In Figure 6, the following statements are presented: I feel I mainly learn new words in English by picking them up myself, without memorizing them. I feel I mainly learn new words in English by memorizing them. I feel it is easier to learn new English words from context when it includes picture and/or sound. I learn a lot of English vocabulary when I am not at school. I speak English when I am not at school (e.g., with friends, family, at social media sites, etc.)

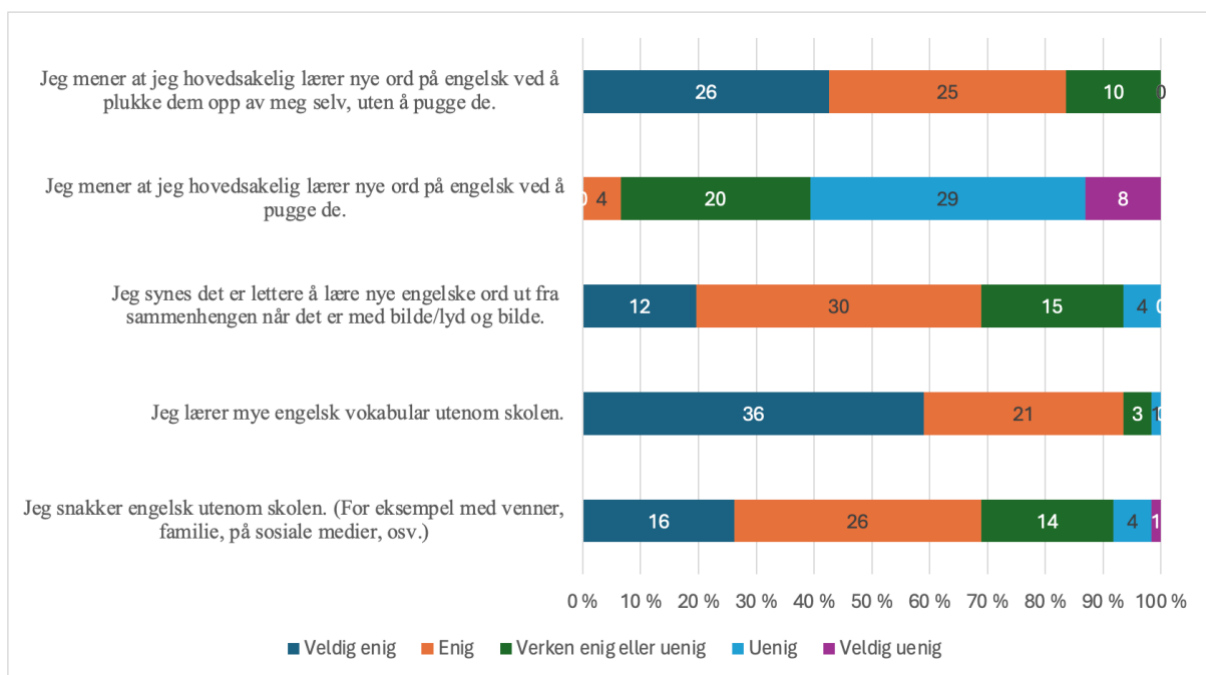


Figure 6: Questionnaire item concerning learner beliefs about vocabulary.

84% of the participants either strongly agreed or agreed that they feel they mainly learn new words in English by picking them up themselves, without memorizing them. 61% either disagreed or strongly disagreed that they learn new English words by memorizing them, while 7% agreed with the statement. 69% of the participants either agreed or strongly agreed that it

is easier to learn new English words from context when it includes picture and/or sound. 93% either agreed or strongly agreed that they learn a lot of English vocabulary when they are not at school, as well as 69% either agreeing or strongly agreeing that they speak English outside of school.

4.4.3 Habits

In Figure 7, questionnaire items concerning the different habits of the participants are presented. The following statements are included: I use/prefer Norwegian subtitles when I watch English-speaking TV-series/movies. I use/prefer English subtitles when I watch English-speaking TV-series/movies. I read English books when I am not at school. I read English books when I am at school. I read news in English. We learn how we can understand new words from context at school. I know enough vocabulary to express myself precisely when I have written assignments at school. I need to learn more vocabulary to express myself precisely when I have written assignments at school.

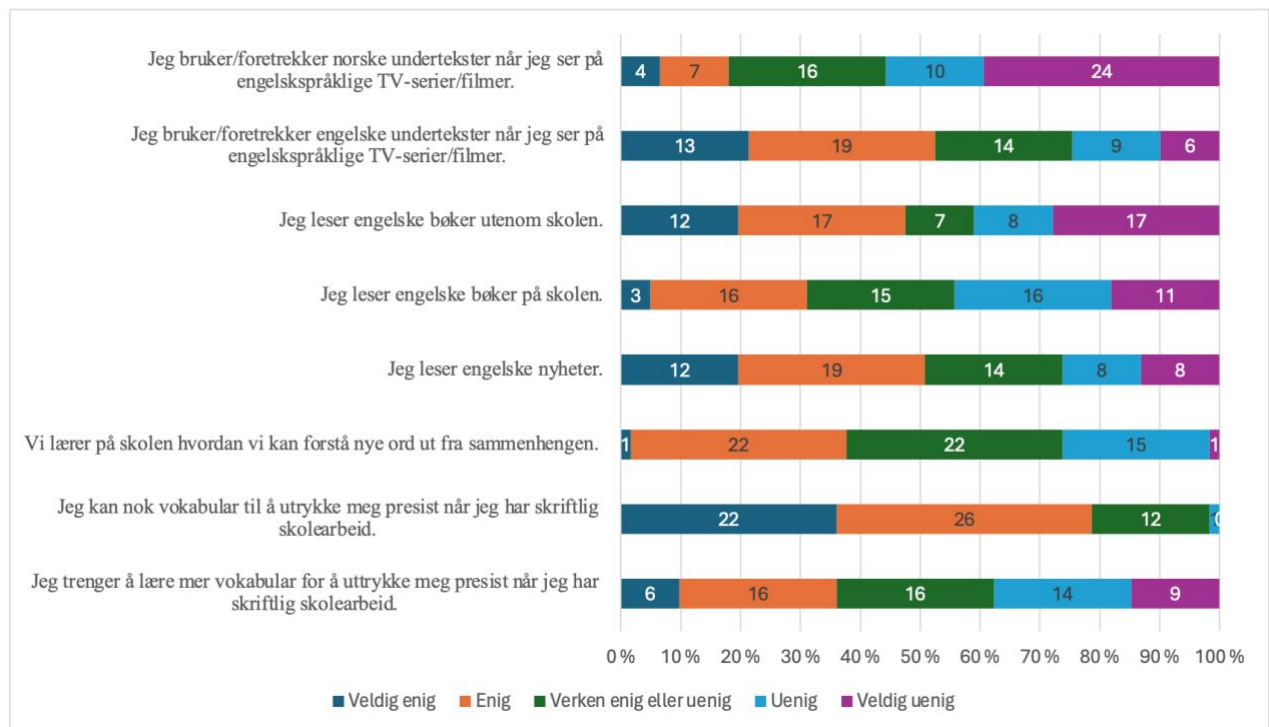


Figure 7: Questionnaire items concerning habits.

As seen above, the participants mainly use or prefer English subtitles when watching English-speaking TV-series or movies, with 52% either agreeing or strongly agreeing with this statement, in contrast with 18% who use or prefer Norwegian subtitles. When it comes to

reading English, 48% either agreed or strongly agreed that they read English books when they are not at school, as well as 51% answering that they read news in English. 79% of the participants either agreed or strongly agreed that they know enough vocabulary to express themselves precisely when having written assignments at school, with only 2% disagreeing with the statement. Lastly, the participants were fairly divided on the statement of whether they feel they need to learn more vocabulary to be able to express themselves precisely when having written assignments at school as 36% either agreed or strongly agreed, and 38% either disagreed or strongly disagreed.

Figure 8 presents findings from questionnaire items concerning the use of glossary tests and the learning platform Quizlet, with the following statements included: We have glossary tests at school. We use Quizlet at school for vocabulary learning. We use Quizlet at school to use new words we have learned.

