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# DEVELOPING AN ONLINE LEARNING PLATFORM FOR STUDYING FINNISH

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**Abstract**


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Developing an online learning platform for studying Finnish

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The thesis discusses the structure and design of online learning platforms and creating a prototype of a Finnish language learning website. The thesis follows the four steps of the product development process: exploration, creation, reflection and implementation. The thesis applies both quantitative and qualitative research methods. The data was collected through an online survey, benchmarking and user testing. The data was analyzed by cross-tabulation, word frequency analysis and categorization.

Key findings of the research show that the interface of a language learning website should be clear and simple with three to four colours. The website should include many interactive and visual elements to track personal progress and encourage users. The lesson page should be broken into sub-categories for better content organisation and should include materials in video and text format, resources with home assignments and links to additional resources. A course page should contain detailed information about course structure and how to work during the course as well as links to social media channels and group discussions.



Keywords

Product development, Online language learning platform, Online learning, User research, Design-based research

CONTENTS

# LIST OF ABBREVIATIONS

CTA button – call-to-action button

MVP – minimum viable product

GDPR – general data protection regulation

VR – virtual reality

AR – augmented reality

LMS – learning management system

LCMS – learning content management system

MOOC – massive open online course

ECTS – european credit transfer and accumulation system

UX – user experience

# 1 INTRODUCTION

## 1.1 Project background

Online learning market expected to grow 32% by 2022 (Statista 2015). Thousands of people every year decide to study online due to convenience and flexibility. Currently, the most popular reasons for choosing online over offline are existing commitments, employer incentive or partnership, specific area of interests and reputation of the educational institution. (BestColleges 2019, 9)

Currently, many businesses and educational institutions provide online courses via educational platforms. These platforms vary by teaching methods, user interfaces, usability, content, and prices. When choosing a course in 2018, most of the participants rely on online reviews (19%) and information on the educational institution's' website (15%) (BestColleges 2019, 13).

Even though the cost of service is the biggest concern the students face, defining the quality and the compliance requirement is the second most important thing.

The quality of education relies on the usability of a platform. Research on the usability of the learning platform is currently in high demand. The aim of the research is to define the interconnection between the online learning platform and the education process or in other words, how the user experience and satisfaction could affect the education process (Harrati, Bouchrika, Tari & Ladjailia 2016, 464.)

Usually, an online learning website does not have a teacher who is available 24/7. Therefore, the online learning website should have a well-thought-out structure so that a user can understand the material and go through the whole course effectively and efficiently. Even though the quality of educational materials is exceptionally vital, user experience plays a significant role for educational-based learning platforms (N. Harrati et al. 2016, 470).

Thus, the structure of the materials and the way of their presentation, for instance, pleasant usability, are also crucial for the educational platform development. An academic dissertation "Designing a Mobile Learning Framework for a Formal Educational Context" written by Jenni Rikala discusses the opportunities and issues of mobile learning. It shows three steps of designing the mobile learning framework. (Rikala 2015.) The research proves the relevance of the current research topic. However, the main reasons for starting to conduct the present study rise from the small spread of the Finnish language

comparing to the other languages (Lopez 2015) and the attractiveness of the opportunity to popularise both Finnish language and culture.

The working title of an online learning platform for the thesis is Neiro Lingua. At the time of writing the thesis, Neiro Lingua is not yet registered as a company. However, an online learning platform with the Finnish language courses could be developed and implemented in the future.

## 1.2 Research objectives, questions, and limitations

The idea of Neiro Lingua website appeared in 2017. The idea belongs two people willing to test their method of Finnish language learning and language skills acquisition with non-Finnish speaking people as well as develop the minimum viable product (MVP) of the website and perform a usability test.

The main research question is:

- What functions and requirements should be implemented on a language learning website?

The following subordinate research questions help narrow down the main research question:

- What are the most popular types of study materials and how should they be organised on a lesson page of a language learning website?
- What kind of layout design is the most suitable for a language learning website?

Our research has some limitations. This research is aimed at the language courses' requirements and may not be applicable to other types of online learning courses. Also, the research is not about teaching methods, and it is significant to emphasise that all the lessons materials are supplied by the professional teacher.

An expected outcome is creating a demo website that offers a Finnish language learning lesson. The website includes the landing page with a call-to-action button, set of pages that shows how the materials for a single lesson are arranged, as well as the basic scenarios of user interaction with the service passing the lesson, navigation, providing feedback.

## 1.3 Thesis structure

The thesis consists of seven chapters and describes the online platform development process. The chapters are:

1. Introduction
2. Methods and research ethics
3. Product development process
4. Teaching and learning languages online
5. Results and key findings
6. Implementation
7. Conclusion

Chapter 2 describes the research approach, in particular, discusses qualitative and quantitative research methods with the examples of its implementation in the thesis. Following sub-chapter describes how the data is going to be collected. After that, the data analysing methods reviews cross tabulation, word frequency analysis, categorisation. The last sub-chapter of Chapter 2 includes ethical principles of how to conduct research.

Chapter 3 refers to the product development process. It describes the theoretical aspects of the product development process break by four stages – exploration, creation, reflection and implementation. Moreover, Chapter 3 presents a description of practical examples for the development of an online language learning platform.

Chapter 4 is devoted to online learning platforms. It observes academic sources to describe the components of the effective and efficient online language learning process. Chapter 4 presents the types of online language learning platforms, its differences and similarities.

Chapter 5 includes research data and its analysation. The survey and its key findings provide information about the previous experience of the online learning platform usage. Benchmarking analysis compares different existing online language learning platforms. The results of benchmarking reveal the advantages and disadvantages of existing online solutions. The last sub-chapters of Chapter 5 describes the usability test. The test was conducted with two focus groups who tested the prototype. The result of the usability test is an improvements basement of the online learning platform prototype.

Chapter 6 refers to the prototype's modifications based on the key findings from the previous chapter. Chapter 6 also discusses possibilities for further developing of the learning platform and the grounds why they could not be implemented immediately.

Chapter 7 presents the answers to the research questions and suggests the ideas for further research.

# 2 METHODS AND RESEARCH ETHICS

This chapter introduces the research problem, research questions, and objectives.

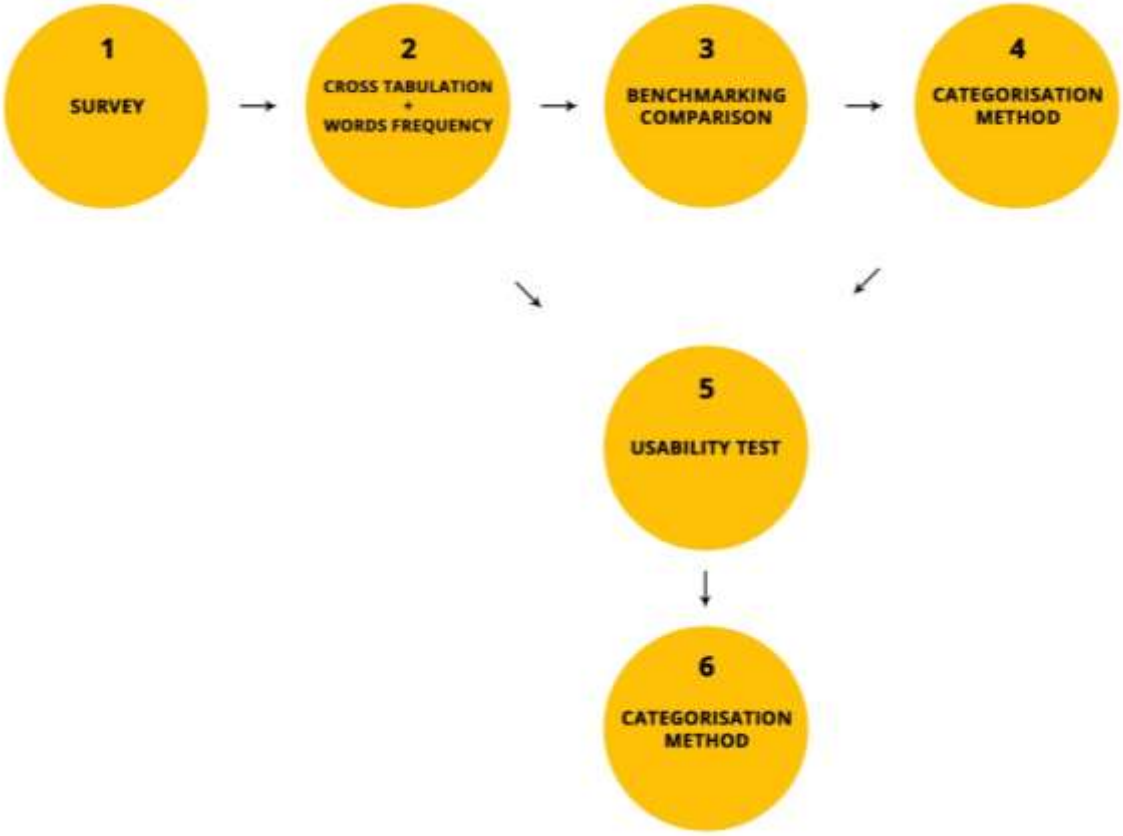


Image 1 The process of data collection and data analysis

## 2.1 Qualitative and quantitative research

The thesis applies both a qualitative and quantitative approach. Qualitative approach is aimed at collecting people experience and behavior by observing. Results of qualitative approach may describe a human's opinion and feelings about a research topic. Usually, the methods of qualitative approach are interviews and focus groups. Quantitative approach is based on real numbers and statistics data. Usually, the sample size of quantitative research is larger than the number of people in qualitative approach. (Monfared & Derakhshan 2015, 1.)

In practice, qualitative and quantitative methods of the research are used together to obtain more meaningful data. The difference between the methods is oversimplified, as a combination of both seems to be relevant as well. Thereby, the combination of the methods granted more opportunities:

- Corroboration – the deliverables of the qualitative and quantitative methods prove the same.
- Elaboration – the numbers highlight the ideas defined by the qualitative method.
- Complementarity – different outcomes of the qualitative and quantitative methods impart the bigger picture of the problem.
- Contradiction – the deliverables of the qualitative and quantitative methods prove the opposite. (Brannen 2007, 176.)

In this thesis, the aim is to follow the complementarity combination of qualitative and quantitative approaches. With the support of quantitative data to design a more sophisticated study to collect qualitative data.

## 2.2 Data collection

The first step of data collection is a survey. A survey is a collection of well-structured questions that helps get an overall idea of the problem and to define topics to focus on. A survey admits receiving a large number of responses in a short term of time. A survey in most cases self-administrated, meaning that an interviewer is not involved in the process.

In the thesis, contacting people who recently participated in any online courses decreases the error level (Lazar, Feng & Hochheiser 2017, 105-112). The survey in the thesis consists of the open-ended questions and close-ended questions with unordered response categories. The open-ended questions provide more opportunities to share personal opinions and experience. The unordered close-ended questions let users choose from the set of options. (Lazar et al. 2017, 119-120.)

Benchmarking is used as the second step of data collection. Benchmarking, in general, is the process of comparing products, services or operations of one organisation with those of another organisation. The purpose of the comparison is to search for improvements in the aspects that are being examined. Benchmarking is a source of the best practices of other companies to be adopted for the specific case. (Stapenhurst 2009, 4-5.)

For qualitative comparison, it is necessary to define the boundaries of the comparison criteria or processes performed by the operation, and the level of performance of the methods and other parameters characterising the work. In this thesis, competitive benchmarking is applied. The comparison is made with direct competitors (for the products or services provided) operating in the same market segment. To obtain more relevant results,

you should choose competitors who are on a different “level” of the market. (Stapenhurst 2009, 90-91.)

The final step in data collection is a usability test. The usability test is a user research method. The aim of the method is both to find areas to improve in a product or an interface and to find if the interface design affects the platform usage from users perspective of view. Three types of usability testing exist: (a) expert-based usability testing, when the expert checks the usability of a product and determines issues, (b) automated based testing utiles with the help of several digital solutions to appraise a product, and (c) user based usability testing, when users attempt to do a set of task to define flaws-areas. In addition, the usability tests that are held on at the early stages of product development, it is crucial to pay attention to the qualitative data. (Lazar et al. 2017, 263-289.)

## 2.3 Data analysis

The data received from the survey will be analysed with the help of (a) cross-tabulation for unordered close-ended questions and (b) word frequency analysis for open-ended questions. The data received from the usability test will be analysed with the help of categorisation method.

Cross-tabulation is a process of combining two (or several) frequency tables so that each cell in the constructed table is represented by a single combination of values or levels of tabulated variables. Crosstab allows combining the frequency of occurrence of observations at different levels of the factors under consideration. By exploring these frequencies, it is possible to identify the relationships between tabulated variables and examine the structure of this relationship. Crosstab has usually tabulated categorical or quantitative variables with a relatively small number of values. (Banasiewicz 2013,164.)

Word frequency analysis helps to determine the word’s usage frequency within the given text. Outcomes provide the possibility to compare the number of times the word is used to the total number of words. (Hsieh & Shannon 2005, 1284-1285.) In the present thesis, the method lets identify similarities in the respondents’ suggestions.

The data collected during the benchmarking analysis and usability test is process with the help of categorisation method. Categorisation is a powerful tool for grouping information to compare when the direct comparison is not applicable (Jonathan Lazar et al. 2017 114-115). According to Stapenhurst (2009, 134) the benefits of categorisation analysis in benchmarking are for product comparison when there are enough information to compare and the categories exists. It means that the categories can not be significantly simplified, because it loses some of the meaning invested in the response of the respondents. Also,

and vice versa, it is impossible to make too narrow categories containing one or two concepts, since the data structure remains cumbersome.

The categorisation method for usability tests used to analyse qualitative data represented by text. For example, answers to free questions, where the respondent answers independently, formulating the response in his own words. For the qualitative performance of this kind of analysis, it is necessary to understand the problem under study and its conceptual apparatus, since it is based on direct work with the semantics of answers, that is, the meanings of words and word combinations. (Hsieh et al. 2005, 1277–1279.)

## 2.4 Research ethics

The chapter discusses the fundamental principles of how to conduct the research. Survey, usability test questions and all the received results of the thesis meet the principles of responsible conduct of research and ethical principles such as honesty, objectiveness, accuracy, intellectual property rights, confidentiality, non-discrimination (Resnik 2015). All data, analyses, results and findings are honest without falsification, bias and subjective opinion.

The thesis does not violate copyright and excludes plagiarism. The minimal quantity of quotes is direct quotations. The mentioned sources are in the list of references. These sources are scientific articles, books or statistical researches.

Regarding general data protection regulation (GDPR) and “Ethical recommendations for thesis writing at universities of applied sciences” (Arene 2017, 10), the confidentiality principle, as well as non-discrimination principle, are followed. All research data are collected from anonymous users. No name, IP, age or other personal information is stored or published. Results of the research are accumulated and summarised whole data in one impersonal table. The identity of a person can not be determined on the results of the research.

# 3 PRODUCT DEVELOPMENT PROCESS

The project focuses on human-computer interaction. Human-computer interaction is a study of how to create, which includes but is not limited to design, develop and implement, digital solutions and all the questions around the process (Ghaoui 2005, 25). Thus, design studies were defined as a relevant one to rely on to develop the research. For instance, Schneider and Stickdorn (2011, 118) examine in detail four stages of the product development process. This process consists of the set of iterated steps which help to transform ideas to real services or goods (Susterova, Lavin & Riives 2012, 0225). The four stages are exploration, creation, reflection, implementation (Image 2). At each step, they sort out the most suitable research methods that they can give. Moreover, the book contains several real projects with a consistent description of the research methods used.

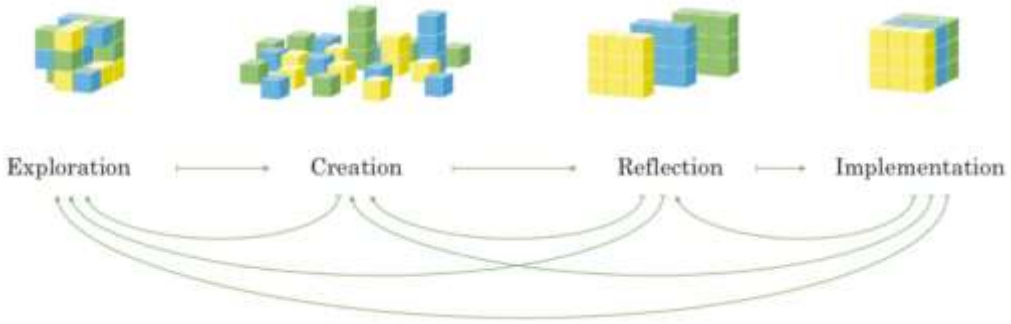


Image 2 Stages of the product development process (Koljonen 2012, 14)

Besides, for a better understanding of a product development process, the different studies were examined. Some of them give hints for finding and attracting the audience to the research and the steps needed for receiving trustful results (Kolko 2013, 80-81; McGinn & LaRoch 2014, 62-65). Others explain the basics principles of human-computer interaction design (Whittake 2013, 38-42).