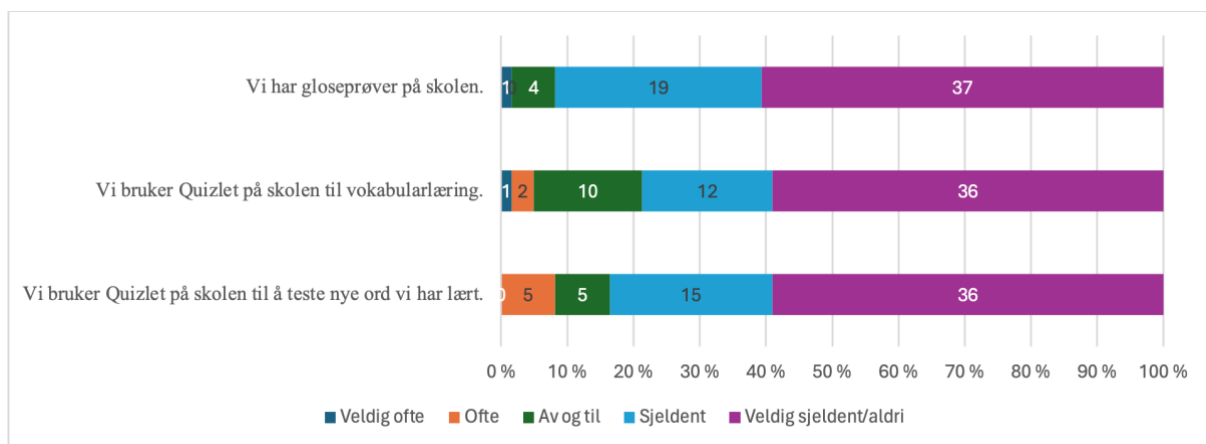


Figure 8: Questionnaire items concerning glossary tests and Quizlet.

The findings indicate that glossary tests and Quizlet are rarely or never used in the different groups, as 92% answer that they rarely or very rarely/never have glossary tests, as well as 79% and 84% answering the same on whether they use Quizlet for vocabulary learning or to use new words they have learned.

4.4.4 Open-ended answers

The final question of the questionnaire was the open-ended question where the participants were asked in what contexts they learn new words in English. Of the 61 pupils who responded to the questionnaire, 60 gave an answer to the final question. As open-ended questions leave

room for interpretation, the answers to the question may vary based on how the individual respondent has understood the question. However, based on the answers, three categories have been made to be able to classify the answers as they revealed that three types of answers typically occurred. These categories include “through EE activities”, “at school”, and “from an oral context/communication”. Some of the answers fitted within more than one category and is therefore included in all the relevant categories. 54 of the answers were within the “through EE activities” category, as most answers included different kinds of EE activities, such as social media and gaming. 15 answers were included in the “at school” category. 26 of the answers were categorized as “from an oral context/communication” as many pupils answered that they learn new words through conversation with others or specified “oral context”. As a result, 90% of the answers were included in the “through EE activities” category, 25% in the “at school” category, and 43% in the “from an oral context/communication” category.

4.4.5 High receptive vocabulary size answers

With the aim to investigate how reported exposure to EE reflects the learners’ receptive vocabulary size, three groupings have been made to closer examine how much time pupils with a high-, average- and low receptive vocabulary size believe they spend on EE activities. The questions are the same as in Figure 3, but the answers are from six pupils within each group.

In Figure 9, answers from the six pupils who scored the highest receptive vocabulary size among the participants are presented. All the six pupils had a receptive vocabulary size of over 10,000 word families. The participants were B1, B16, B23, B5, B23, and B21.

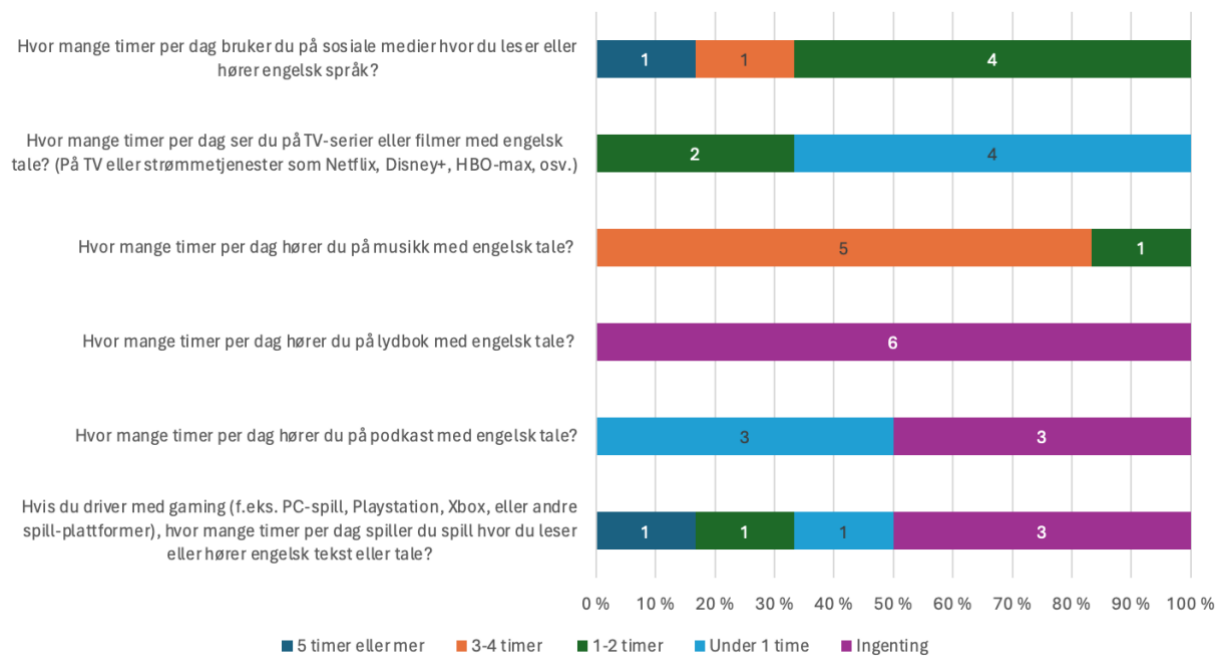


Figure 9: Reported time spent on EE, pupils with high receptive vocabulary size.

One pupil spends 5 hours or more on social media where they either read or listen to English language, while four of the six spend between 1-2 hours. Four pupils watch TV-series or movies with English speech for under 1 hour per day, while the remaining two spends 1-2 hours. Furthermore, five of the six pupils answered that they listen to music with English language for 3-4 hours. None of the six listens to audio books at all, and three within the group do not listen to podcasts, while the other three answered that they listen to podcasts for under 1 hour per day. The group was somewhat divided in terms of time spent gaming, with one pupil spending 5 hours or more, another 1-2 hours, one under 1 hour, and three did not spend time gaming at all.

4.4.6 Average receptive vocabulary size answers

In Figure 10, six pupils closest to the average receptive vocabulary size were selected. Some pupils in this category were absent from when the questionnaire was conducted, so the next pupil closest to the average was selected. The participants selected for this group were C3, C13, C12, B11, A2, and A8.