## 3.1 Exploration

A service designer controls the stage and analyses the business from the point of view of the launch of a new process or product. The exploration stage serves three tasks: getting acquainted, identifying a problem, and visualising findings.

- Getting acquainted means getting knowledge about the company, its work processes, culture and vision. It is important to understand if the company is ready for the modernisation and introduction of new processes, what is stakeholders' point of view.

- Then a service designer identifies existing issues and researches potential solutions of them. The most important part of the step is to rely on the pain points of the users. A service designer measures the relevance and prioritise the pain points and chooses solutions based on the outcomes.
- The last step of discovering is visualisation where key findings are provided to stakeholders and developers to understand the structure of future service and current problems. (Schneider and Stickdorn 2011, 121.)

The realisation of the exploration stage of the product development process is described in the project background part. The idea of creating an online learning platform appeared due to a small spread of the Finnish language and in this regard, the lack of a suitable online learning platform.

## 3.2 Creation

The result of the stage is the creation of the concept and collecting ideas for a new service. All findings that were gathered on the first stage are processed. All interests participate in the process, which may include many iterations, the number of which depends on the number of emerging issues and their solutions. The more mistakes are found and prevented on this stage, the less money and time will be spent on developing and retesting. (Schneider and Stickdorn 2011, 122.)

A useful tool for collecting ideas is sticky notes. It helps to visualise relationships between objects, processes, and stages in the whole. This tool is used actively on brainstorming and other sessions in work teams. (Schneider and Stickdorn 2011, 123.) Another tool of collection ideas and features of the future service is benchmarking. It provides an understanding of how products in the same niche are designed. The main idea is to defined how to solve the same problems and what is the best way to integrate similar solutions.

The thesis' results of the creating stage are the survey and benchmarking. According to Ozok (2009, 254), a survey can be used to collect users' opinions. This approach lets capture a bigger picture, as the survey in the thesis aims to find out what are the most common requirements according to the users' of online learning platforms. In particular, the survey aims to find out what kind of lesson content and platform structure are the most familiar to the respondents. The best practices, as discussed by Fitzpatrick (2013, 11-47), were applied. The survey questions should refer to the previous respondents' experience, and hypothetical questions should be avoided. The survey was designed using Google Forms. It contains three main parts: general questions, questions related to the lesson content and course structure, and questions related to additional sources (Appendix 1).

The first part makes it possible to delimit the target audience to students, full-time workers and unemployed and to define the complexity of the materials. It also provides the possibility to separate respondents who have not participated in online courses recently with the help of a “contingent question”. Babbie (1990) notes that the question divides the users based on the answer: those who answer positively continue the survey; others finish it (Lazar et al. 2017, 123). The second part gives hints about layout design. It helps to find out what kind of materials are more used nowadays. The third part defines the most popular sources that could be excellent and familiar supplementary sources to the target audience. The last part is a thank you section.

The survey had been first tested among 14 participants during the thesis preparation courses. In the thesis, the questions were adjusted to suit the needs of the research. The survey with the description was sent to the Udacity community through a Slack channel, to Lahti UAS community through a university intranet (Yammer), and through different social media channels. All the responses were stored to a Google Sheet document. (Appendix 1.1).

On the survey results ground online learning websites are chosen for benchmarking. Each website was examined on the speed, contrast of the colors, layout design, navigation, lesson structure and content of a single lesson. The summary table and key findings (see section 5.4) let define the critical features for the next step of the development process.

To sum up, the structure of the future online learning platform is based on the survey and benchmarking of websites. The website is created based on the identified advantages and user wishes and excludes disadvantages found in both the survey and the benchmarking.

## 3.3 Reflection

The creation of a prototype and getting feedback are going on the third stage. Marc Stickdorn emphasises the importance of developing a realistic prototype. Video, photos, presentations of a new product or service is better than a text description. But during the testing stage, an interactive prototype grants the ability to make the usability test as close to the real conditions as possible. Having a prototype engages users into testing and allows to get more valuable and actual feedback about the project, its usability, and content. The creation stage may have many iterations. Every iteration is based on tests and result of the previous one. (Schneider and Stickdorn 2011, 124-125.)

The prototype of the online learning platform is a website. The interactive website, which includes all the prepared materials as well as graphical design, helps to provide the focus group with a clear vision of the product, explains ideas correctly.

According to authors (2011, 124), evaluating the prototype is always more convenient than read through the description. In the future, it helps to show a statement of the problem for developers, as almost any interface problem allows for a vast number of solutions. The prototype helps to avoid misunderstandings and to split tasks easier. Second, the prototype allows conducting usability testing and identify potential problems. (Schneider and Stickdorn 2011, 125.)

In the thesis, the result of this stage is a website prototype and its usability testing. The website satisfies the principle of a minimum viable product. The principle means that a project is developed with minimum effort to collect as much knowledge of customers, their behavior and assessment of a service as possible (Lenarduzzi & Taibi 2016, 1).

Usability testing helps to define possible gaps and interface problems, and unaccounted scenarios as well as making corrections at this stage is less resource-intensive (Lazar et al. 2017, 264). The key idea is to ask a focus group to find as many problems as possible. Participants are being observed during the test. It allows to notice things that the focus group members take for granted. The questions to be asked during the test refers to the prototype interaction. Users should (a) to find the lesson from the main page and (b) to interact with the lesson page.

The website prototype is tested with two focus groups: group A and B. The number of focus groups needed for a study varies. The minimal number is two focus groups of five people each (Lazar et al. 2017, 204). We decided to increase the number of participants. Thus, group A consists of seven people who have little experience in studying Finnish language and some language background. Group B has seven people who use Finnish language daily, but they are not native speakers. The whole focus group meeting takes no longer than forty-five minutes and includes an introduction, a test and a brief discussion. During the test, a list with general and specific questions are provided to mark observations. The general questions clarify a level of Finnish of the target audience, while the more specific questions provide more information about the advantages and disadvantages of the prototype.

## 3.4 Implementation

The last stage of the product development process is the final release. The product or service becomes public. The usual practice of the product development process is to repeat

iterations of discovering, creating, reflection and implementation stages. Each stage may also have its own set of iterations. (Schneider and Stickdorn 2011, 126.)

The prototype of the online learning platform is improved based on the results of the usability test. Some improvements based on the insides could be implemented and tested not in the second iteration of product development.

# 4 TEACHING AND LEARNING LANGUAGES ONLINE

In the thesis, we develop an online language learning platform. Therefore, the aim of the chapter is to present, discuss and define the concept of online learning and general practices. It also discusses materials or resources that are used for online teaching, and types of the online learning platforms and their distribution during the previous years.

The chapter discusses the common structure of online courses and the types of materials used in online language learning courses. Moreover, the types of existing online platforms and their characteristics will help to define the exciting opportunities and problems.

## 4.1 Online learning

The term "online learning" is related to the definition of "e-learning" by Börje Holmberg (2005, 9) in “The Evolution, Principles and Practices of Distance Education”. It should be noted that Holmberg (2005, 9) incorporates the concept of e-learning into a broader definition of distance learning. It allows us to formulate the basic principles of online learning:

- The education process is carried out using a particular medium and without interpersonal communication.
- Channels are used for transmitting mediated information, for example, written communication, audio and video data transmission.
- Asynchronous or synchronous type of interaction, or the mixture of both types is chosen for the learning process. This means that students either have access to pre-prepared study materials (asynchronous type) or interact with the course provider (synchronous type). Students can also interact with each other.
- Digital solutions and electronic equipment are used in the education process. (Holmberg 2005, 10-11.)

In the present project interaction between students will be missed due to the technical limitations.

## 4.2 Online language teaching

Epignosis LLC study (2014, 17) helps us to understand that online teaching methodology varies depending on age, the character of learners, type of materials. During the past years, technological development – e.g. cloud storage, online quizzes, video and audio tools, online conferencing tools, collaborative tools, and virtual reality (VR) and augmented reality (AR) – have taken learning to a new level.

An effective and efficient language learning process could not exist without four main aspects – reading, writing, listening and speaking. Thus, when creating online courses, it is important to focus on the balance between students' individual work and group or pair work as well as language work and communication skills (Hockly & Clandfield 2010, 31).

For successful online language teaching, the authors suggest implementing any of the following five main activities based on Hockly et al (2010, 31-33):

- **Introductory activities** help to establish communication between teachers and students, to understand the methods of work and to set goals of the course. Thanks to them, the level of communication between students and their motivation is increased.
- **Reading and writing activities** are grouped as their combination makes the collaboration between the student stronger.
- **Listening and speaking activities** are the most challenging part due to the absence of interpersonal communication.
- **Language focus and evaluation activities** gain the opportunity to use the gained knowledge into the close to real-life facilities as well as improve stylistics and composition skills.
- **Activities for the end of a course** allow reflecting on the work process, achievements and issues. The important part is to receive feedback and consider further development.

In order to hit the target in the above mentioned activities the authors suggested to implement the features such as blogs, chat, guest maps, shared whiteboards, word clouds and use such tools as mind maps, quiz makers, screen capture tools, sound recorders, survey sites, video sharing sites, soundboards and provide access to concordance sites, comic creator sites, movie creator sites, online music players or podcasting sites, poster sites, slideshow sites, and subtitle creation sites. (Hockly et al. 2010, 21-26.)

Moreover, when developing online language courses, it is good to implement additional tasks that amplify users' engagement (Hockly et al. 2010, 33).

## 4.3 Types of platforms for online language learning

First online courses appeared in the 1990s. One of the early adopters was the Open University in the United Kingdom. Since that time, several types of online platforms have been created. The most popular types of platforms are:

- Learning Management Systems (LMS)
- Learning Content Management Systems (LCMS)
- Massive Open Online Courses (MOOCs)
- Online learning communities
- Mobile applications

**Learning Management Systems** are mostly used by educational organisations. Every course has a publisher(s) who posts listening, reading, writing and speaking materials as well as checks assignments, make reports and transmits online webinars. It makes learning process more automated. (Ghirardini 2012: 118-119.)

**Learning Content Management Systems**, which are mainly content focused LMS, provide a learning content dynamically based on results of input tests. LCMSs allow to content provider(s) make materials more personalised. (Ghirardini 2012: 119-120.)

**Massive Open Online Courses** is a type of online learning platform that offers courses developed by different universities or companies and attracts people from all over the world. The courses' range varies and corresponds to every level of education. However, if in the LMS and LCMS the course developers are responsible for the evaluation and european credit transfer and accumulation system (ECTS) grant, the MOOCs' traditionally have more similarities with the 'classical' academic courses and the outcome is a certificate. (Martin-Monje & Barcena 2014: 1-2.) Nowadays such platforms as Udacity, Coursera, and EDx provide thousands of online courses for free or based on a subscription model.

**Online learning communities** are websites or platforms which unite different people who would like to share their knowledge. The participants are freelance teachers who, for example, teach foreign languages. The teachers organise online classes, rate and review participants' work. (Hockly 2015, 4.)

The use of **mobile applications** for educational purpose is growing fast. The number of users is expected to be 4 million by 2020 (Statista 2016). Language learning mobile applications include quizzes and exercises aimed to enrich vocabulary and improve language skills. At the same time, mobile applications market growth brings validation difficulties to teachers and students. (Deng & Trainin 201, 50)

The number of enrollments to online courses in The United States increased by 17.2% from 2012 to 2016 (Seaman, Allen & Seaman 2018, 12).

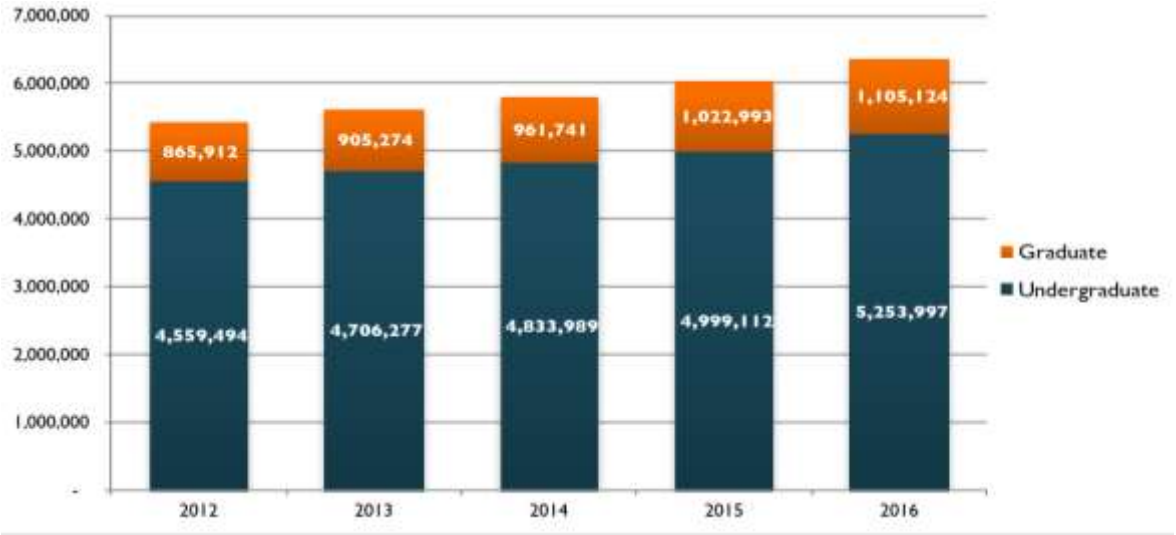


Figure 1 Students taking distance courses by level (2012-2016) (Seaman et al. 2018, 12)

At the same time, the number of enrollments to face-to-face courses decreased. The overall percentage of students who took at least one online course in fall 2016 was 31.6% of all enrollments (Seaman et al. 2018, 11). In 2017, 78% of the United States companies used an LMS (eLearning Industry 2017).

# 5 RESULTS AND KEY FINDINGS

This chapter moves on to discuss the product development process steps discussed in Chapter 3. Thus, Chapter 5.1 introduces the survey, Chapter 5.2 discusses the analysed survey results and shows the key findings of the survey. Chapter 5.3 introduces the observations made during the benchmarking. Chapter 5.4 presents categorised results of benchmarking. Chapter 5.5 explains how the MVP was created. Chapter 5.6 introduces the usability test, Chapter 5.7 discusses the analysed usability test results and shows the key findings.

## 5.1 Survey

The aim of the survey is to define the most common requirements to the online learning platform structure: its lesson content and layout. The survey was designed using Google Forms. It contains three main parts: general questions, questions related to the lesson structure, and questions related to additional sources. The survey was open from 2018-3-30 to 2019-3-19. During the time, one hundred people have answered.

Relatively the same number of men (44%) and women (55%) responded while 1% preferred not to answer. As Figure 2 shows, when asked about their current occupation, respondents could choose several options. One hundred respondents answered in total. However, around ten respondents had chosen several options, and we received 118 different answers. Most of the respondents were students (52.2%), followed by full-time workers (18.6%), part-time workers (16.1%) and unemployed (12.7%). The first part of the survey ends with a question “Do you have any online courses at the moment or did you have any recently?” (Appendix 1). Respondents who answered negatively, did not participate in further survey. Thus, only 72 respondents participated further.