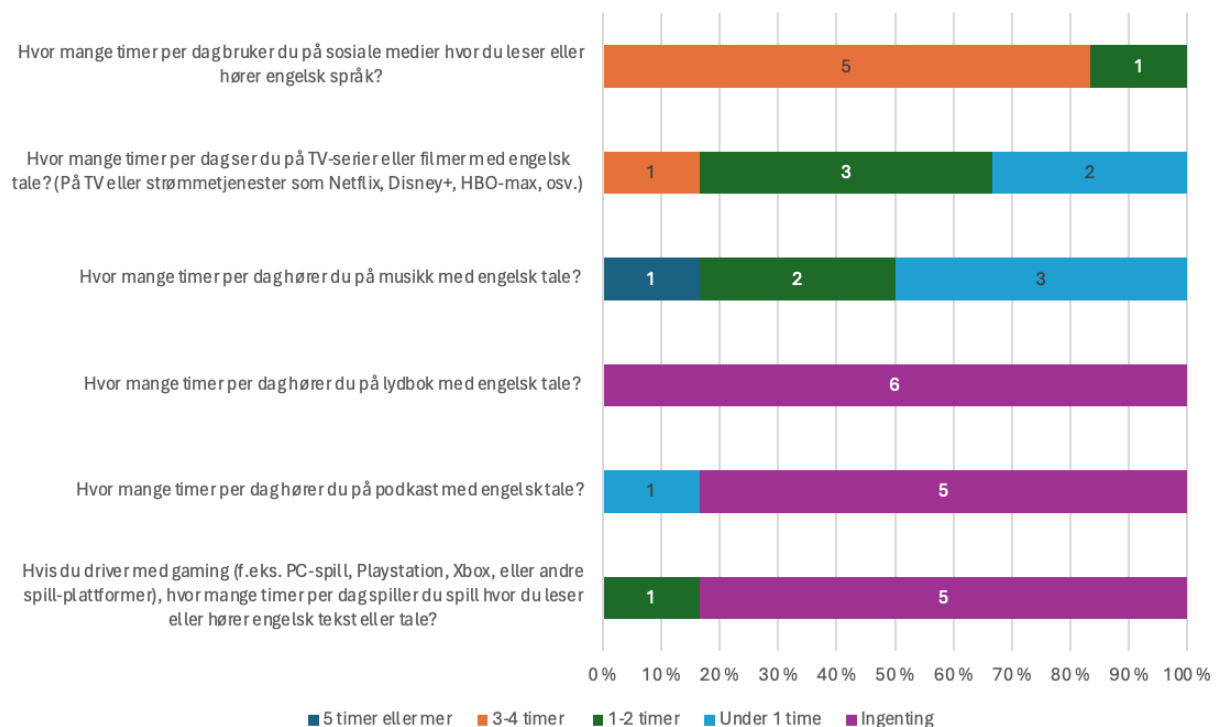


Figure 10: Reported time spent on EE, pupils with average receptive vocabulary size.

The results show that five of the six pupils spend 3-4 hours daily on social media where they either read or listen to English language, while one spends between 1-2 hours. One pupil watches TV-series or movies with English speech between 3-4 hours per day, three pupils watch for 1-2 hours, while two of them watch under 1 hour per day. Three of the pupils answered that they spend under 1 hour per day listening to music with English speech, while two of them spend between 1-2 hours. One of the pupils spends 5 hours or more listening to music with English speech per day. All six pupils answered that they never listen to English audio books, and five of six never listens to podcasts with English speech. Five of the pupils also answered that they do not spend any time gaming. One of the pupils listens to podcast with English speech for under 1 hour per day, and one pupil spends 1-2 hours gaming daily.

4.4.7 Low receptive vocabulary size answers

Figure 11 presents the answers from the pupils who had the lowest receptive vocabulary size who were able to respond to the questionnaire. As in the previous figure, some of the pupils in this category were absent when the questionnaire was conducted, and in this instance the next pupil with a low receptive vocabulary size was selected. The participants included in this group were B15, A1, B13, C5, B7, and A13.

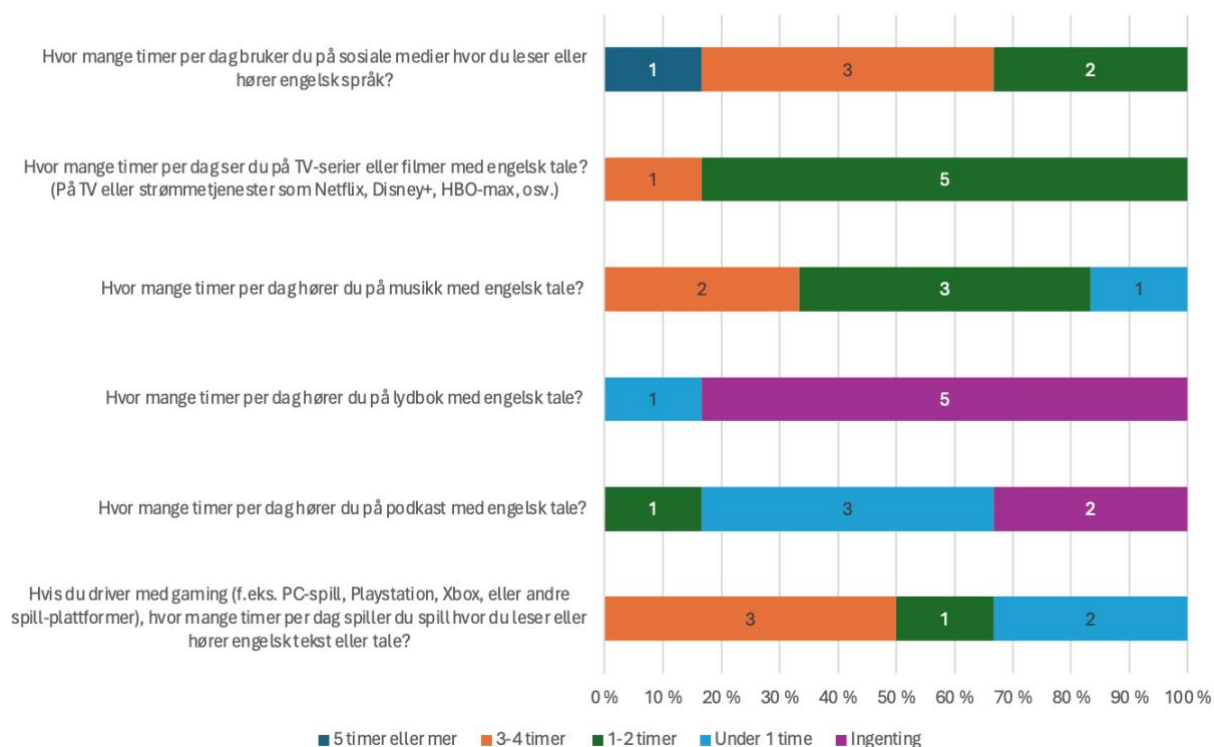


Figure 11: Reported time spent on EE, pupils with low receptive vocabulary size.

All the six pupils spend time every day on social media where they either read or listen to English language. Two of them spend between 1-2 hours, three spend between 3-4 hours, while one pupil spends 5 hours or more on social media per day. Five of six pupils watch between 1-2 hours of TV-series or movies with English speech, while one watch between 3-4 hours. The pupils all listen to music with English speech every day. Two of them between 3-4 hours per day, three of them between 1-2 hours, and one pupil listens under 1 hour per day. One of the pupils spends under 1 hour listening to audio books with English speech daily, while the other five do not spend any time at all. As for listening to podcast with English speech, two of the pupils do not listen at all, three of them listen under 1 hour per day, while one pupil listens between 1-2 hours per day. Three of six pupils answered that they spend between 3-4 hours gaming per day. One of the pupils spends between 1-2 hours gaming per day, while two spend under 1 hour gaming daily.

5.0 Discussion

5.1 Introduction

This chapter discusses the findings from the receptive vocabulary tests, the learner texts and the questionnaire answers in relation to relevant theory and research. The aim of the chapter is to discuss the findings in connection with the research questions. Section 5.2 discusses the receptive vocabulary sizes of the pupils, as well as how reported exposure to EE correlates with receptive vocabulary. Section 5.3 discusses the productive vocabulary size, and what characterizes it in terms of lexical richness. Lastly, in section 5.4, the learner beliefs about vocabulary learning are considered. The research questions are:

1. What are the English receptive and productive vocabulary sizes of Norwegian 10th graders?
2. What characterizes their productive vocabulary sizes in terms of lexical richness?
3. How is reported exposure to extramural English reflected in the learners' receptive vocabulary size?
4. What are the 10th grade learner beliefs about vocabulary learning?

5.2 Receptive vocabulary size and influence of Extramural English

Nation (2006) aimed to find out how large a vocabulary size is needed to comprehend a written or spoken text by deciding a vocabulary learning goal depending on how much vocabulary that would be needed to understand an English newspaper, read a novel, watch a movie, or take part in a conversation. According to Nation (2006), a vocabulary size of 8,000-9,000 word families is needed to comprehend most written text from a range of genres.

In the present study, the results show that the average receptive vocabulary size of 10th grade pupils at lower secondary school was 7,795 word families. The vocabulary size variation range within the study was 10,000 word families, with the highest reported receptive vocabulary size being 14,200 and the lowest 4,200. The results show that the average is fairly close to Nation's (2006) estimate of 8,000-9,000 word families for needed vocabulary to comprehend most written text. Considering Nation's (2006) argument of needing 98% coverage of a text to be able to reach unassisted comprehension, the average learner in the present study would likely be able to comprehend the majority of text genres, such as of a newspaper or a novel, and also to watch a movie or take part in a conversation, but would also likely face some struggles considering that such texts would also be outside of the 8,000-

9,000 word family threshold. Given that the receptive variation can range as much as 10,000 word families within a group of learners, it is important that teachers consider this when selecting teaching methods so that they are beneficial for all learners.

Considering the large variation in receptive vocabulary size, an implication of these results is that teachers should take caution when planning teaching methods and selecting teaching materials. The results revealed that several pupils had relatively low receptive vocabulary size, as eight pupils received a score below 6,000 word families. In cases like this, it is important that the teacher is aware of the difference in vocabulary knowledge that can occur within a class of pupils. The teacher should focus on exposing learners with low receptive vocabulary knowledge to teaching methods and teaching materials that promote vocabulary learning to aid their development. Teaching tools, such as glossing, which has been shown to lead to more vocabulary learning than reading without glosses as well as to a positive influence on reading comprehension (Nation, 2022), could be used to aid pupils with low receptive vocabulary size. In addition, the findings from the questionnaire showed that the learners rarely or never have glossary tests, which is also something that could be argued to be a relevant exercise for learners with low receptive vocabulary knowledge.

To compare with similar recent studies of L2 learners' vocabulary size, it may be argued that the resulting receptive vocabulary sizes of the present study indicate a relatively high vocabulary level regarding receptive vocabulary for 10th grade pupils. Sætevik (2018) investigated the receptive vocabulary size of 68 L2 learners in 10th grade and found that the average receptive vocabulary size was 6,635 word families. The sample size of the results from the VST in Sætevik's (2018) study and the present study only had a difference of two participants, and due to the closely similar sample size, it may be considered reasonable to compare the two results to each other. The average receptive vocabulary size in the present study is 1,144 word families larger than the result in Sætevik's (2018) study, and while there may be a number of reasons as to why the averages of these two studies vary as much as they do, it can indicate that the pupils in the present study possess high receptive vocabulary knowledge.

A study by Onyszko (2019) also investigated the receptive vocabulary size of L2 learners, but her study focused on learners from Vg1, the first year of upper secondary school. Onyszko (2019) found that the average receptive vocabulary size of learners at the Vg1 level was 8,338

word families. This study had a larger sample size than the present study and included 100 learners. It may be assumed that the average receptive vocabulary size from Onyszko's (2019) study would be higher considering that the learners have attended school for a year longer than the learners in the present study. Additionally, a factor that may also be considered is that pupils at the Vg1 level are learners who have actively chosen and applied to attend an academic studies course at an upper secondary school. This does not necessarily determine that learners are more proficient than others when it comes to receptive vocabulary knowledge, but it may be a counting factor towards a higher average. Nevertheless, the average receptive vocabulary size of the present study is not too far from the average of Onyszko's (2019) study. Taking age difference into account, this may also enhance the argument that the learners in the present study have a relatively high receptive vocabulary level for 10th grade pupils.

The present study also aimed to find out if the receptive vocabulary size of L2 learners had any correlation with reported time spent on extramural English activities. The results showed that the participants are regularly exposed to EE and given that the average receptive vocabulary was relatively high, it may be argued that reported time spent on EE activities has a positive influence on receptive vocabulary size. However, the results of the present study show that the reported time spent on EE activities are unable to explain the difference in the receptive vocabulary size among high and low scoring pupils. Within the three six-pupil groups based on high-, average- and low receptive vocabulary size, there was little difference between them considering reported time spent on EE activities that could indicate anything that would affect their vocabulary size. In terms of using social media where they read or listen to English language, watching TV with English speech, listening to audiobooks or podcasts, or gaming where they read, speak or listen to English language, pupils from the high-, average-, and low receptive vocabulary size groups all seem to have approximately similar daily routines. The only category where the high receptive vocabulary size group somewhat surpasses the other two groups is listening to music with English speech, where five of six pupils answered that they spend between 3-4 hours per day, while the other two groups express that they spend slightly less time listening to music with English speech.

The results of the current study thus support the findings in Sundqvist's (2009) study of Swedish ESL learners in 9th grade, where it was concluded that the total amount of time spent on EE correlated positively and significantly to learners' vocabulary size. It is also important

to note that Sundqvist's (2009) had a more thorough and time-consuming method to document time spent on EE activities which the present study was unable to apply. Sundqvist (2009) used diaries which required participants to document the amount of time they had spent on given EE activities, while the present study required participants to make an assumption of how much time they spent on different given EE activities per day. This way, Sundqvist (2009) was able to get a more accurate answer as to how much time each participant precisely spent on EE activities, while the present study was limited to get more of a sense of how much time the participants themselves believed they spent on EE activities.

Considering the development of mobile technology and social media in recent years, it may be argued that a lot has happened within extramural activities since Sundqvist's (2009) study. Leona et al. (2021) proved that EE exposure through entertaining media played a direct role in the vocabulary knowledge of young English language learners. The results of the present study showed that it can be argued that EE exposure correlates positively with pupils' receptive vocabulary size. However, the findings may not be sufficient to explain the difference between the pupils with high- and low- receptive vocabulary size. The EE may influence the receptive vocabulary for the group as a whole, as the previous research would suggest it does (Sundqvist, 2009; Leona et al., 2021), but the findings in the present study may also suggest that the reported time spent on EE are unable to explain the difference in receptive vocabulary size between learners with high-, average- and low receptive vocabulary sizes in this instance.

5.3 Productive vocabulary size

The results in the present study found that the average productive vocabulary size of 10th grade pupils at lower secondary school is 3,386 word families. The highest estimated productive vocabulary size was 5,000 and the lowest was 2,000. The variation range between the average productive vocabulary size and the average receptive vocabulary size is 4,409 word families, showing that the pupils have much higher receptive vocabulary knowledge than productive vocabulary knowledge.

The wide range between the receptive and the productive vocabulary sizes is not unexpected, as previous research on receptive and productive vocabulary knowledge often indicates a difference in mastery of the two. According to Schmitt and Schmitt (2020, p. 197), L2

learners face several challenges when writing in terms of vocabulary size, as they tend to struggle to unlock all their receptive vocabulary knowledge when producing written text. It is also argued by Webb and Nation (2017, p. 180) that productive learning is deemed more difficult than receptive, as it requires precise knowledge of form, meaning and use. Based on the range between receptive and productive vocabulary knowledge, the findings in the present study may indicate that wide receptive vocabulary knowledge does not equal a high level of productive mastery. Similar findings were presented by Lee (2003) who found that word comprehension did not predict productive use and argued that a way to help learners convert receptive knowledge to productive use is by giving explicit vocabulary instructions. Furthermore, Schmitt and Schmitt (2020, p. 162) argue that intentional vocabulary learning leads to a better chance of achieving productive levels of mastery. Additionally, this is also the focus of Nation's (2007) third strand, meaning-focused output, where the learning process focuses on the learner using language productively through both speaking and writing with the focus on vocabulary, amongst other features.