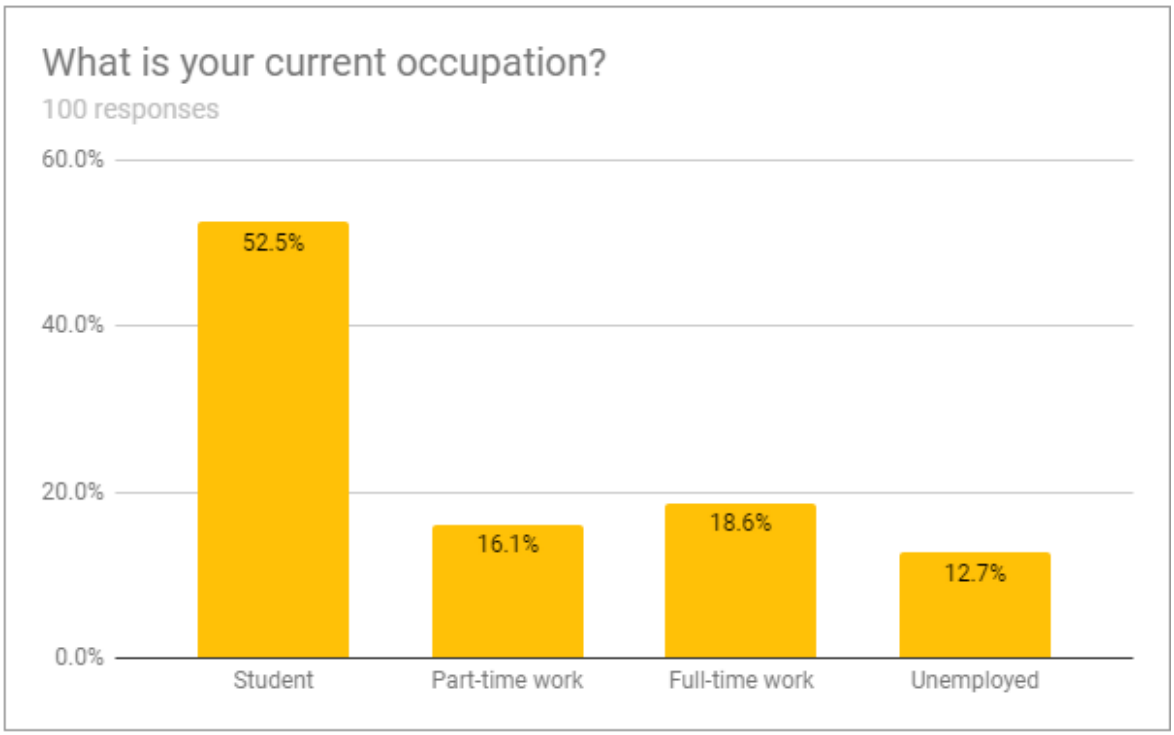


Figure 2 Occupation of respondents (a multiple-answer question)

Figure 3 illustrates the amount of time spent studying in a week. According to the answers, 59.7% of respondents spend up to four hours per week studying, of which fourteen respondents (19.4%) and twenty-nine respondents (40.3%) spent less than two hours and two to four hours for online courses respectively. At the same time, the smallest group (18.1%), thirteen respondents study from four to six hours weekly. Sixteen respondents (22.2%) spent more than six hours weekly for online courses.

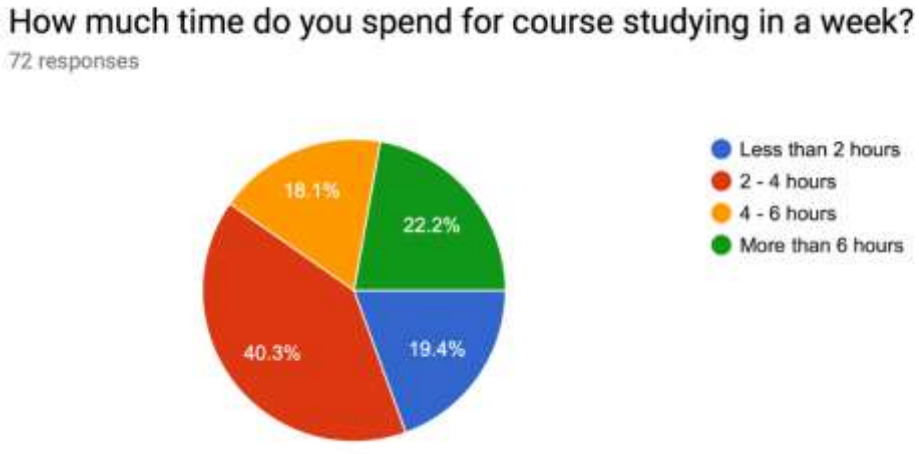


Figure 3 Amount of time spent for a course studying in a week

Figure 4 summarises what kinds of study materials were considered useful, where the respondents could choose more than one option. The most popular types of the materials

provided on the course pages are a theory in video form (58 responses), theory in text form (56 responses), home assignments (43 responses), group discussions/social media channels (36 responses). The respondents found presentation(s) (30 responses) and references to additional information (26 responses) to be less useful. Self-check home assignment (20 responses), mentor's help (18 responses) and webinars with a teacher (15 responses) could be defined as additional services. The interesting outcome from the free text answer is to make vocabulary tests.

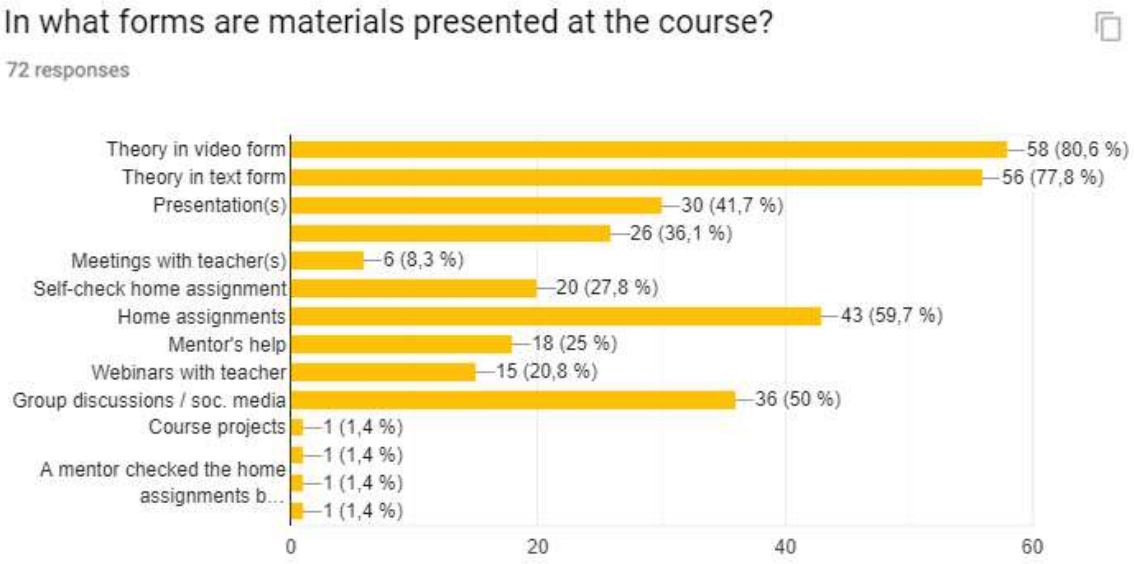


Figure 4 Types of study materials

As Figure 5 shows, a total of 93.1% of the respondents (67) have attended courses divided into blocks. From them, 75% or 50 respondents have participated in courses divided into small blocks according to specific topics.

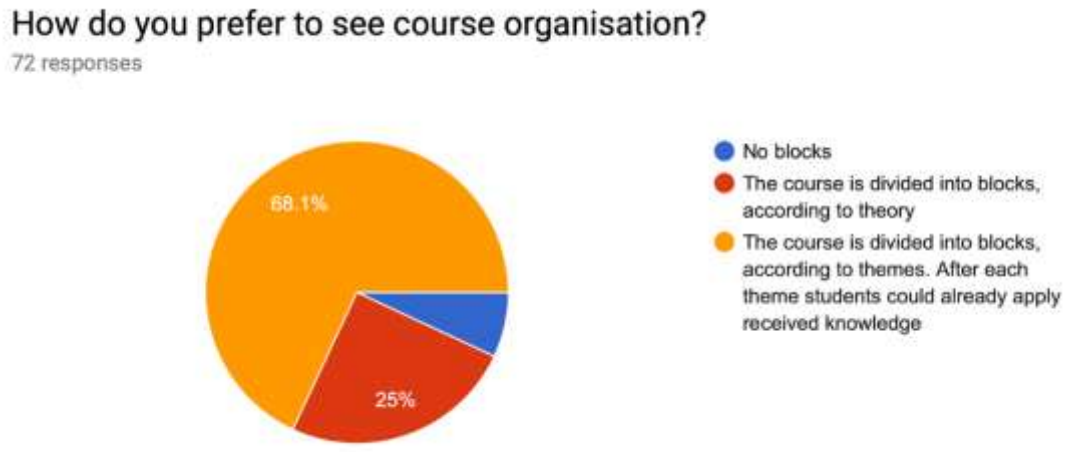


Figure 5 A Course organisation

According to Figure 6, most of the respondents (66.7%) do not use specific applications. However, the insights from the third part of the survey show that the most common techniques for memorising are revising from personal notes.

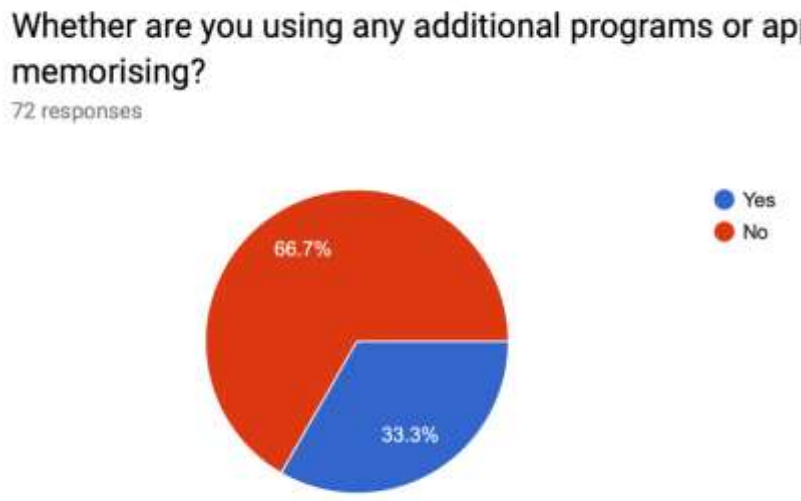


Figure 6 Usage of additional applications for memorising

## 5.2 Survey analysis and key findings

Table 1 below presents a cross tabulation based on the respondents' occupational background. Thus, all the respondents were grouped according to those who (a) study, (b) work, (c) study and work, or are (d) unemployed. The cross tabulation was done by using IBM's SPSS Statistics.

Table 1 Respondents who recently participated in online courses grouped by occupation

| | | | No | Yes | Total |
|---|---|---|---|---|---|
| Occupation | Study | Count | 18 | 28 | 46 |
| | | % within Occupation | 39.1% | 60.9% | 100.0% |
| | Study and Work | Count | 6 | 10 | 16 |
| | | % within Occupation | 37.5% | 62.5% | 100.0% |
| | Unepmloyed | Count | 0 | 15 | 15 |
| | | % within Occupation | 0.0% | 100.0% | 100.0% |
| | Work | Count | 4 | 19 | 23 |
| | | % within Occupation | 17.4% | 82.6% | 100.0% |
| Total | | Count | 28 | 72 | 100 |
| | | % within Occupation | 28.0% | 72.0% | 100.0% |

Based on the responses, the respondents who studied were in fact attending fewer online courses than those who were at work or unemployed. Of those who study (46

respondents) or study and work (16 respondents), 60.9% and 62.5% had recently participated in online courses. Of the respondents who work (23 respondents) or are unemployed (15 respondents), 82.6% and 100% had participated in online courses (Table 1). One possible explanation could be that full-time students focus on their current studies and have little time to spend for additional courses.

Table 2 Gender grouped by occupation

| | | | Gender | | | |
|---|---|---|---|---|---|---|
| | | | Female | Male | Prefer not to say | Total |
| Occupation | Study | Count | 20 | 26 | 0 | 46 |
| | | % within Occupation | 43.5% | 56.5% | 0.0% | 100.0% |
| | Studu and Work | Count | 7 | 8 | 1 | 16 |
| | | % within Occupation | 43.8% | 50.0% | 6.3% | 100.0% |
| | Unemployed | Count | 12 | 3 | 0 | 15 |
| | | % within Occupation | 80.0% | 20.0% | 0.0% | 100.0% |
| | Work | Count | 16 | 7 | 0 | 23 |
| | | % within Occupation | 69.6% | 30.4% | 0.0% | 100.0% |
| Total | | Count | 55 | 44 | 1 | 100 |
| | | % within Occupation | 55.0% | 44.0% | 1.0% | 100.0% |

As Table 2 shows, more women than men participated in the survey. For the table, the primary occupation was taken into the account. For example, if a respondent answered that the occupation is “student” and “unemployed”, we count the respondent as a student. Among employed and unemployed respondents relatively more women answered.

Table 3 Amount of time spent for a course studying in a week grouped by occupation

| | | | 2-4 hours | 4-6 hours | Less than 2 hours | More than 6 hours | Total |
|---|---|---|---|---|---|---|---|
| Occupation | Study | Count | 12 | 6 | 6 | 4 | 28 |
| | | % within Occupation | 42.9% | 21.4% | 21.4% | 14.3% | 100% |
| | Studu and Work | Count | 2 | 2 | 1 | 5 | 10 |
| | | % within Occupation | 20.0% | 20.0% | 10.0% | 50.0% | 100.0% |
| | Unemployed | Count | 7 | 3 | 2 | 3 | 15 |
| | | % within Occupation | 46.7% | 20.0% | 13.3% | 20.0% | 100.0% |
| | Work | Count | 8 | 2 | 5 | 4 | 19 |
| | | % within Occupation | 42.1% | 10.5% | 26.3% | 21.1% | 100.0% |
| Total | | Count | 29 | 13 | 14 | 16 | 72 |
| | | % within Occupation | 40.3% | 18.1% | 19.4% | 22.2% | 100.0% |

Starting from this question, the total number of respondents is 72. Table 3 shows that around 40% of these respondents across the different occupation groups spent from two to four hours weekly for online courses. 50% of the respondents who combine study and work spent more than six hours per week. The possible answer could be that online courses are a part of their study program

Table 4 A preferred course organisation group by occupation

| | | | No blocks | The course is divided into blocks according to themes. After each theme students could already apply received knowledge | The course is divided into blocks according to theory | Total |
|---|---|---|---|---|---|---|
| Occupation | Study | Count | 4 | 17 | 7 | 28 |
| | | % within Occupation | 14.3% | 60.7% | 25.0% | 100% |
| | Studu and Work | Count | 0 | 3 | 7 | 10 |
| | | % within Occupation | 0.0% | 30.0% | 70.0% | 100.0% |
| | Unemployed | Count | 0 | 13 | 2 | 15 |
| | | % within Occupation | 0.0% | 86.7% | 13.3% | 100.0% |
| | Work | Count | 1 | 16 | 2 | 19 |
| | | % within Occupation | 5.3% | 84.2% | 10.5% | 100.0% |
| Total | | Count | 5 | 49 | 18 | 72 |
| | | % within Occupation | 6.9% | 68.1% | 25.0% | 100.0% |

Table 4 reveals that most respondents prefer that an online course is somehow divided into themed blocks so that students can easily apply the received knowledge after each lesson. For example, if the block is “How to make an order in cafe”, students will know and can use received knowledge after the lesson.

It is possible to conclude that the materials should be oriented for people who do not have much free time. Thus, the structure of a course should be clear and simple. The materials should contain all the required information for understanding the topic so that users do not waste time in looking for extra materials and additional sources.

Table 5 Types of materials at the course

| | | | Theory in video form | Theory in text form | Presentation(s) | Home aasignments | Group discussion / social media channels | References to additional information |
|---|---|---|---|---|---|---|---|---|
| Occupation | Study | Count | 21 | 20 | 11 | 15 | 8 | 11 |
| | | % within Occupation | 18.92% | 18.02% | 9.91% | 13.51% | 7.21% | 9.91% |
| | Work | Count | 19 | 17 | 9 | 10 | 11 | 10 |
| | | % within Occupation | 19.00% | 17.00% | 9.00% | 10.00% | 11.00% | 10.00% |
| | Unemployed | Count | 5 | 7 | 7 | 10 | 5 | 3 |
| | | % within Occupation | 11.90% | 16.67% | 16.67% | 23.81% | 11.90% | 7.14% |
| | Study and Work | Count | 13 | 12 | 3 | 8 | 12 | 2 |
| | | % within Occupation | 22.03% | 20.34% | 5.08% | 13.56% | 20.34% | 3.39% |
| Total | | Count | 58 | 56 | 30 | 43 | 36 | 26 |
| | | % within Occupation | 18.59% | 17.95% | 9.62% | 13.78% | 11.54% | 8.33% |

| | | | Meetings with teacher(s) | Self-check home assignment | Mentor's help | Webinars with teacher | Other | Total |
|---|---|---|---|---|---|---|---|---|
| Occupation | Study | Count | 6 | 8 | 6 | 5 | 2 | 111 |
| | | % within Occupation | 3.60% | 7.21% | 5.41% | 4.50% | 1.80% | 100.00% |
| | Work | Count | 0 | 9 | 8 | 5 | 2 | 100 |
| | | % within Occupation | 0.00% | 9.00% | 8.00% | 5.00% | 2.00% | 100.00% |
| | Unemployed | Count | 2 | 1 | 1 | 1 | 0 | 42 |
| | | % within Occupation | 4.76% | 2.38% | 2.38% | 2.38% | 0.00% | 100.00% |
| | Study and Work | Count | 0 | 2 | 3 | 4 | 0 | 59 |
| | | % within Occupation | 0.00% | 3.39% | 5.08% | 6.78% | 0.00% | 100.00% |
| Total | | Count | 6 | 20 | 18 | 15 | 4 | 312 |
| | | % within Occupation | 1.92% | 6.41% | 5.77% | 4.81% | 1.28% | 100.00% |

As Table 5 shows, the most preferred materials among students are theory in video form (18.92%), theory in text form (18.02%), and home assignments (13.51%). Respondents who work prefer to interact with video (19.00%) and text (17.00%) and have access to group discussions or social media channels (11%).