In terms of lexical richness, the present study aimed to investigate what characterizes the individual vocabulary profiles regarding lexical variation (TTR), lexical density and lexical errors. The results of the study showed some mixed results in terms of lexical variation. Schmitt (2010) argues that a greater number of TTR indicates a wider range of vocabulary used in a text. The two high scoring pupils had a TTR of 0.45 and 0.47, showing a good amount of lexical variation, compared to the two average scoring pupils who had a TTR of 0.39 and 0.40. However, the findings of the present study showed the TTR's sensibility to text length. Participant A1 (see Table 12), who had a productive vocabulary size of 3,000 had the highest TTR of 0.54, compared to participant B16 (see Table 9) who had a productive vocabulary size of 5,000, had a TTR of 0,47. Despite having a higher productive vocabulary size, participant B16 had less lexical variation. This could be due to text length, as participant A1 wrote 217 tokens, compared to participant B16's 394 tokens. Schmitt (2010, p. 213) argues that longer texts typically have lower TTR because there is less chance for a new word type to occur when more frequent types already has appeared. This may also be supported by the fact that participant B11 (see Table 11), who had relatively low TTR of 0.40, also had the longest text of the six vocabulary profiles, with 632 tokens.

Read (2000, p. 200) argues that a measure of good writing is shown if a text has lexical density above 0.40, meaning the text has a larger portion of content words compared to

function words than 40 percent. The findings in the present study show that the vocabulary profiles mainly indicate proficient lexical density among them. The written texts of the two high scoring pupils had lexical density of 0.46 and 0.42, while the two mid scoring pupils had 0.38 and 0.48. Lastly, the low scoring pupils had a score of 0.45 and 0.39 in terms of lexical density. The highest achieved score of lexical density was attained by one of the mid-scoring pupils at 0.48, who also had the longest text in terms of text length. This shows that the student was proficient at using content words, even when writing a longer text. Additionally, three pupils had a lexical density score above 0.40. Only two were below 0.40, but both were fairly close with 0.39 and 0.38. This demonstrates that the texts contain relatively large portion of content words compared to grammatical words, which according to Read (2000, p. 200) is a feature of good writing.

Lastly, related to lexical richness, the results of the present study show occurrences of different variety in terms of lexical errors. Several types of lexical errors, based on Engber's (1995) classification, were found among the six vocabulary profiles, such as phrase errors, derivational errors, and major spelling errors. Read (2000, p. 200) argues that the number of lexical errors in a text may be used as a measure of writing quality and suggests that ESL learners' written texts often contains several errors. The findings of the present study show that fewer lexical errors occurred in the texts of the high scoring vocabulary profiles than in the texts of the average- and low scoring profiles. This may imply that the pupils with lower receptive vocabulary struggle to know the correct use of words when producing text. This could relate to the fact that productive learning requires more precise knowledge of form, meaning and use than in receptive learning, according to Webb and Nation (2017, p. 180)

Compared to similar recent studies of productive vocabulary size, the findings in the present study show that the 10th grade pupils' average productive vocabulary size of 3,386 word families is lower than in the recent studies. The results of Onyszko's (2019) study of Vg1 pupils' vocabulary size showed an average productive vocabulary size of 4,769 word families, while Sætevik's (2018) study found an estimated average productive vocabulary size between 5,500 and 6,000 word families for both 8th and 10th graders. Comparing these results show relatively low average productive vocabulary size of the 10th graders in the present study, as the findings show a gap of 1,383 and 2,114 word families to Onyszko's (2019) and Sætevik's (2018) results, respectively.

An interesting aspect of the present study is that the pupils have larger receptive vocabulary size than recent studies show (Onyszko, 2019; Sætevik, 2018), simultaneously as they have smaller productive vocabulary size. The findings indicate that the pupils understand more, while they at the same time get inferior results in terms of productive use when producing text. This may imply that even though the learning of receptive vocabulary knowledge may have been effective, there is too little focus on promoting productive vocabulary knowledge as the gap to convert receptive knowledge into productive use has become wider. Regarding the teaching of productive vocabulary knowledge, this finding highlights the challenge L2 learners face when trying to use their productive vocabulary knowledge even when the receptive knowledge is present (Schmitt & Schmitt, 2020, p. 197), and strengthens the need to focus on giving explicit vocabulary instructions and showing learners how lexical variation affect the quality of writing (Lee 2003, p. 551), as intentional vocabulary teaching is argued to result in a greater amount of vocabulary acquisition as well leading to better chances of productive mastery (Schmitt & Schmitt, 2020, p. 162).

5.4 Learner beliefs about vocabulary

According to Horwitz (1999), learner beliefs influence both the actions and experiences of language learners. Additionally, White (1999) argues that learner beliefs shape and influence learners' expectations prior to their experiences, and that these experiences affect how they as learners respond to new environments. As learner beliefs can influence learners' experience in language learning, it is highly relevant to take their beliefs into account when considering vocabulary teaching. Therefore, it is important to uncover what beliefs learners have related to vocabulary. The findings from the questionnaire showed that 75% of the participants agreed that it is important with repetition and practice of vocabulary to learn English. This indicates that the learners value the importance of vocabulary when learning English and understand that it may be a key factor to learning English.

The findings from the questionnaire showed that the participants believe that regular exposure to English would enhance their vocabulary knowledge, as 98% agreed that their English vocabulary would grow by living in an English-speaking country over time (see Figure 5). It may not be possible to replicate the amount of exposure to English a learner would experience over time in an English-speaking country in a Norwegian teaching context. However, it may suggest that learners consider it valuable to regularly be exposed to English language, which

should motivate teachers to encourage the learners to use and speak English as much as possible in their teaching methods. This could be done by focusing on teaching English in an oral context, as the findings of the questionnaire show that 84% of the participants agree that they mostly learn new English words by understanding them from an oral context (see Figure 5). In contrast, only 38% agreed that they mostly learn new English words by understanding them from a written context (see Figure 5). Nation (2006) argues that a vocabulary size of 6,000-7,000 word families is needed for comprehension of spoken text, rather than the 8,000-9,000 needed for most written texts. This distinction could be used as a possible explanation as to why the participants favor oral context over written context, as a lower vocabulary size is needed for spoken text, and it would be easier or more understandable for the majority of the participants to comprehend spoken text.

Most of the participants believe their vocabulary knowledge level is sufficient in relation to written assignments at school. The findings show that 79% agreed that they know enough vocabulary to express themselves precisely when having written assignments at school, and only 36% agreed that they need to learn more vocabulary to be able to do the same (see Figure 7). The vocabulary knowledge related to written assignments concerns the productive vocabulary of the participants, and while the results of the questionnaire indicate that they believe they have enough vocabulary knowledge for written assignments in school, the average productive vocabulary size of 3,386 in the present study is notably lower than in recent similar research (see section 5.3). It is therefore important for teacher to specify learning aims for vocabulary and to explain to the learners what sufficient vocabulary knowledge entails. As outlined in the theory section, according to Schmitt and Schmitt (2020, p. 197) L2 learners face challenges with vocabulary size, word knowledge and lexical fluency when writing, and they may struggle to use their productive knowledge even when they have a high level of receptive knowledge. This is also backed up by Schmitt (2010) as he argues that little research has been capable of finding at what level receptive vocabulary knowledge turns into productive use. This is further supported as Lee (2003) found that word comprehension does not automatically predict productive use, and that L2 learners' productive learning benefited from explicit vocabulary instructions. The resulted average productive vocabulary size in the present study may indicate that teachers should focus on teaching methods that promote guiding learners in production tasks, even in the case when the learner beliefs show that the learners believe they know enough vocabulary for written production.

The questionnaire findings demonstrated relatively positive beliefs concerning reading. The findings showed that 52% of the participants agreed that the best way to expand your vocabulary is by reading a lot (see Figure 4). In addition, the findings showed that 48% reported that they read English books when they are not at school (see Figure 7). Schmitt and Schmitt (2020) emphasize the positive effect reading can have on vocabulary learning. However, they also stress that frequent exposure is essential. Therefore, even though many participants read outside of school, teachers should aim to encourage more learners to read, both at school and outside of the classroom, preferably done through a well-balanced reading plan, such as suggested by Nation (2022) (see subsection 2.4.7).

The questionnaire results showed that the participants in general believe that they learn more English vocabulary outside of the classroom rather than when they are at school. 93% agreed that they learn a lot of English vocabulary outside of school (see Figure 6). Additionally, only 25% agreed that they learn most of their English vocabulary at school, while 39% disagreed (see Figure 4). Furthermore, the answers to the open-ended question concerning what contexts they believe they learn new words in English, 90% of the answers included EE activities (see subsection 4.4.4). This contradicts Eide's (2010) findings, where the learners named teachers as the most important factor for language learning. The results that indicate that learners believe they do not learn the majority of their English vocabulary at school may be connected to EE activities as a lot of incidental learning happens through EE exposure. According to Schmitt & Schmitt (2020), several types of extramural exposure have been proved to promote incidental vocabulary acquisition. Furthermore, Webb and Nation (2017) suggest that the great amount of time exposed to spoken input may result in similar encounters with low-frequency words as written input.

6.0 Conclusion

6.1 Main findings

The present study has investigated the English receptive and productive vocabulary sizes of Norwegian 10th graders in lower secondary school. Furthermore, the study has looked at what characterizes the productive vocabulary sizes in terms of lexical richness. An additional aim was to find out how reported exposure to extramural English was reflected in the learners' receptive vocabulary size. Lastly, the thesis aimed to reveal what the learners' beliefs about vocabulary learning were. The research questions were the following:

1. What are the English receptive and productive vocabulary sizes of Norwegian 10th graders?
2. What characterizes their productive vocabulary sizes in terms of lexical richness?
3. How is reported exposure to extramural English reflected in the learners' receptive vocabulary size?
4. What are the 10th grade learner beliefs about vocabulary learning?

Mixed methods were used to answer the research questions, employing an online vocabulary size test to find the receptive vocabulary size, VocabProfiler to analyze written learner texts to estimate the productive vocabulary size, and a questionnaire to investigate exposure to extramural English and map the 10th grade learner beliefs. The research sample consisted of 70 pupils from two different lower secondary schools in Norway.

The average receptive vocabulary size was found to be 7,795 word families, and the average productive vocabulary size was estimated to be 3,386 word families. The findings indicate that the average 10th grade pupil is close to Nation's (2006) estimate of 8,000-9,000 word families needed of receptive vocabulary knowledge to comprehend most written text from a range of genres, such as newspapers or novels, watching a moving or taking part in a conversation. However, the findings suggest that the pupils' productive proficiency is lower than compared to previous studies (Onyszko, 2019; Sætevik, 2018). This calls attention to teaching implications concerning the importance of structuring a well-balanced vocabulary learning process to promote the development of productive vocabulary knowledge, as well as receptive vocabulary knowledge.

To identify what characterizes the productive vocabulary sizes in terms of lexical richness, vocabulary profiles of two pupils each with high-, average- and low receptive vocabulary was measured by lexical variation, lexical density, and number of lexical errors. The findings showed that the high scoring vocabulary profiles had higher type-token ratio than the low scoring vocabulary profiles, showing more lexical variation in their texts. Furthermore, the findings indicated that the texts contained a relatively large proportion of content words compared to grammatical words, suggesting proficient lexical density among the participants. Lastly, several types of lexical errors were found amongst the texts. However, the findings showed that the high scoring pupils had fewer lexical errors than the average- and low scoring pupils.

Regarding the influence of extramural English on the learners' receptive vocabulary size, the findings indicated that the reported exposure to EE activities had a positive influence on the pupil's receptive vocabulary size. However, pupils with high-, average- and low receptive vocabulary size reported rather similar amount of time spent on extramural English activities. Therefore, this may have suggested that the amount of time spent on extramural English activities may not explain the difference in receptive vocabulary size between the pupils with high or low receptive vocabulary size. Nonetheless, as the results show that most of the pupils regularly spend time on extramural activities, the findings may indicate that extramural English exposure correlates positively to the average receptive vocabulary size.

Lastly, the main findings concerning the learner beliefs about vocabulary learning were revealed in the questionnaire. The results indicated that the majority of pupils believe that repetition and practice of vocabulary is important to learn English, which indicates that the pupils value vocabulary as an important element to English language learning. Furthermore, the findings showed that most of the participants believed they learn most of their English vocabulary when they are not at school, in addition to believing that they already know enough vocabulary to express themselves in written assignments at school, despite the average productive vocabulary size being lower than in previous studies.

6.2 Limitations of the study

The main limitation of the present study concerns the low number of participants. The results from a study of 70 L2 learners from 10th grade at two different lower secondary schools from

the same national district may not be used as a generalization and do not represent an overview of the whole population nationally. However, it was not the aim of the study to be able to make any generalization, and rather to serve as a contribution to the limited pre-existing research conducted within the field of vocabulary knowledge at the lower secondary school level in Norway.

Another limitation concerns the duration of the study. The study is conducted based on a single written text from each participant, one online test and the answers from one questionnaire. Considering that the participants only have one opportunity to complete the online test, answer the questionnaire once and have one written text analyzed, the results could change one way or another if the research would be conducted over a longer period of time. This could be done over time with multiple texts, tests and questionnaires to get a better sense, as one-time-results can show a misleading result compared to what the students are able to on a regular basis. If for example three texts from each student were analyzed at different times during 10th grade, the resulted productive vocabulary size could either be used to confirm the productive vocabulary size of a student or even be used to investigate vocabulary growth. Naturally, this process would require more time, which was not achievable in the present study.

Another limitation relates to the text length of the written learner texts. The results may be affected by difference in text length, as certain measures may be sensitive to this, such as the TTR. One way to reduce this limitation, is by cutting the texts so that they are all the same length. However, this was not done in the present study, as it may be challenging to find a natural cutting point in the texts. It may also be argued that valuable productive vocabulary can be cut from the learner texts that may lead to insufficient results.

Furthermore, the findings of the present study considering how reported time spent on EE activities affect receptive vocabulary size could be different if more time had been available. Due to time concerns, the reported time spent on EE activities was an estimate made by each participant themselves. It may not be a precise number, compared to Sundqvist (2009) who used language diaries to log time spent on EE activities. Even more reliable implications regarding EE may have been found if methods such as diaries could have been included.

6.3 Implications for teaching

The findings of the study imply that while pupils may have wider larger receptive vocabulary knowledge, their productive vocabulary size is smaller than in previous studies. Therefore, it is important that teachers implement more focus on teaching that promotes the development of productive vocabulary knowledge. As argued by Schmitt and Schmitt (2020, p. 199), explicit attention to specific vocabulary knowledge is a key element to develop vocabulary and word knowledge in writing. This importance is also supported by Lee (2003) who argues that explicit vocabulary instructions aid learners to adapt receptive vocabulary knowledge into productive use. It is further argued by Schmitt and Schmitt (2020, p. 162) that intentional vocabulary learning is highly beneficial to achieve productive mastery, which should motivate teachers to use teaching methods and materials to encourage productive vocabulary learning.

Furthermore, teachers should be aware of the variation in vocabulary knowledge that can range amongst pupils in 10th grade. As the findings show a gap as wide as 10,000 word families between the pupil with the highest and the pupil with the lowest receptive vocabulary size, the language teaching must account for learners at all proficiency levels. According to Webb and Nation (2017, p. 132), teachers should select teaching materials that cater to learners' needs, to help aid their vocabulary learning. Since vocabulary learning can be complex, teachers should consider several teaching materials as pupils may respond differently to diverse teaching methods.

Another implication to teachers is related to learners' beliefs about vocabulary learning and the influence of EE. Little difference was found between the reported time spent on EE activities between the pupils with high-, average- and low receptive vocabulary size. However, the findings imply that they all spend several hours per day on different EE activities. In addition, the learner beliefs revealed that most of the pupils seem to value vocabulary learning through EE activities rather than at school. Teachers should use this position to try and encourage learning outside of the classroom through incidental vocabulary learning, such as extensive reading. Schmitt and Schmitt (2020, p. 143) argue that frequency of exposure is a key factor in incidental vocabulary learning. Therefore, teachers should always encourage for increasing English exposure both at school and outside of the classroom.