Those respondents who study and work mark that courses should have home assignments (23.81%), theory in text form and presentation(s) (16.67%), and theory in video form and access to group discussions (11.90%). Unemployed respondents mark theory in video form (22.03%), and theory in text form and group discussions (20.34%) and home assignments (13.56%). It is notable that webinars and meetings with a teacher are not considered very important.

Answers related to the question about additional materials were cleaned and all irrelevant answers (e.g. “I have all the needed materials”, “nothing”) were deleted. Voyant Tools was used to analyse the text to find frequency and collocations. Based on the received results (Appendix 5, see section 5.1), five main topics were identified: mentorship, course guidelines, materials, practice, and content representation. The most common problem related to mentorship is a long duration of the response time. Lack of clear guidance about course structure and assignments, willingness to receive the information about order and what to study was pointed out as another issue. Moreover, respondents noted that they would like to have links to the official academic resources (in addition to useful material) to be able to return or revise after the end of the course. Visual representation of the content, more images and videos or presentations on the topic were defined as being critical.

According to the received results, the lesson page should include theory in video form, theory in text form to study the theory afterwards, and resources with home assignments and links to additional resources to discover more about grammar or work on vocabulary. An online language learning course page should contain detailed information about course structure and how to work during the course as well as links to social media channels and group discussions.

Table 6 The additional application usage group by occupation

| | | | No | Yes | Total |
|---|---|---|---|---|---|
| Occupation | Study | Count | 17 | 11 | 28 |
| | | % within Occupation | 60.7% | 39.3% | 100% |
| | Studu and Work | Count | 5 | 5 | 10 |
| | | % within Occupation | 50.0% | 50.0% | 100.0% |
| | Unemployed | Count | 12 | 3 | 15 |
| | | % within Occupation | 80.0% | 20.0% | 100.0% |
| | Work | Count | 14 | 5 | 19 |
| | | % within Occupation | 73.7% | 26.3% | 100.0% |
| Total | | Count | 48 | 24 | 72 |
| | | % within Occupation | 66.7% | 33.3% | 100.0% |

According to Table 6, of the respondents who study, 39.3% use additional applications. Of the respondents who study and work, 50% use additional applications. The percentages are lower among the respondents who are employed (20%) or unemployed (26.3%).

Based on the frequency of the usage of the words received from Voyant Tools (Appendix 5, see section 5.2) the word “Apple” (3) and the word “Google” (2) appeared three and two times respectively. This shows that the respondents use the companies’ products. At the same time, the most common application is Quizlet (4). Duolingo’s products appeared two times: Tiny cards (1) and Duolingo (1). NeuroNation, WordDive, Memrise, Forvo, and Totoeba are each mentioned once (1) by different respondents. It should be noted that NeuroNation focuses on scientific brain training, while Memrise, Fordo, Tatoeba and Quizlet help learn vocabulary. However, only Fordo, Tatoeba and Quizlet include the Finnish language. Thus the following platforms should be considered to be used as additional sources on the Neuro Lingua website. Quizlet, as it is the most popular, could be used to provide vocabulary sets, while Forvo and Tatoeba provide additional resources. WordDive and Duolingo are discussed in the next chapter to define existing solutions for content organisation.

## 5.3 Benchmarking

Based on the survey results, we chose three companies – Language tool, LinguaLift, Duolingo – that provide online language courses in order to compare the interface and course structures. However, none of the companies have the Finnish language as an option to learn. Thus, we added companies that provide Finnish language courses: WordDive and FinnishPod101.

The criteria to compare are visual appearance, navigation, guidelines explaining how to use the platform, lesson structure and types of materials used. The analysis is made

based on an attempt to pass one trial lesson. For every website, we created a new user account but did not pay for the full version.

Language Tools  https://languagetools.io)

An interface of the platform is clear and simple and contains three primary colours. Navigation is presented as a top menu with tabs. The idea of the platform is to connect teachers with students. The available sections are “Essays” (writing) and “Reading”. However, both listening and speaking, and grammar sections are missing. The platform is based on synchronous learning: the teacher and student communicate in real time. However, in the thesis the observations are focused on only available pre-prepared materials, we have not tried to have a face-to-face lesson.

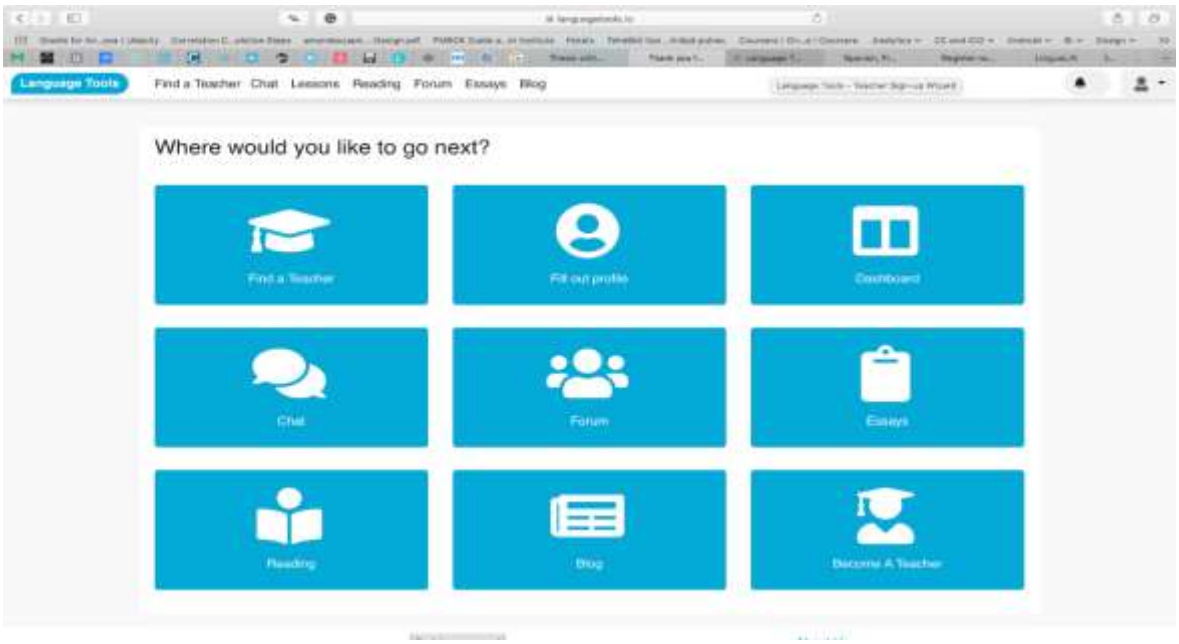


Image 3 The interface on the Language tool platform

The “reading” and “essays” sections are organised as a discussion forum with many topics. The single discussion is either a vocabulary set made by a teacher or a student’s essay with corrections and fellow students’ comments. Only the reading sections includes interactive elements. It shows with colours how many unknown words remain and how many are learned. The platform does not include onboarding or usage tutorial.

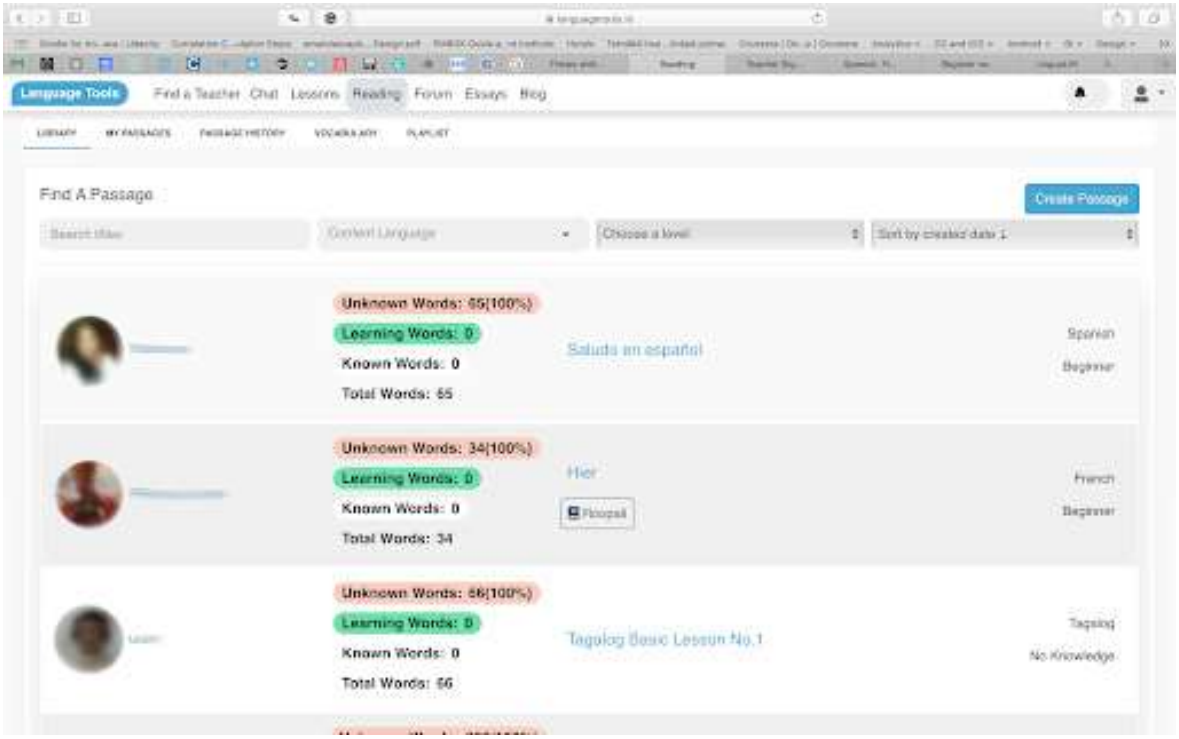


Image 4 The reading part on the Language tool platform

General information, additional resources and lectures are available in the forum. The biggest issue is that the forum topics are very general without division without being categorized according to a certain language (e.g. English, German, French etc).

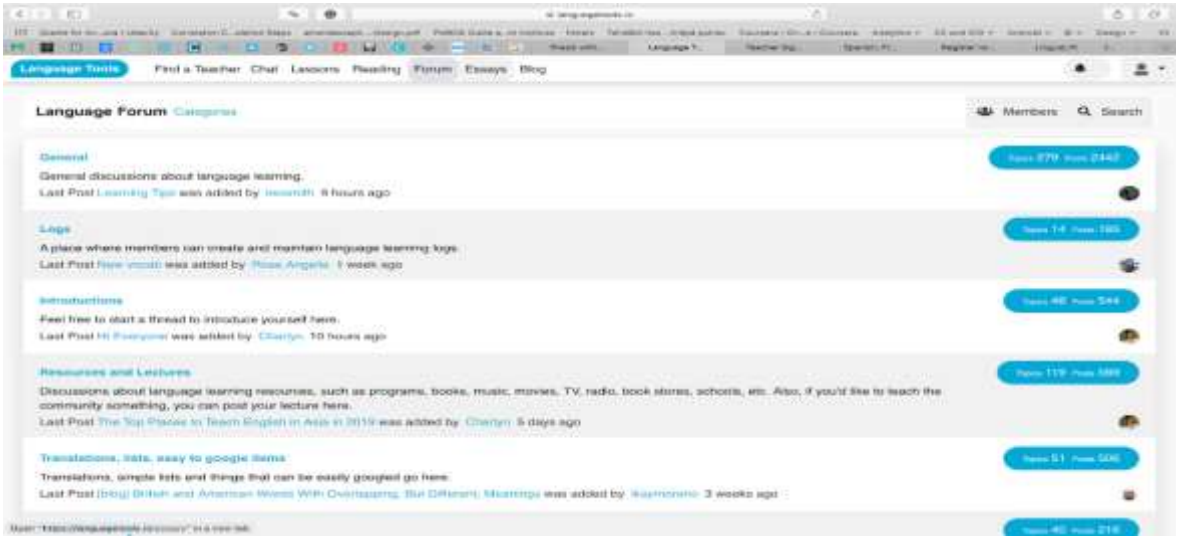


Image 5 The discussion forum on the Language tool platform

To sum up, the most significant feature the Language Tools platform provides is communication with teachers and sharing personal experiences. A clear and plain, intuitively understandable interface with good navigation is a plus. Poor structure of the forum topics and absence of the provided materials in any other forms except text are minuses.

LinguaLift (https://www.lingualift.com)

The visual appearance of a platform is clear and creative with many graphical elements. Interaction includes colour highlights, progress bars and “Mark as done” buttons to go further on a course. Navigation is not simple, as some elements break the standard user experience (UX) model. For instance, the globe icon used to represent a website language change, not the list of courses. Tutors’ support is available in the full version, while the trial version offers a chat option. The list of courses is grouped by language learning levels: beginner level, intermediate level, advanced level. Each level represents a path from a first lesson. However, no onboarding tutorial or guidance on how to use the materials is provided.

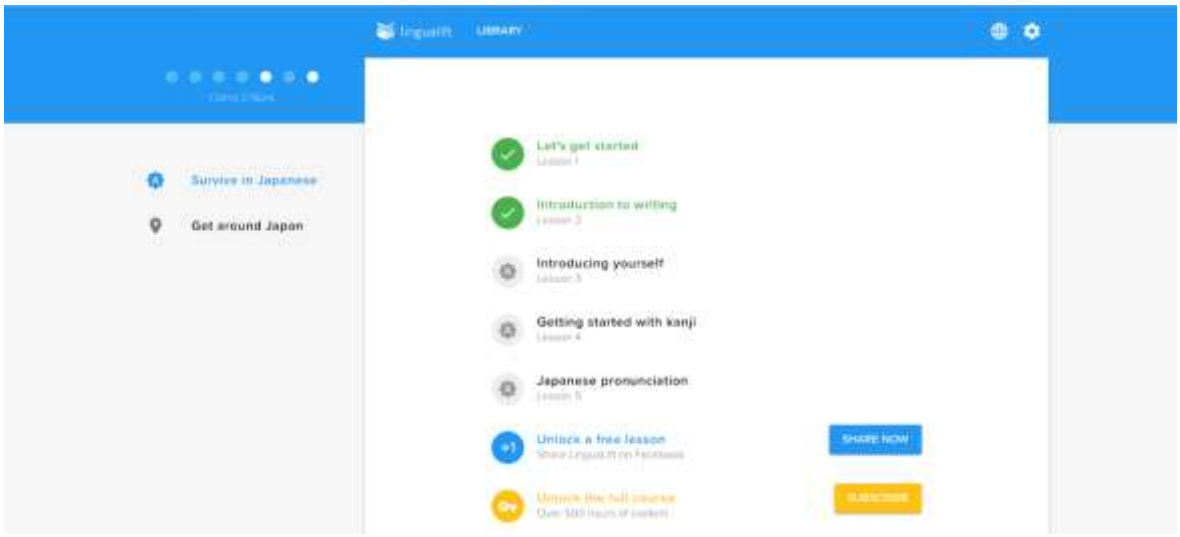


Image 6 Course structure on the LinguaLift platform

As Image 7 shows, a lesson page is divided into six blocks:

- The “Review skills” block aims to repeat the learned lesson, both theory and vocabulary. It includes multiple choice questions and audio support. The block provides hints and explanations if an answer is incorrect.
- The “Primer” block provides theory in a text form with visual illustrations and key terms with translations and audio. The first lesson explains the challenges and how to find motivation. At the end of the block, there is a small assignment that does not have any answers or automated checker.