Overall, teachers must be able to create a well-balanced teaching structure to promote vocabulary learning. The Norwegian curriculum (LK20, 2019) mentions both writing and reading as two basic skills that learners are meant to develop within the English subject, which are also included in Nation's (2007) four strands. As the findings of the present study indicate that the learners may struggle to convert receptive knowledge into productive use, it further implies that teaching should focus on finding a well-balanced vocabulary learning process to develop deeper knowledge of vocabulary. By following Nation's (2007) four strands, teachers may find an appropriate balance for vocabulary learning that may help develop both receptive and productive vocabulary knowledge and try to emphasize on converting more receptive vocabulary knowledge into productive mastery.

6.4 Contributions and suggestions for further research

The present thesis aimed to contribute to the field of research on vocabulary size of Norwegian lower secondary school pupils. The thesis can hopefully provide more knowledge of the English receptive and productive vocabulary size of Norwegian 10th graders, as well further contribute to research of how exposure to extramural English can influence receptive vocabulary size. The findings of the present thesis have hopefully highlighted the importance of vocabulary learning in teaching and can encourage teachers to focus on a well-balance structure of vocabulary learning. Additionally, this thesis has aimed to provide contributing findings concerning 10th graders learner beliefs about vocabulary learning.

In terms of further research, there are several recommendations to be made within the field of vocabulary. First and foremost, further research could focus on adding more contributions to research of vocabulary size at lower secondary school. Broader research, including more participants should be done to widening the scope of research. Further research could also include conducting reach over a longer period to be able to measure vocabulary growth. An important focus could also be on the teaching of vocabulary, to try and investigate what kind of teaching methods and materials might be beneficial for vocabulary acquisition. Lastly, further research could study the influence that extramural English exposure has on vocabulary size by having in-depth interviews with students with different vocabulary sizes and reported time spent on EE activities to investigate what activities have a greater influence and why this may be the case.

References

- Bachmann, L. (2004). Linking observations to interpretations and uses in TESOL research. *TESOL Quarterly.*, 38(4).
- Bauer, L., & Nation, P. (1993). Word families. *International journal of Lexicography*, 6(4), 253-279.
- Beglar, D. (2010). A Rasch-based validation of the Vocabulary Size Test. *Language Testing* 27(1): 101-118.
- Beglar, D., & Hunt, A. (2014). Pleasure reading and reading rate gains. *Reading in a Foreign Language*, 26(1), 29.
- Chung, E., & Fung, D. (2023). ‘I realised I only knew the word partly’: student beliefs about vocabulary knowledge and learning in different grades and proficiency levels. *Language Learning Journal*, 51(3), 279-297.
- Cobb, T. (2018). *Why are 95% and 98% underlined on the VP output table?*
https://www.lextutor.ca/vp/comp/cutoffs_blurb.html
- Dörnyei, Z. (2007). *Research methods in applied linguistics: quantitative, qualitative, and mixed methodologies* (p. 336). Oxford University Press.
- Dörnyei, Z., & Taguchi, T. (2010). *Questionnaires in second language research: construction, administration, and processing* (2nd ed. / with Tatsuya Taguchi.). Routledge.
- Eide, M. (2010). *English vocabulary learning with special attention to Norwegian pupils in lower secondary schools*. University of Bergen.
- Elgort, I. (2011) Deliberate Learning and Vocabulary in a Second Language. *Language Learning*, 61(2), 367-413. <https://doi.org/10.1111/j.1467-9922.2010.00613.x>

- Engber, C. A. (1995). The relationship of lexical proficiency to quality of ESL compositions. *Journal of Second Language Writing*, 4(2), 139-155. [https://doi.org/10.1016/1060-3743\(95\)90004-7](https://doi.org/10.1016/1060-3743(95)90004-7)
- Horwitz, E. K. (1999). Cultural and situational influences on foreign language learners' beliefs about language learning: A review of BALLI studies. *System*, 27(4), 557-576.
- Kachru, B. B. (1992). Teaching World Englishes. In B. B. Kachru (Ed.), *The Other Tongue: English across cultures* (2nd ed., p. 355-365). University of Illinois Press.
- Kalaja, P., Barcelos, A. M. F., & Aro, M. (2017). Revisiting Research on L2 Learner Beliefs: looking back and forward. In Garrett, P., & Cots, J. M (Ed.) *The Routledge handbook of language awareness* (pp. 222-237). Routledge.
- Laufer, B., & Goldstein, Z. (2004). Testing vocabulary knowledge: Size, strength, and computer adaptiveness. *Language learning*, 54(3), 399-436.
- Laufer, B., & Hulstijn, J. (2001). Incidental vocabulary acquisition in a second language: the construct of task-induced involvement. *Applied Linguistics*, 22(1), 1-26.
- Laufer, B., & Nation, P. (1995). Vocabulary size and use: Lexical richness in L2 written production. *Applied linguistics*, 16(3), 307-322.
- Lee, S. H. (2003). ESL learners' vocabulary use in writing and the effects of explicit vocabulary instruction. *System*, 31(4), 537-561.
- Leona, N. L., van Koert, M. J., van der Molen, M. W., Rispens, J. E., Tijms, J., & Snellings, P. (2021). Explaining individual differences in young English language learners' vocabulary knowledge: The role of Extramural English Exposure and motivation. *System*, 96, 102402.
- Nation, P. (2006). *How large a vocabulary is needed for reading and listening?* Open Access Te Herenga Waka-Victoria University of Wellington. Journal contribution.

- Nation, P. (2007). The Four Strands. *Innovation in Language Learning and Teaching*, 1(1), 2-13. <https://doi.org/10.2167/illt039.0>
- Nation, I. S. P. (2022). *Learning Vocabulary in Another Language*. Cambridge University Press.
- National Curriculum for Knowledge Promotion 2020. (2019)*. Curriculum in English (ENG01-04). Oslo: Kunnskapsdepartementet. Retrieved from <https://www.udir.no/lk20/eng01-04?lang=eng>.
- Newby, P. (2014). *Research Methods for Education, second edition* (1.st ed.). Routledge. <https://doi.org/10.4324/9781315758763>.
- Nguyen, L. T. C., & Nation, I. S. P. (2011). A bilingual vocabulary size test of English for Vietnamese learners. *RELC Journal*, 42(1), 86-99.
- Onyszko, M. (2019). *Learners' English Vocabulary Size in Upper Secondary School. A study of receptive and productive vocabulary size in Vg1 in Norway*. University of Stavanger, Norway.
- Rea, L. M., & Parker, R. A. (2014). *Designing and conducting survey research: a comprehensive guide* (4th ed.). Jossey-Bass.
- Read, J. (2000.) *Assessing vocabulary*. Cambridge University Press.
- Rindal, U. (2020). English in Norway. In L. M. Brevik & U. Rindal. (Ed.), *Teaching English in Norwegian classrooms: from research to practice* (p. 25-42). Universitetsforlaget.
- Ritchie, J., Lewis, J. & Elam, G. (2003). Designing and Selecting Samples. In L. Maruster & M. J. Gijzenberg. (Ed.), *Qualitative Research Methods* (p. 77-108). London Sage.

- Saunders, M.N., & Townsend, K. (2018). Choosing participants. *The Sage Handbook of qualitative business and management research methods*, 480-494.
- Schmitt, N. (2010). *Researching Vocabulary: A Vocabulary Research Manual*. Palgrave Macmillan UK.
- Schmitt, N., & Schmitt, D. (2020). *Vocabulary in language teaching* (Second edition.). Cambridge University Press.
- Sikt (n.d). *Notification Form for personal data*. Retrieved from 26.02.2024.
<https://sikt.no/en/notification-form-personal-data>
- Skoglund, D. E. (2006). *A Comparison of Norwegian and American Pupils' English Vocabulary Usage in Upper Secondary Schools*. University of Oslo, Norway.
- Sunqvist, P. (2009). *Extramural English matters: Out-of-school English and its impact on Swedish ninth graders' oral proficiency and vocabulary* (Doctoral dissertation, Karlstad University).
- Sundqvist, P., & Sylvén, L. K. (2016). *Extramural English in teaching and learning: From theory and research to practice*. Palgrave Macmillan UK.
- Sætevik, J. (2018). *A cross-sectional study of productive and receptive vocabulary in 8th and 10th grade*. University of Bergen, Norway.
- Watkins, D., & Gioia, D. (2015). *Mixed methods research*. Oxford University Press.
- Webb, S., & Nation, P. (2017). *How vocabulary is learned*. Oxford University Press.
- White, C. (1999). Expectations and emergent beliefs of self-instructed language learner. *System*, 27(4), 443-457.
- Zhong, H. (2018). *The relationship between receptive and productive vocabulary knowledge: A perspective from vocabulary use in sentence writing*. *The Language Learning Journal*.

Appendices

Appendix 1

Questionnaire

Engelsk vokabular

Denne spørreundersøkelsen handler om elevers bruk og møte med engelsk utenfor skolen, i tillegg til deres tanker om engelsklæring. Svarene fra denne spørreundersøkelsen vil anonymiseres, og vil ikke ha noe påvirkning på karakteren i faget.

Din kode:

Hvilke av følgende sosiale medier bruker du?

- TikTok
- Instagram
- Twitter
- Facebook/Messenger
- YouTube
- Snapchat
- Discord
- Twitch
- Ingen av de nevnte
- Andre sosiale medier

Er innholdet du ser på sosiale medier noen ganger på engelsk?

- Veldig ofte
- Ofte
- Av og til
- Sjeldent
- Veldig sjeldent/aldri

Hvor mange timer per dag bruker du på sosiale medier hvor du leser eller hører engelsk språk?

- 5 timer eller mer
- 3-4 timer
- 1-2 timer
- Under 1 time
- Ingenting

Hvor mange timer per dag ser du på TV-serier eller filmer med engelsk tale? (På TV eller strømmetjenester som Netflix, Disney+, HBO-max, osv.)

- 5 timer eller mer
- 3-4 timer

1-2 timer
Under 1 time
Ingenting

Hvor mange timer per dag hører du på musikk med engelsk tale?

5 timer eller mer
3-4 timer
1-2 timer
Under 1 time
Ingenting

Hvor mange timer per dag hører du på lydbok med engelsk tale?

5 timer eller mer
3-4 timer
1-2 timer
Under 1 time
Ingenting

Hvor mange timer per dag hører du på podkast med engelsk tale?

5 timer eller mer
3-4 timer
1-2 timer
Under 1 time
Ingenting

Hvis du driver med gaming (f.eks. PC-spill, Playstation, Xbox, eller andre spillplattformer), hvor mange timer per dag spiller du spill hvor du leser eller hører engelsk tekst eller tale?

5 timer eller mer
3-4 timer
1-2 timer
Under 1 time
Spiller ikke i det hele tatt

Du vil nå få presentert en rekke påstander. Din oppgave er da å velge alternativet som best passer hvilken grad du selv er enig i de forskjellige påstandene, fra å være veldig enig, til å være veldig uenig.

I hvilken grad er du enig i følgende påstander:

Jeg har lært det meste av mitt engelske ordforråd på skolen.

Veldig enig
Enig
Verken enig eller uenig
Uenig

Veldig uenig

Det er nødvendig å forstå engelsk-språklig kultur for å kunne lære seg engelsk språk.

Veldig enig

Enig

Verken enig eller uenig

Uenig

Veldig uenig

Det er enklere å lære seg et nytt språk for de som allerede kan flere språk.

Veldig enig

Enig

Verken enig eller uenig

Uenig

Veldig uenig

For å lære seg engelsk er det viktig med repetisjon og øving av vokabular.

Veldig enig

Enig

Verken enig eller uenig

Uenig

Veldig uenig

Den beste måten å utvide ordforrådet sitt på er å lese mye.

Veldig enig

Enig

Verken enig eller uenig

Uenig

Veldig uenig

Man vil få et større engelsk ordforråd av å bo i et engelsk-språklig land over tid.

Veldig enig

Enig

Verken enig eller uenig

Uenig

Veldig uenig

Det er vanskelig å lære seg å bruke nye engelske ord.

Veldig enig

Enig

Verken enig eller uenig

Uenig

Veldig uenig

God hukommelse er viktig for å lære seg nye engelske ord.

Veldig enig
Enig
Verken enig eller uenig
Uenig
Veldig uenig

Jeg lærer for det meste nye engelske ord ved å forstå dem ut fra muntlig sammenheng.

Veldig enig
Enig
Verken enig eller uenig
Uenig
Veldig uenig

Jeg lærer for det meste nye engelske ord ved å forstå dem ut fra skriftlig sammenheng.

Veldig enig
Enig
Verken enig eller uenig
Uenig
Veldig uenig

Jeg mener at jeg hovedsakelig lærer nye ord på engelsk ved å plukke dem opp, av meg selv, uten å pugge de.

Veldig enig
Enig
Verken enig eller uenig
Uenig
Veldig uenig

Jeg mener at jeg hovedsakelig lærer nye ord på engelsk ved å pugge de.

Veldig enig
Enig
Verken enig eller uenig
Uenig
Veldig uenig

Jeg synes det er lettere å lære nye engelske ord ut fra sammenhengen når det er med bilde/lyd og bilde.

Veldig enig
Enig
Verken enig eller uenig
Uenig
Veldig uenig

Jeg lærer mye engelsk vokabular utenom skolen.

Veldig enig

Enig
Verken enig eller uenig
Uenig
Veldig uenig

Jeg snakker engelsk utenom skolen. (For eksempel med venner, familie, på sosiale medier, osv.)

Veldig enig
Enig
Verken enig eller uenig
Uenig
Veldig uenig

Jeg bruker/foretrekker norske undertekster når jeg ser på engelskspråklige TV-serier/filmer.

Veldig enig
Enig
Verken enig eller uenig
Uenig
Veldig uenig

Jeg bruker/foretrekker engelske undertekster når jeg ser på engelskspråklige TV-serier/filmer.

Veldig enig
Enig
Verken enig eller uenig
Uenig
Veldig uenig

Jeg leser engelske bøker utenom skolen.

Veldig enig
Enig
Verken enig eller uenig
Uenig
Veldig uenig

Jeg leser engelske bøker på skolen.

Veldig enig
Enig
Verken enig eller uenig
Uenig
Veldig uenig

Jeg leser engelske nyheter.

Veldig enig

Enig
Verken enig eller uenig
Uenig
Veldig uenig

Om undervisning på skolen

I hvilken grad er du enig i følgende påstander:

Vi har gloseprøve på skolen.

Veldig ofte
Ofte
Av og til
Sjeldent
Veldig sjeldent/aldri

Vi bruker Quizlet på skolen til vokabularlæring.

Veldig ofte
Ofte
Av og til
Sjeldent
Veldig sjeldent/aldri

Vi bruker Quizlet på skolen til å teste nye ord vi har lært.

Veldig ofte
Ofte
Av og til
Sjeldent
Veldig sjeldent/aldri

Vi lærer på skolen hvordan vi kan forstå nye ord ut fra sammenhengen.

Veldig enig
Enig
Verken enig eller uenig
Uenig
Veldig uenig

Jeg kan nok vokabular til å uttrykke meg presist når jeg har skriftlig skolearbeid.

Veldig enig
Enig
Verken enig eller uenig
Uenig
Veldig uenig

Jeg trenger å lære mer vokabular for å uttrykke meg presist når jeg har skriftlig skolearbeid.

Veldig enig

Enig

Verken enig eller uenig

Uenig

Veldig uenig

Refleksjonsspørsmål

I hvilke sammenhenger lærer du nye ord på engelsk?

Reflekter rundt hvordan du mener du lærer nye ord på engelsk. (Eksempelvis, i undervisningen på skolen, fra familien din, vennene dine, via sosiale medier, på egenhånd, en blanding av flere av disse og mer, osv.)