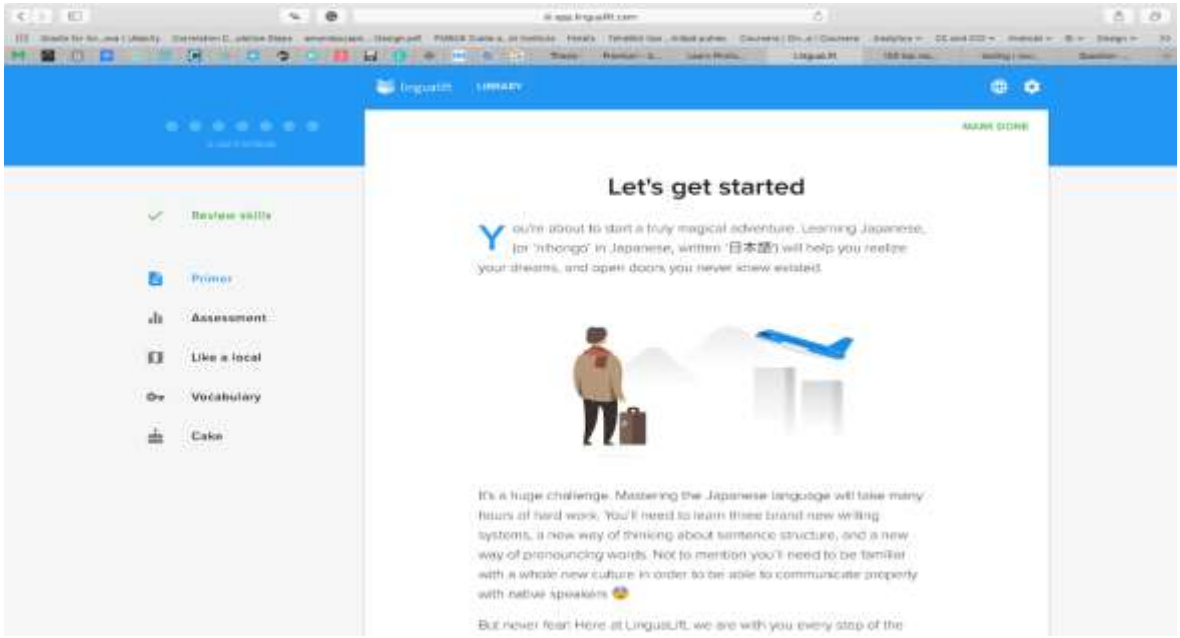


Image 7 The Primer block on the LinguaLift platform

- The “Assessment” block includes assignments based on the theory and vocabulary provided in the previous chapter and is similar to the “Review skills” block.

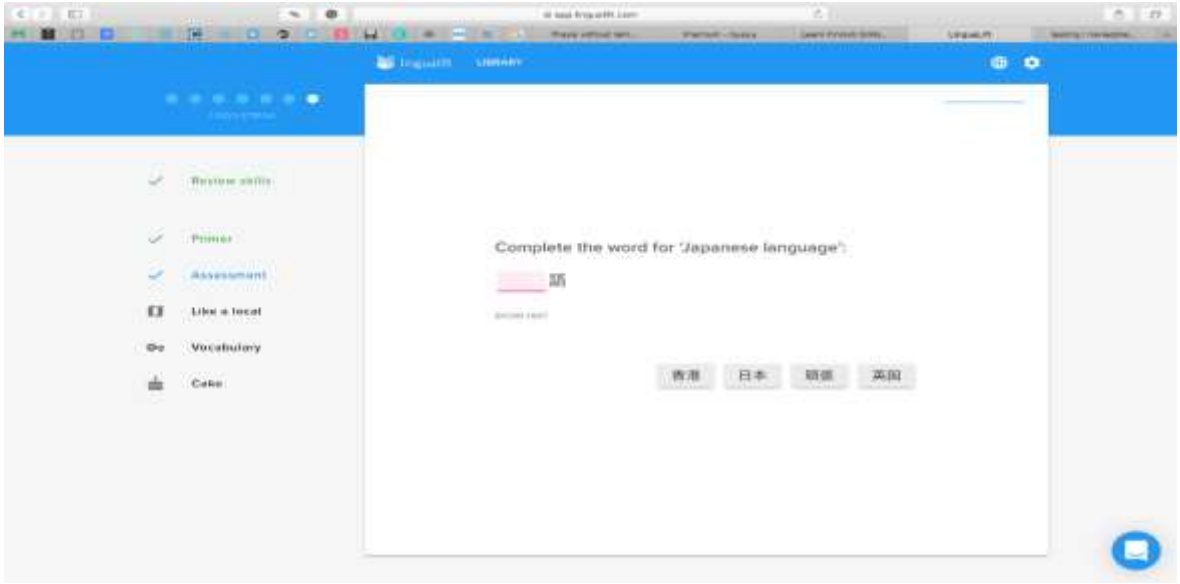


Image 8 The Assessment block on the LinguaLift platform

- The “Like a local” block provides some cultural insides. The block is important from linguistic studies perspective, as it provides some cultural aspects through the prism of language (Genc & Bada 2005, 80-81).


Image 9 The Like a local block on the LinguaLift platform

- The “Vocabulary” part provides a word list for a lesson to remember with audio pronunciations and translations.

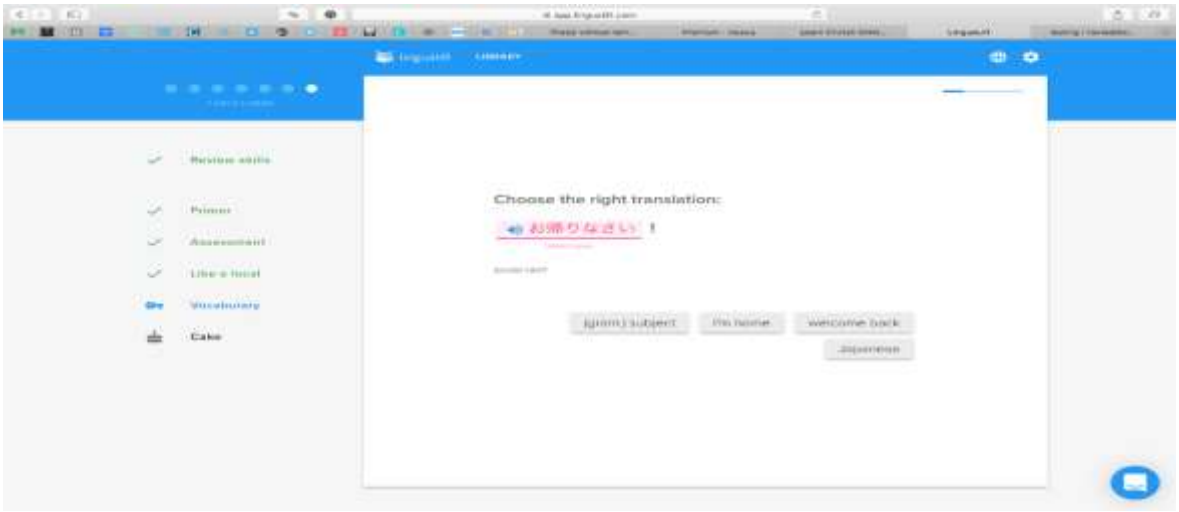


Image 10 The Vocabulary block on the LinguaLift platform

- The “Cake” part is for fun. It provides links to additional entertainment resources, such as Youtube videos.

In addition, the platform has a blog. It provides articles related to the available languages or the learning process and methodology. Useful resources are grouped and prioritised on the grounds of resource types.

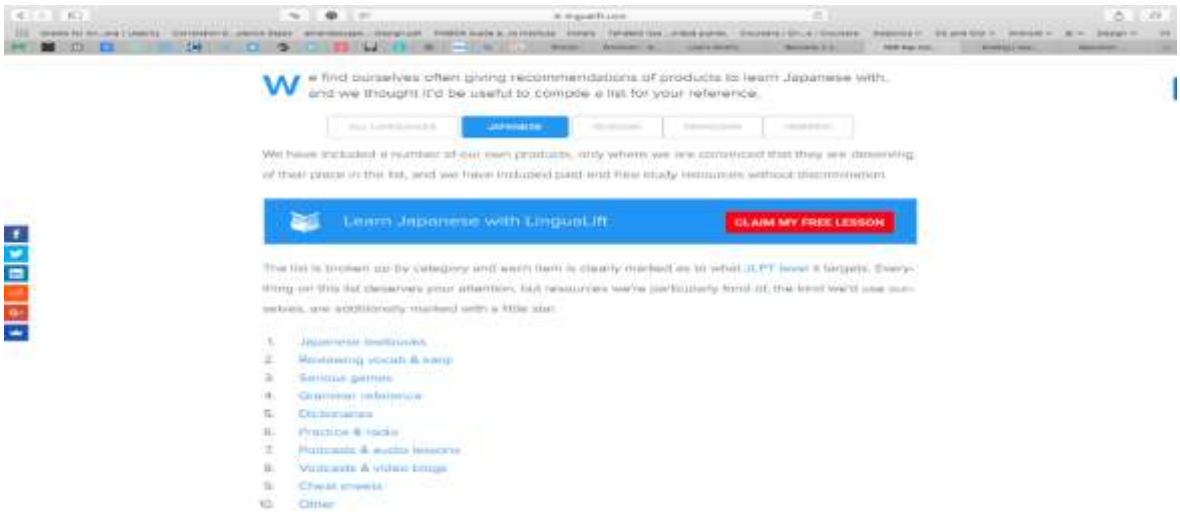


Image 11 The blog on the LinguaLift platform

To sum up, the LinguaLift platform has more functions than other evaluated platforms and fully meets the expectations our respondents expressed in our survey.

Duolingo (https://www.duolingo.com)

Duolingo is one of the biggest online platforms for language learning. Currently, the platform provides language courses in 28 different languages and has 99 courses. The visual appearance of the platform is creative with many graphical elements. Guidance during the first start simplifies the navigation on the website. Progress bars and bonus ‘lingots’, provided for successful level up, aim to increase engagement. Audio support and colour highlights make the learning process effective.

The courses mostly focus on memorising terms and phrases and repeating them. However, grammar is provided for every lesson on a text form. Language learning levels, for example beginner level, intermediate level, and advanced level, motivates to repeat and improve knowledge.

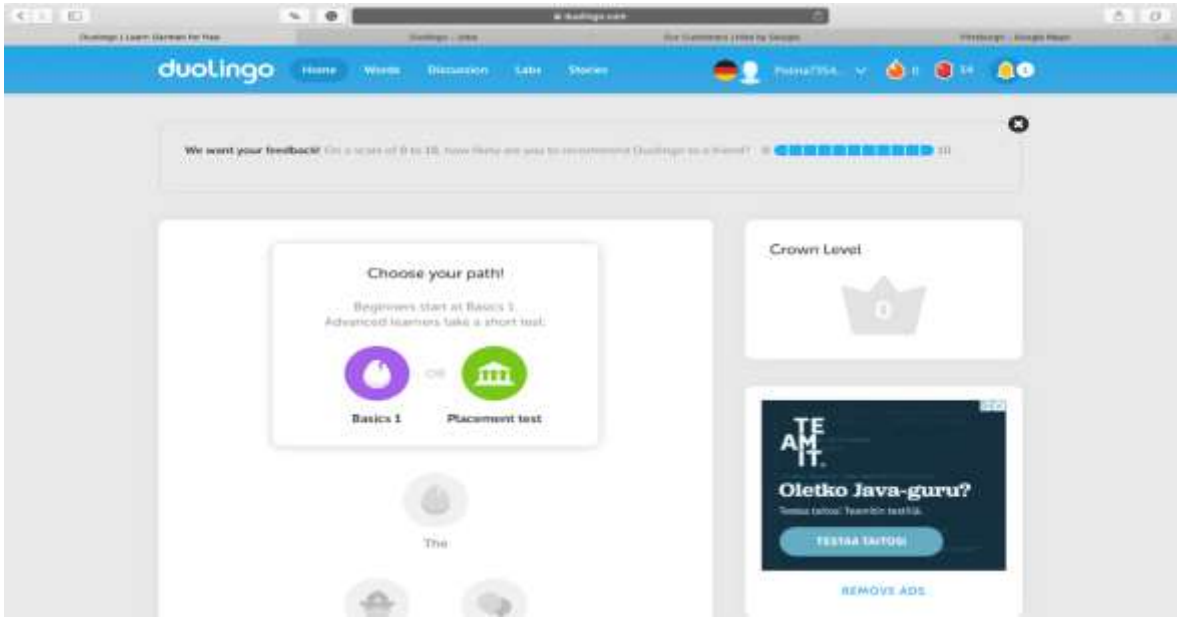


Image 12 Levels of complicity on the Duolingo platform

The platform provides discussion forums, where students ask questions and receive answers from more experienced teachers or peers. The discussion forums appear based on the user's ongoing language courses.

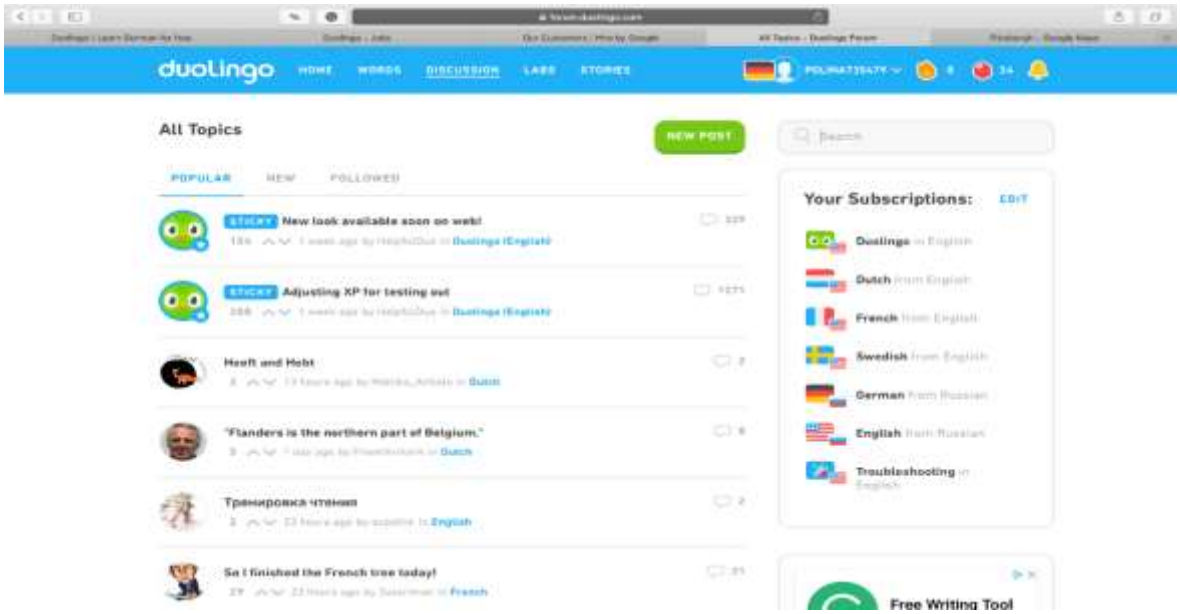


Image 13 A discussion forum on the Duolingo platform

Additional materials consist of stories to practice reading and comprehension skills, podcasts to improve listening skills, dictionaries to enrich vocabulary and events for live communication between users.

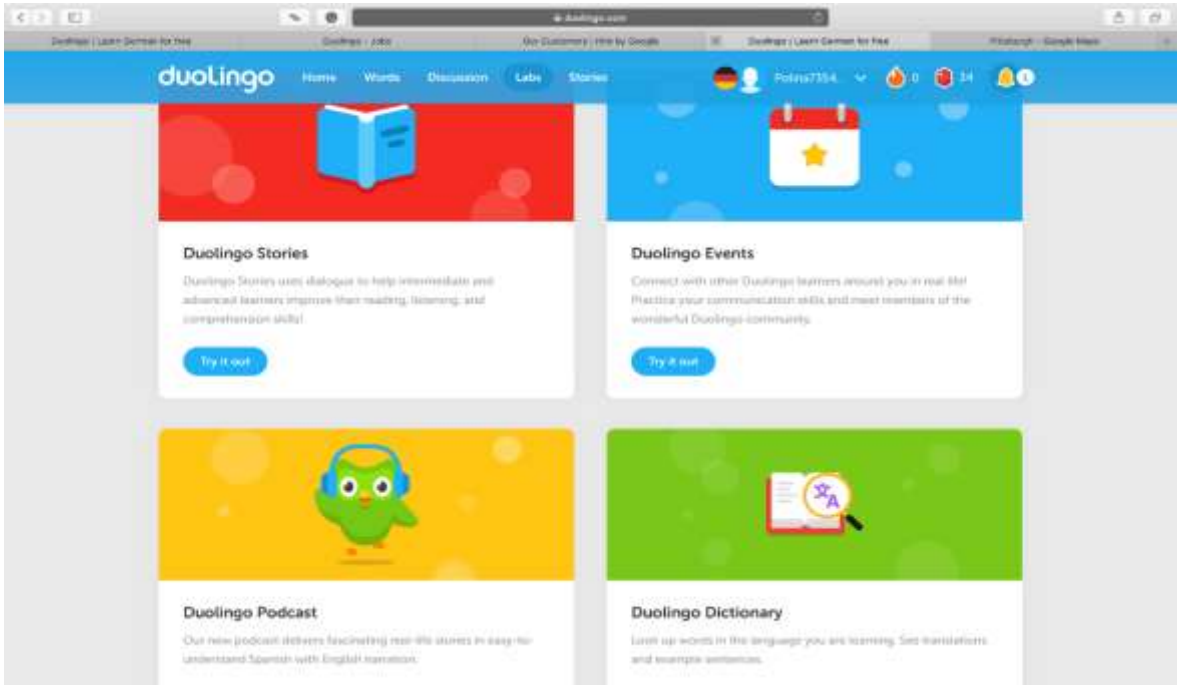


Image 14 Additional materials on the Duolingo platform

To summarise, Duolingo's functionality is great. A strong community is a big plus. The platform focuses on reading, listening and partly writing with a focus on grammar and vocabulary set. Regarding our survey results, mentorship as well as links to academic resources, are opportunities for further implementation.

FinnishPod 101 (https://www.finnishpod101.com)

The platform is developed by the Innovative Way company. It is one of the language learning platforms of the company. Even though the guidance acquaints users with the basic functionalities and sets a goal for the course, many implemented features (e.g. Add a pathway and Edit pathway) make navigation complex. The visual appearance is simple. However, the colour scheme is imbalanced. Usage of more than three-four main colours for interface elements and background – primary dark, first light, accent colour – dispels attention. (Babich 2016.)

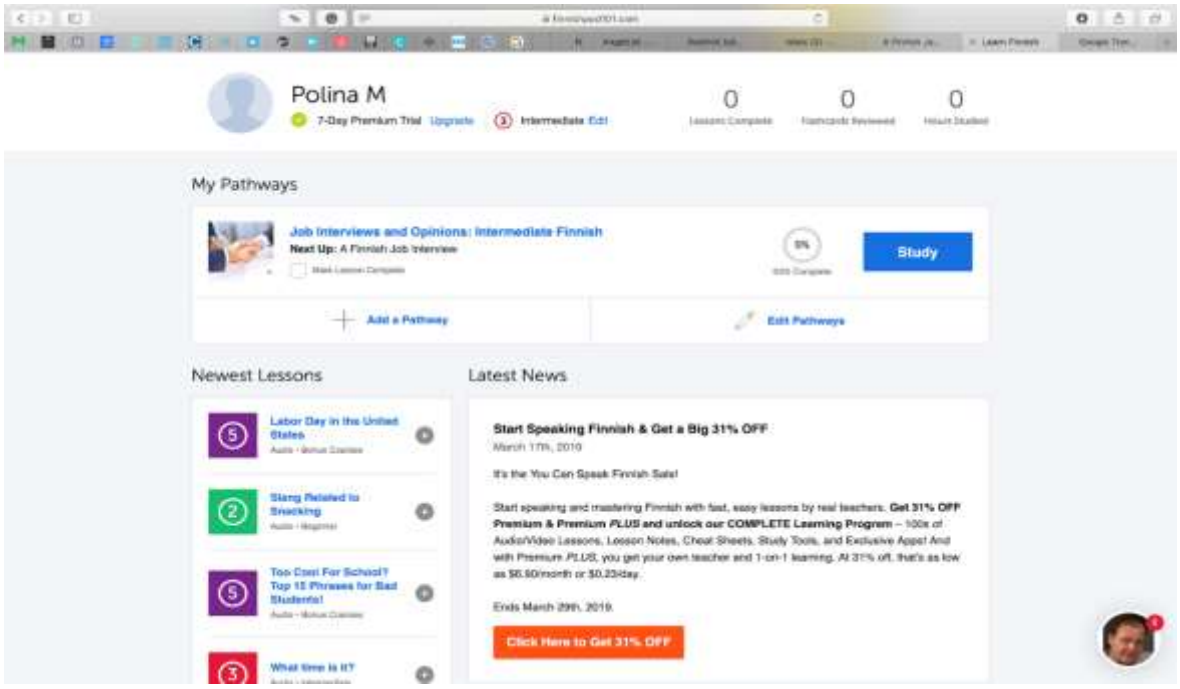


Image 15 The interface on the FinnishPod 101 platform

A path represents a course structure. Each lesson has a small description under the title and total time duration of the lesson.

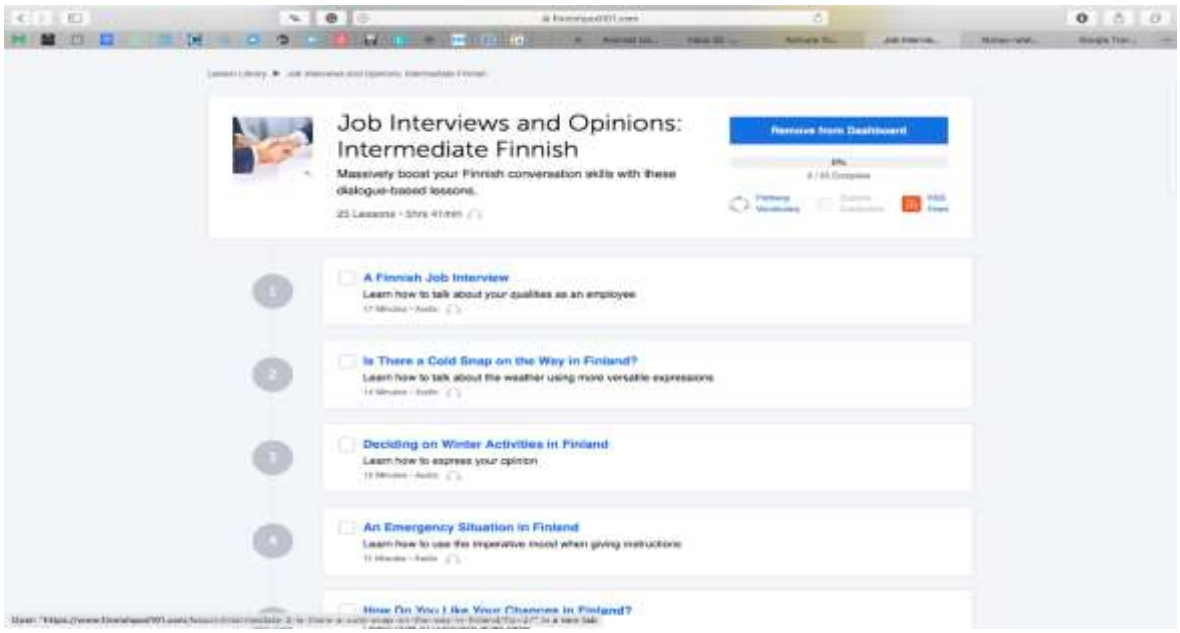


Image 16 A lesson page on the FinnishPod 101 platform

The lesson consists of five parts. The dialogue part includes a dialogue with audio and a script in the original language and its translation. The Vocabulary part provides words and examples of sentences using new words. The words can be listened to at the average speed of audio playback or slower. The Lesson notes part consists of theory in text format, and cultural reference and additional materials are in the PDF format. A lesson has

audio that contains all the above chapters with a small intro and additional explanations, and a script is provided in the lesson transcript part. The Comments part allows students to communicate with each other and course moderator.

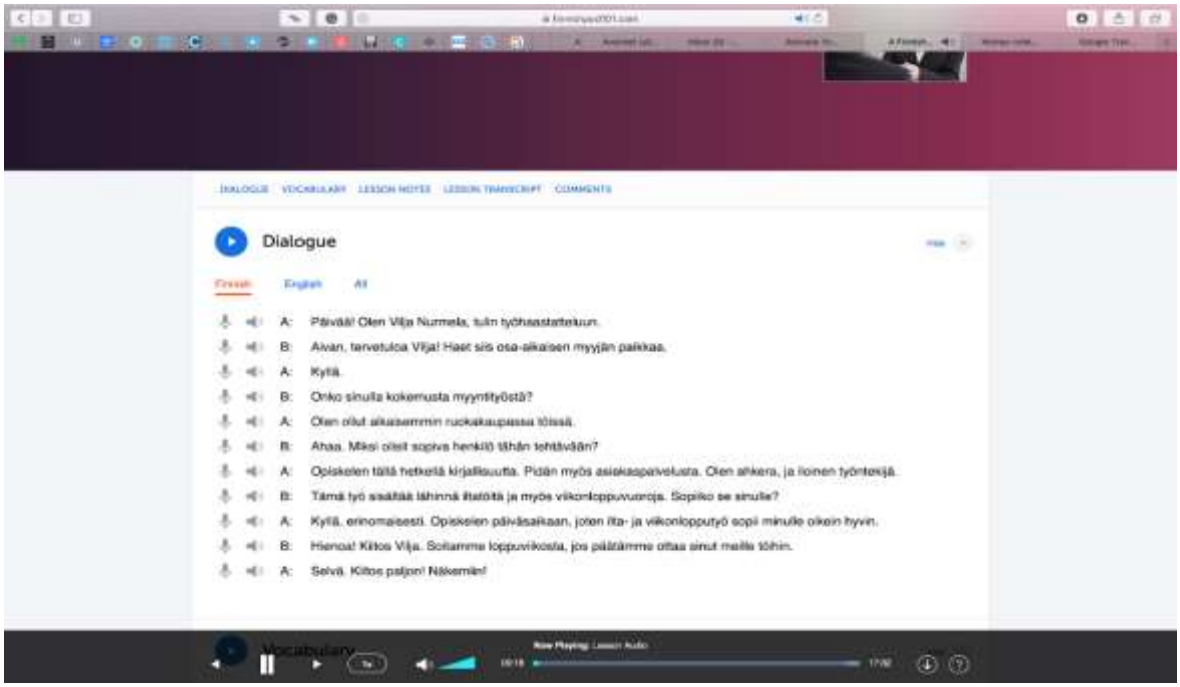


Image 17 The Dialogue part of a lesson on the FinnishPod 101 platform

In general, the platform has rich functionality. It could be compared with LinguaLift. Possible disadvantages are the lack of exercises to consolidate theoretical knowledge and complex navigation.

Word Dive (https://www.worddive.com/en/learn-finnish)

The platform’s visual appearance is creative and simple at the same time. The platform has onboarding to familiarise users with the features and opportunities of the platform. The onboarding process consist of choosing the language and setting a target goal to the course.

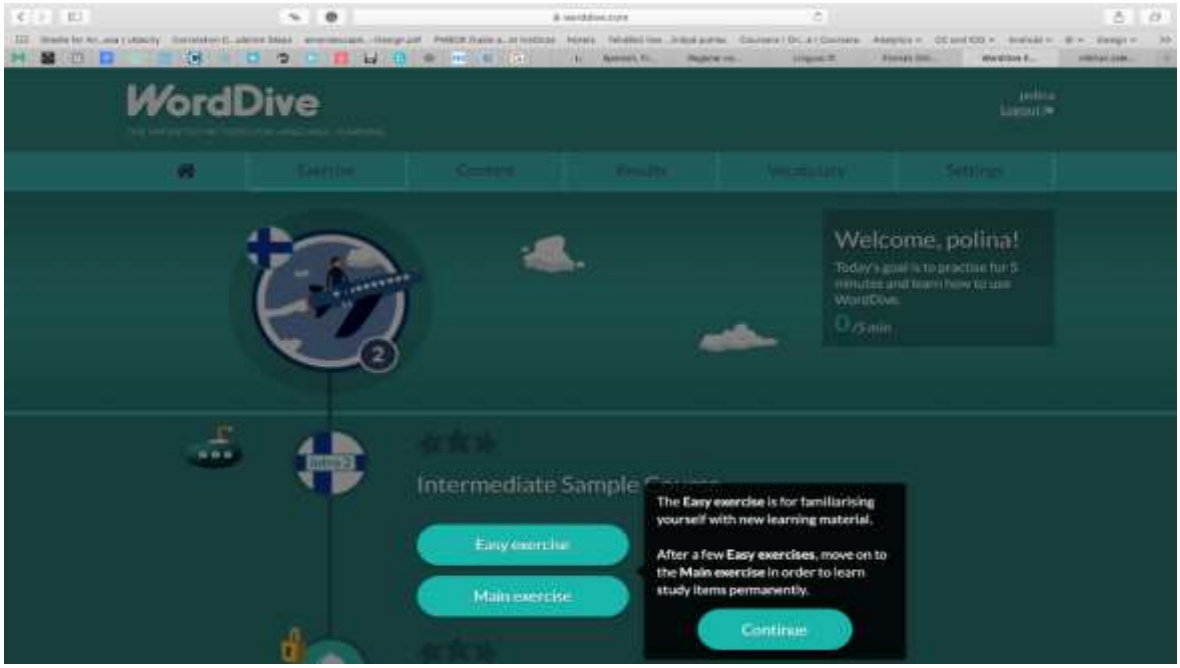


Image 18 The account on the Word Dive platform

As Image 18 shows, the Exercise tab provides the vocabulary training divided into sections, which is similar to Duolingo. However, the tasks are more sophisticated: two modes give the opportunity to start from the “easy exercise” cards training and to continue with the “main exercise” with synonyms and descriptions, accompanied by audio and sentence examples. Each training set has an interactive progress bar and a results board shown afterwards. All trained words and their definitions appear in the Vocabulary tab, with the learning quality based on the number of the repetitions.


Image 19 Learning vocabulary on the Word Dive platform

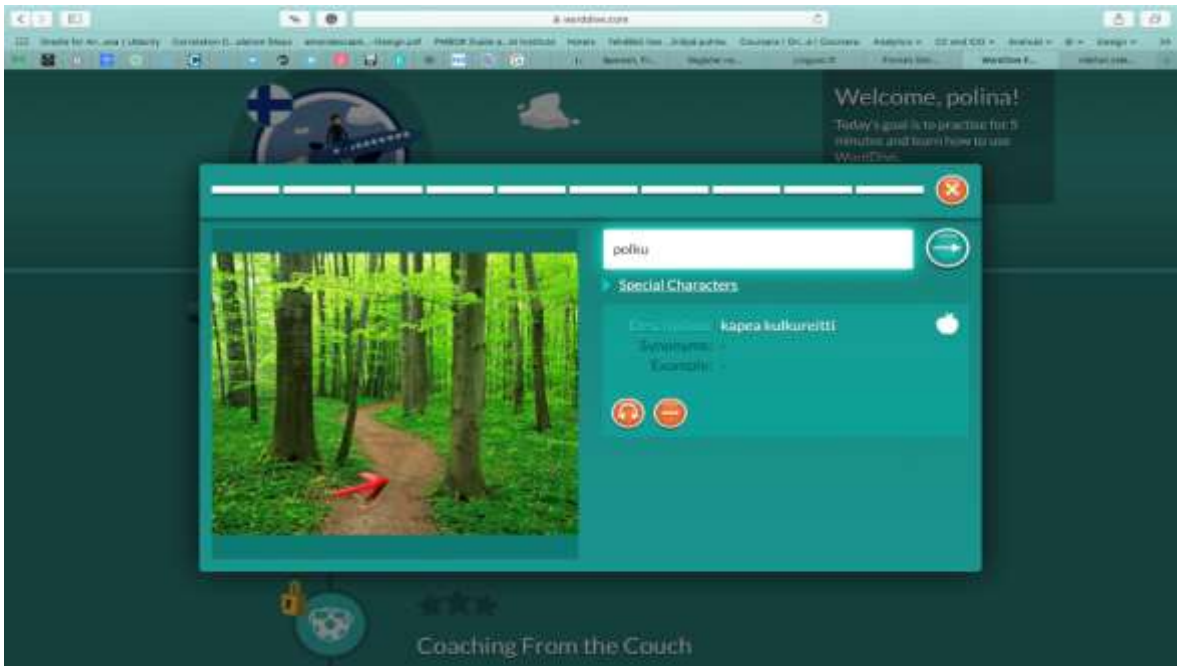


Image 20 Learning vocabulary on the Word Dive platform

The Content Tab contains the selected course(s), topics (e.g. Work and Study, Travel, Nature and Environment etc.) and the complexity level. Users can enable or disable the complexity level and topics. The Results tab provides learning progress statistics.

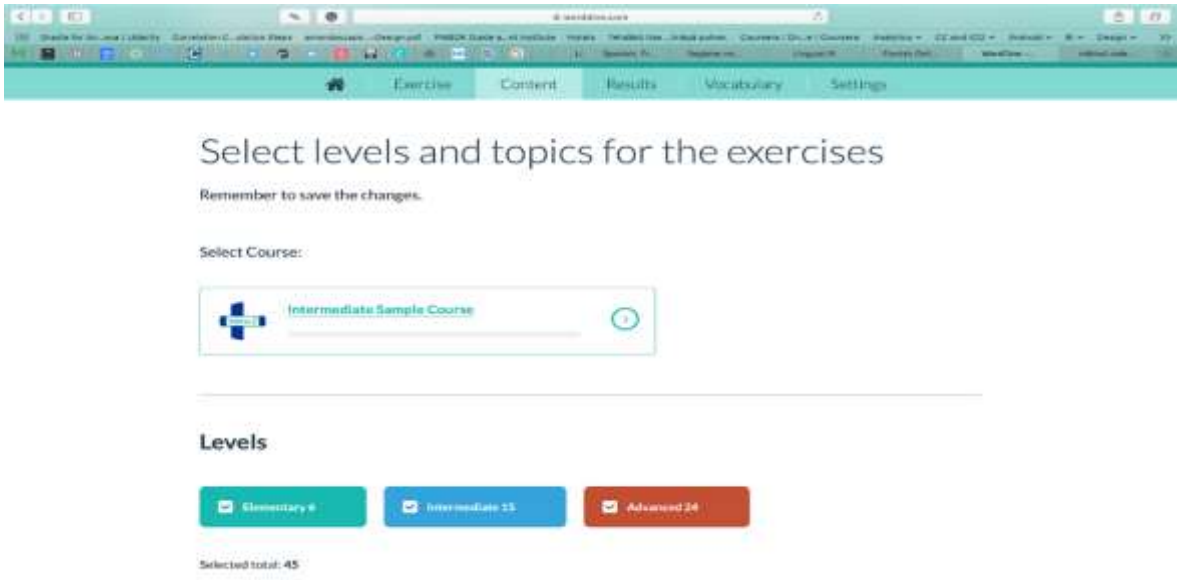


Image 21 Select levels and topics for the exercises on the Word Dive platform

There is a possibility to learn theory on the platform. However, grammar seems to be more like a subsidiary product, as the top menu does not provide access to it. In addition, a layout for the grammar section is more plain and without interactive elements. The theory part is structured based on the topic. Each lesson provides examples to support theory. However, no assignments or additional resources are available.

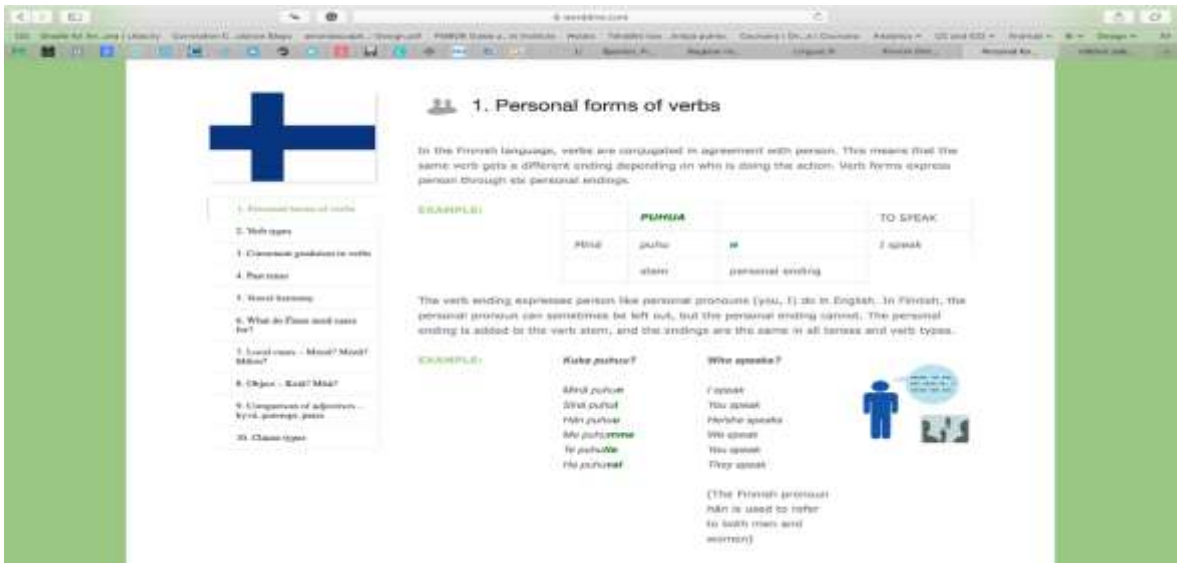


Image 22 Theory block on the Word Dive platform

All in all, the advantages of the platform are creativity and simplicity, clear navigation and guidance. The disadvantages are disjoint vocabulary and grammar parts and the absence of the reading part. Theory is provided only in text form, and lack of supplementary materials is notified.

## 5.4 Benchmarking analysis and key findings

The observations collected during the benchmarking and a Google Speed test and a WebAim contrast check were categorised into fifteen categories. The categories (Table 7) were grouped in two blocks: (1) functionality; (2) teaching and materials. The functionality block includes the following: interface, landing page colours, contrast rate based on WebAim results, main page load speed score based on Google Speed test, the responsiveness of the layout, navigation, onboarding and call-to-action availability, and interactivity. The teaching and materials block includes the following: learning methods, topics covered on a platform, provided materials, and available communication sources.

Table 7 Pivot table of Online learning platforms

| | | Languagetool | LinguaLift |
|---|---|---|---|
| **Functionality** | Interface | Clear and simple | Clear and creative, with many graphical elements |
| | Main page colours | Light-blue (#2196F3)<br>Light-grey (#F0F0F0)<br>White (#FFF)<br>Black (#000) | Blue (#2196F3)<br>Green (#4CAE50)<br>White (#FFF) |
| | Contrast rate (WebAim) | 2.73:1 – fail – white text and light blue background<br>18.42:1 – pass – black text and light-grey background | 3.21:1 – partly pass – white text and blue background<br>2.8:1 – fail – white text and orange background |
| | Load Speed (Google Speed) | 96/100 | 98/100 |
| | Responsiveness of the layout | Poor | Good |
| | Navigation | Poor on some parts of the website. Problems with the content grouping | Not simple, as some elements break the common UX model |
| | Onboarding or Usage tutorial | No | Yes |
| | CTA on main page | Yes | Yes |
| | Interactivity | Only in the reading section – shows with colours how many unknown words rest | Colours highlights, progress bars and “Mark as done” buttons to go further through a course |
| **Teaching and Materials** | Learning method | Synchronous | Asynchronous |
| | Aspects covered | Writing, Reading, Vocabulary | Reading, Grammar, Listening, Vocabulary |
| | Provided materials | In text format, group discussions, Home assignment, Links to additional sources | In video format, In text format, Mentors' help, Home assignments, Self-check assignments, Links to additional sources |
| | Communication | Forum, topics are general without division on the language ground | Tutors' support and general chat |
| | Additionsl notes | – | Provide some cultural insides block. |

Table 7 Pivot table for Duolingo, WordDive, and FinnishPod101 online learning platforms

| | | Duolingo | WordDive | FinnishPod101 |
|---|---|---|---|---|
| Functionality | Interface | Clear and creative, with many graphical elements | Clear and creative | Simple and disbalanced |
| | Main page colours | Dark-blue (#0B579C)<br>Light-green (#78C800)<br>White (#FFF) | Dark-green (#046D67) | Dark-blue (#0B529F)<br>Yellow (#FFE000) |

| | | | | |
|---|---|---|---|---|
| | | | orange (#D64526) white (#FFF) | White (#FFF) Black (#000) |
| | Contrast rate (WebAim) | 7.34:1 – pass – white text and dark blue background 2.08:1 – fail – black text and yellow background | 6.19:1 – partly pass – white text and dark green background 4.43:1 – partly pass – white text and orange background | 7.71:1 – pass – white text and dark blue background 15.91:1 – pass – black text and yellow background |
| | Load Speed (Google Speed) | 87/100 | 92/100 | 98/100 |
| | Responsiveness of the layout | Good | Poor | Not optimal |
| | Navigation | Simple | Simple | Poor |
| | Onboarding or Usage tutorial | Yes | Yes | Yes |
| | CTA on main page | Yes | Yes | Yes |
| | Interactivity | Colours highlights, progress bars and “Mark as done” buttons to go further through a course | Colours highlights, progress bars | Have not been defined |
| **Teaching and Materials** | Learning method | Asynchronous | Asynchronous | Asynchronous |
| | Aspects covered | Reading, Grammar, Listening, Vocabulary | Grammar, Listening, Vocabulary | Reading, Listening, Vocabulary |
| | Provided materials | In text format, Self-check assignments, Links to additional sources | In text format, Self-check assignments, Links to additional sources | In text format, Mentors' help, Links to additional sources |
| | Communication | Forums grouped by the language and level of knowledge | Have not been found | Comments on the bottom of the lesson page |
| | Additionsl notes | Great interactivity accross the platformat. Many visual elements. Provides links to real-life events to practice language. | Disjoint vocabulary and grammar parts. Lack of additional materials. Blog with cultural insides | – |

To sum up, language platforms should be well structured with a simple and clear interface. The colour scheme should be reasonably uniform and consist of three to four colours. The palette of most analysed language platforms contains blue and white, which have a good contrast ratio. The speed performance of the webpage, according to the Google Speed Test, is high, with the average speed across the observed online platforms being 94.2 out of 100. The layout responsiveness of most of the observed platforms, however, needs certain improvements.

Navigation should not break common UX standards; the used elements should be familiar to the users and using a search tool on the website should not take much time. A call-to-action (CTA) button simplifies the funnel from landing page to signing up on a platform. A tutorial or onboarding that helps determine objectives and offers relevant materials is a significant part of the functionality. There are interactive elements that allow tracking progress, and there are colours that emphasize the correctness of the answer.

The learning/teaching method is asynchronous on 80% of the websites, which means that the content is prepared beforehand. During the observation, we paid attention to four main aspects of the language learning process (reading, writing, listening, and speaking), mentioned in subchapter 4.2. Grammar and Vocabulary are separated on different pages on the evaluated websites. Thus, we consider to define them as additional aspects. Most of the observed websites have the following four aspects: Reading, Grammar, Listening, and Vocabulary. The offered courses are presented as a list with some descriptions of their content. Usually a single course is divided into steps and sometimes include a small description of the lessons.

The lessons are divided into several parts. Materials are provided in the text and video format. Assignments could be with or without an automatic check. Communication is possible via discussion forums, comments below a lesson page or chat. One platform provides mentors' help. Additional materials and discussion forums can be accessed either under a lesson page or directly from a course page.

In the scope of the work, we develop a minimum viable product (MVP), which is a Finnish language learning website with a limited functionality. For the first iteration, we do not implement interactive elements, onboarding and discussion forums. However, our website should have a high loading speed. Having a responsive layout is considered as a competitive advantage. The main page should include a CTA button and a description of the provided service. A course page should consist of a small description and one lesson. A lesson page should be divided into six parts: theory, homework, materials, vocabulary, culture and feedback.

## 5.5 Interactive prototype creation

The process of creating the website includes the following steps: drawing a design, creating a layout, programming, and testing. As this thesis relies on one fully prepared Finnish lesson, the structure of the website includes the main page, a course page and a lesson page. The lesson page consists of a video with subtitles in two languages: English and

Finnish. In addition, the page includes theoretical material, vocabulary, a cultural overview, a set of assignments and links to additional materials.

The design of the website was created in Adobe Photoshop. The main page includes a logotype, a brand name, a slogan, advantages (tangible feature) and a short description of the website. Also, the page has photos and information about course supervisors to improve credibility, four icons of advantages and a call-to-action button.

Inkscape editor was used to draw the website's icons. This editor allows creating Scalable Vector Graphics (SVG), whose size is smaller compared to JPG and PNG images. Besides, SVG icons are scalable without artefacts. Each icon on the main page describes an advantage to motivate potential users to use the website. The colour of the icons is yellow.

Yellow, as well as black and white, were chosen as a color scheme of the website. Black (#000000) and white (#FFFFFF) colours are for the background of information blocks and text. The yellow (#FFC106) colour is for buttons and icons.

The text of the call-to-action button is capitalised. The button is large with a recommended button size of Material Design Framework with height 54px. A button's contrast ratio is a pass (12.88:1), based on the WebAim check. Goward (2013,194) points out that the right places for call-to-action buttons are the top of the page or the bottom of the content. In the prototype, the button is placed at the bottom of the page. The button lets users to take prompt action and go to a free lesson page.


Image 23 The main page of the prototype

The lesson page includes a video with an animation and a set of navigation tabs. Each tab has an individual icon which reflects the essence of its content. These icons are typical of different applications, and users are likely to be familiar with them. On mobile devices, a user does not see the tab titles. Only the icons are visible. The user can guess their functions/content intuitively. The following lists the tabs:

1. The Theory tab contains theory related to the topic of the lesson.

2. The Homework includes downloadable materials of the studied topic.
3. The Materials tab has links to additional documents, resources and academic studies, which are relevant to the lesson.
4. The Vocabulary tab includes a table of Finnish words and their translation.
5. The Culture tab provides information about the Finnish culture.
6. The Ask a teacher tab allows asking questions or sharing feedback on the lesson.

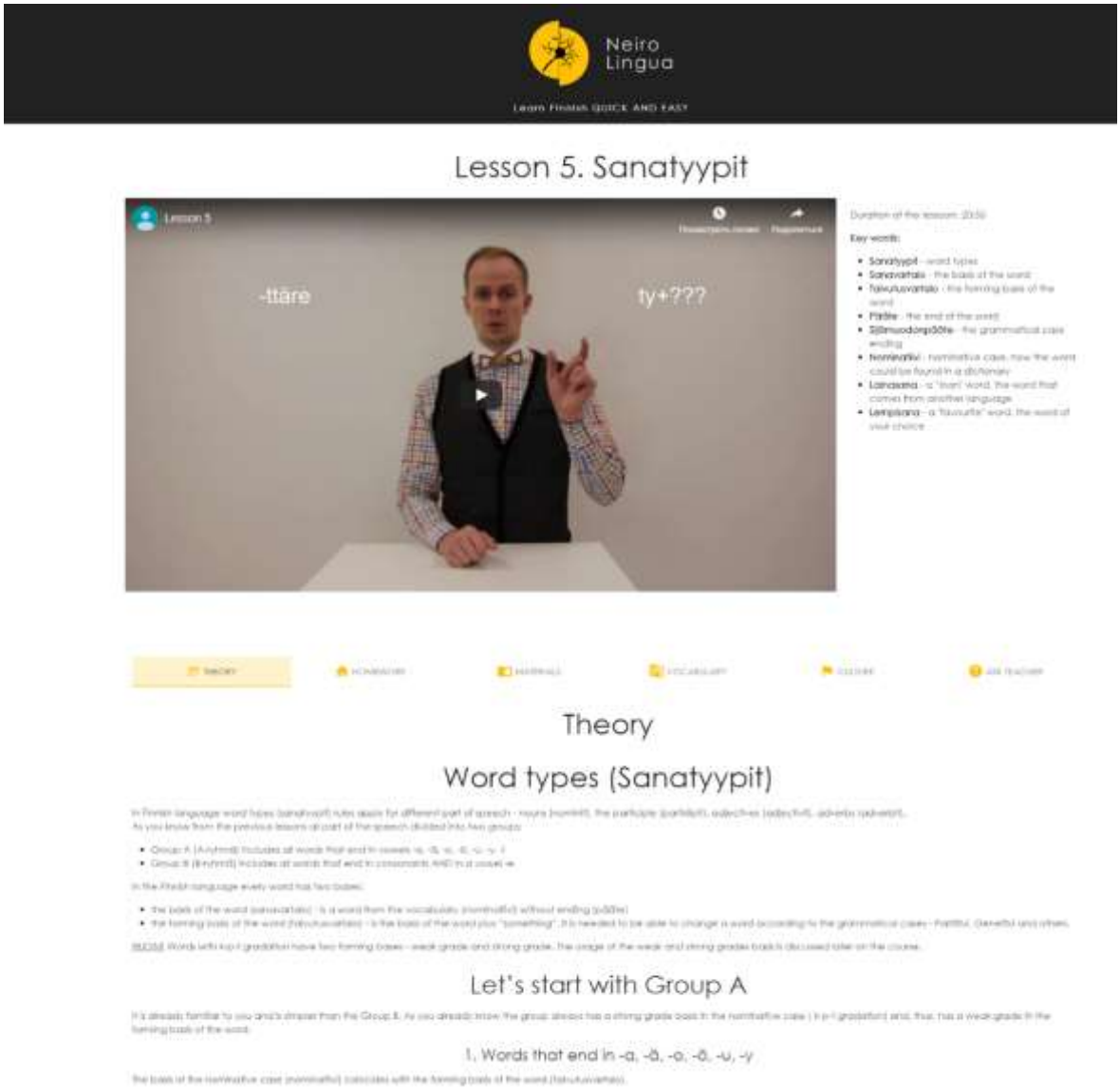


Image 24 The lesson page of the website

The layout and programming are done on MODx Revolution, a free content management system (CMS) (https://modx.com) with a big community around the world. The CMS is a universal system that allows creating projects with a different level of complexity from small landing pages to extensive e-commerce projects. The flexible structure of the CMS

allows realising any functionality on websites. MODx Revolution uses the PHP programming language and Mysql database that are typical for most Content Management Systems such as Wordpress, Drupal and Joomla.

MODx Revolution has fewer vulnerabilities than Wordpress and Joomla and other more popular CMSs. According to the Hacked Website Report (2018, 4), the most number of infected websites are created on Wordpress (90%), Joomla (4.3%) and Drupal (3.7%) while only 0.9% MODx websites were hacked in the same period.

MODx Revolution allows creating an original layout or use frameworks. The HTML and CSS layout of the website is executed on the Material Design framework, the design language created by Google. This framework includes basic settings for font style and size, forms' fields and other visual elements. Many services use the framework, for instance, YouTube, Google Drive, Google Play, and Hangouts as well as operating systems such as Android Nougat and Android Oreo.

The prototype website has a responsive layout, so it works on devices with different screen sizes. Besides, the main pages have a high download speed, which is 97/100 points on desktop computers and 99/100 points on mobile devices by Google PageSpeed Insights test.

## 5.6 Prototype usability test

The prototype usability test was conducted at different places due to the diversity of the respondents and their availability to participate in the test. In general, the link to the prototype was sent a few days before a meeting to give the participants the ability to get familiar with the website.

It is important to note that the test at Lahti University of Applied Sciences was not as successful as expected. This was because of the inability to break the ice at the beginning of the test. However, the discussion afterwards helped to get some insights. An opposite situation occurred with the other participants as they were exceptionally open and ready to share both positive and negative opinions.

It is also important to mention that one native Finnish speaker accidentally participated in the test. As the studied online language learning platform is aimed at foreigners, the respondents' observations were considered invalid and removed.

## 5.7 Usability test analysis and key findings

In order to analyse the Usability test, the received results were divided into two groups based on the respondents' level of the Finnish language: Group A with lower level skills and Group B with higher level skills. After that the answers were summarised in categories that refer to the big topics mentioned during the test: (1) Number of foreign languages, (2) Call-to-action button, (3) Visual appearance, (4) Responsive layout, (5) Interactivity, (6) Navigation, (7) Main page structure and content, (8) Lesson page structure and content, (9) Missing functionality and (10) Other suggestions. Finally, detailed tables were created (Appendix 4).

In general, respondents in Group A do not speak more than three languages, while respondents in Group B speak three or more languages. The responses, mostly critical, received in categories (1) to (9) are summarised in Table 8 below. The last category (10) with suggestions on lesson structure and notes about video quality is skipped here.

Table 9 Pivot table of the usability test results

| Category | Group A | Group B |
|---|---|---|
| Call-to-action button | Should be on the top of the page or could be in both places. | Should be on the top of the page. |
| Visual appearance | One person dislikes but could not explain the reason. In general, it is nice and with good colours. | Nice with good colours. |
| Responsive design | Good | Good |
| Interactivity | Animations and interactive elements, self-checked assignments and elements that help to track personal progress. | Self-checked assignments are suggested to be implemented as well as elements that help to personal progress. |
| Navigation | The navigation bar across the pages suggested for implementation three times. | The top-bar navigation menu is suggested once. |
| Main page structure and content | Not enough data to summarise. | Not enough data to summarise. |

| | | |
|---|---|---|
| Lesson page structure and content | Liked how lesson is divided into categories. | Liked how lessons are divided into categories and the variety of the available materials.<br>Lack of instructions is marked twice. |
| Missing functionality | Payment system, information about prices, Customisation, “Contact” page, Review. | Feedback form, Discussion forum, Information about prices, FAQ, Fav-icon, Reduce the amount of links to Quizlet. |

According to the results (Table 9), the call-to-action button should be on the top of the main page. Navigation requires significant improvement and more instructions, should be provided. Interactivity could be considered as the next area to focus on. However, good feedback about the structure of the lesson page can be considered as a success.

# 6 IMPLEMENTATION

## 6.1 The website improvement

The prototype website is modified based on the usability test results:

1. The second call-to-action button is on the top of the main page for those who are already familiar with the project.


Image 25 The top part of the main page with a call-to-action button

2. A short instruction on how to go through the lesson is added on the course page as well as on the lesson page.
3. A progress bar is implemented on the lesson page. It indicates the number of tabs which are viewed from the beginning to the end.


Image 26 Progress bar and Instructions on the lesson page

4. Quizlet was embedded into the page. It gives additional interactivity and usability. Users no longer need to jump to the separate Quizlet website.

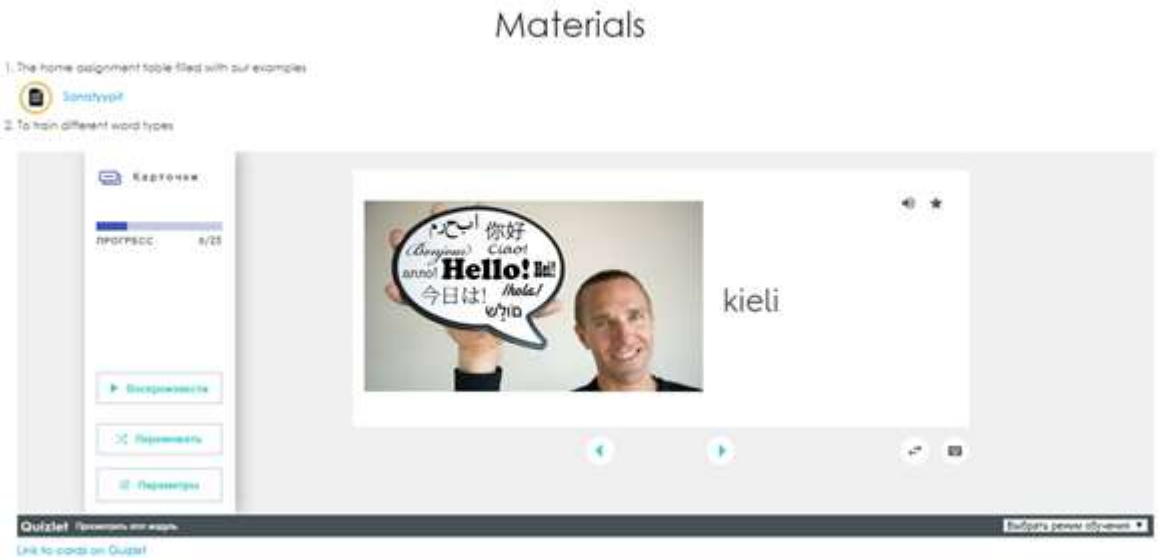


Image 27 Integrated Quizlet on the lesson page

5. The favicon of the website is created.

6. Navigation is realised for inner pages. This improves navigation because it gives users an understanding of where in the website they are located and how to get to the main page or course page.
7. A contact webpage is added. However, as the company is not real, the page is left empty.
8. The function of a personal account is in process. Users can sign up, verify their email and log in to the website.

## 6.2 Future implementations

The conducted research revealed some wishes the respondents would like to see on the website. The implemented features are listed in section 6.1. The features mentioned in this chapter have not been implemented yet because this would require a company registration. Therefore, the following could implemented in the possible next iteration of product development.

The implementation of prices and payment methods requires additional work. Firstly, an in-depth study of competitor platforms and their price policy should be conducted. Secondly, the company registration would need to be done. Thirdly, organisations such as banks and tax officials would need to be contacted.

The research – usability test and benchmarking – revealed that interactive elements are a significant part of functionality. The required element to make the user-friendly platform are personal account and tutorial or onboarding. A tutorial or onboarding helps determine objectives and offers relevant materials. A personal account shows the list of finalised courses, the progress bar of the current course. Also, the history of payments is stored there. However, these features are beyond the scope of the current thesis.

Another part of further implementation is creating a community. Creating an online chat and forum, as well as social media groups, is an essential part of involving new members. This demands a significant amount of time and a team of developers and testers.

# 7 CONCLUSIONS

## 7.1 Summary

The thesis discusses the online learning platform structure, its layout and types of study materials which could be published on the lesson page. The results of the conducted studies answer the main research question and subquestions which were presented in Chapter 1. Regarding research methods, a combination of qualitative and quantitative research methods was chosen to collect data. Cross-tabulation, word frequency analysis and categorisation were then applied for data analysis. The thesis applies a product development process which includes the following stages: exploration, creation, reflection and implementation. A review of these stages is given in Chapter 3.

Two kinds of data were collected to create a prototype language learning website. The survey of a defining the most common requirements to the online learning platform structure was conducted through Google Forms. The survey results allowed to find out the most popular types of study materials people prefer on online courses: theory in video form, theory in text form, resources with home assignments and links to additional resources including interactive platforms like Quizlet.

A benchmarking analysis was conducted to compare five online language learning platforms. The results were grouped into three categories (functionality, teaching and materials) and fifteen sub-categories (interface, landing page colours, contrast rate based on WebAim results, main page load speed score based on Google Speed test, the responsiveness of the layout, navigation, onboarding, call-to-action availability, interactivity, learning methods, topics covered, provided materials, and available communication sources). The typical features of functionality include three to four colour schemes, a responsive design, a call-to-action button, high loading speed, onboarding and some interactive elements, for instance, a progress bar. The lesson page should include video and text materials.

The results of the survey and benchmarking analysis provided a basis for creating the prototype of the online learning platform for learning the Finnish language. The first iteration prototype was developed according to the minimum viable product principle. The prototype includes a main page, a course page and a lesson page. All functionality and features, noted in the survey and benchmark analysis, were implemented in the first iteration. The exceptions are onboarding and a personal user account, which were not implemented due to limitations described in Chapter 6.2.

The usability test of the prototype was conducted on two focus groups based on the level of the respondents Finnish language skills:  Group A had lower and Group B had higher level language skills. The results showed that users liked the structure of the lesson, attractive design and the variety of the provided study materials. The website's functionality needs some improvements such as displaying a call-to-action button on the top of the main page, navigation and course instructions, and an interactive progress bar.

The prototype was improved based on the results of the usability test. Also, possible future implementations for the next iterations were discussed.

## 7.2 Answers to the research question and sub-questions

The research question and two sub-questions were formulated in Chapter 1.2. The research question is:

- What functions and requirements should be implemented on a language learning website?

The following sub-questions are:

- What are the most popular types of study materials and how should they be organised on a lesson page of a language learning website?
- What kind of layout design is the most suitable for a language learning website?

Based on the results, the answer to the research questions is: the typical features of language learning website include three to four colour scheme, a responsive design, a personal user account, high loading speed, interactive onboarding and a progress bar to track personal progress.

The answer to sub-question 1 is: the materials should be for people who do not have much free time. Thus, the structure should be clear and simple. The materials should contain all the required information for understanding the topic so that users do not have to waste time looking for extra materials and additional sources. The lesson page should include theory in video form, theory in text form to study the theory afterwards, resources with home assignments and links to additional resources to discover more about grammar or work on vocabulary. A course page should contain detailed information about the course structure and how to work during the course as well as links to social media channels, group discussions.

The answer to the sub-question 2 is: The layout of the main page of online learning website consists of two parts: the top block with the name of the website and the call-to-action

button, the second part with the simple and short description of the platform and its advantages. The lesson page structure includes instructions how to follow the lesson, video and text explanation of the theory, the tabs with a homework assignment, interactive exercises, vocabulary, additional materials, culture aspect and feedback form.

## 7.3 Reliability and validity

Reliability and validity are two metrics every research should satisfy. Reliability measures the stability of the results when the experiment is repeated, while the concept of validity means that the conclusions the researchers make are based on reliable data. (Saunders, Lewis & Thornhill 2007, 149–150.)

The thesis is reliable as the theoretical part of the research is based on on reliable sources such as books, research articles, professional journals, statistical data and reports. The empirical data were collected through an online survey and with two focus groups. The survey questions allow identifying respondents who were not familiar with online learning to exclude them from results. The focus groups were divided by the level of their Finnish language skills. Both groups answered identical questions. Thus, all data has been received from reliable sources. Reliable methods of data collection and data analysis have been applied to process results. Key findings based on these data gave answers to the research question and subquestions.

## 7.4 Suggestions for further research

This thesis researches what functions and requirements should be implemented on the very first steps of the development of a language learning website. However, for existed platforms to gain a better idea it is recommended to implement a study about how colours affect the language learning process: do colours affect the language learning process, and why do many language learning platforms use blue and white colours as was observed in the benchmarking process?

Additionally, the key motivation factors that could improve the engagement and retention of the users of online learning platforms deserve to have a full separate study that can be very beneficial for edtech businesses.

To continue current research, the next iteration of the platform development could be tested with a new group of users, to create a new prototype based on the results.

The research of the online learning platform structure for disabled people is another big study which could be implemented in the future. As well as creating special versions of the

platform for people with different disabilities because colours, fonts, sizes, types of study materials are varied for people with different types of disability.

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APPENDICES

## 1 Survey

General questions:

- What is your gender?
    - Male
    - Female
    - Prefer not to say
- What is your current occupation? (multiple choice question)
    - Student
    - Part-time worker
    - Full-time worker
    - Unemployed
- Do you have any online courses at the moment or did you have any recently?
    - Yes
    - No

Questions related to the course structure:

- How much time do you spend for course studying in a week?
    - Less than 2 hours
    - 2 – 4 hours
    - 4 – 6 hours
    - More than 6 hours
- In what forms are materials presented at the course? (multiple choice question)
    - Theory in video form
    - Theory in text form
    - Presentation(s)

    - References to additional information
    - Meetings with teacher(s)
    - Self-check home assignment
    - Home assignments
    - Mentor's help
    - Webinars with teacher
    - Group discussions/social media channels (group)
    - Other.. (free response)
- What kinds of materials do you lack of? Why?
- How do you prefer to see course organisation?
    - No blocks
    - The course is divided into blocks, according to theory
    - The course is divided into blocks, according to themes. After each theme students could already apply received knowledge

Questions related to additional materials:

- What memorizing techniques do you use / what is most effective for you?
- Whether are you using any additional programs or applications for better memorising?
    - Yes
    - No
- What kind of applications?

1.1 Responses https://drive.google.com/open?id=1kDKhRcD7NCb-NcgHiKrurUPDhJLk0hPq

## 2 Usability test questions

General questions:

- How many foreign languages do you speak?
- What is your background in Finnish language study?

Specific questions:

- Was it easy to find the course from the main page?
- What do you like about our prototype? Why
- What do you dislike about our prototype? Why?
- What would you like to add to our prototype? Why?
- Additional suggestions:

## 3 Usability test results

**Respondent 1**

General questions:

1. How many foreign languages do you speak?

- Three, but two in a basic level.

2. What is your background in Finnish language study?

- I have finished all Finnish language courses at LAMK.

Specific questions:

3. Was it easy to find the course from the main page?

- Yes, because there is only 1 button that links to the course.

4. What do you like about our prototype? Why?

- I like that mostly website is white and black and all-important things are yellow. There is one landing page with all info and there is no need to browse the website for a long time.

- I like how lessons is divided into categories like “theory”, “homework” and so on.

5. What do you dislike about our prototype? Why?

- In my opinion some navigation can be added, because for example from the course page there is no links to the main page or to the “learn Finnish” page. So, I don’t really like to click to the page to the logo all the time.

6. What would you like to add to our prototype? Why?

- Navigation/ menu as I said above

7. Additional suggestions:

**Respondent 2**

General questions:

1. How many foreign languages do you speak?

- Two, English and a little Finnish

2. What is your background in Finnish language study?

- I attend some courses in University. I can handle a small conversation.

Specific questions:
3. Was it easy to find the course from the main page?

- Not so easy. I don’t think having the link to the course at the bottom of main page is a good idea.

4. What do you like about our prototype? Why?

- Visually okay, the links work.

- I like the animations in the nav-bar (one with a theory, homework). Responsiveness is nice.

5. What do you dislike about our prototype? Why?

- The front/main page is not really interesting. Difficult to find course from the main page.

6. What would you like to add to our prototype? Why?

- Some animations and interactive elements, transitions for main page. Make it easier to find the course from main page.

7. Additional suggestions:

**Respondent 3**

General questions:

1. How many foreign languages do you speak?

- Three

2. What is your background in Finnish language study?

- Finnish For Foreigners 1

Specific questions:
3. Was it easy to find the course from the main page?

- Yes.

4. What do you like about our prototype? Why?

- It is intuitive.

5. What do you dislike about our prototype? Why?

- Overall design

6. What would you like to add to our prototype? Why?

- Add interactive learning elements, something like in Duolingo and phone app.

7. Additional suggestions:

**Respondent 4**

General questions:

1. How many foreign languages do you speak?

- Three languages: Finnish, English, German.

2. What is your background in Finnish language study?

- [I attend] three Finnish courses in Lahti University of applied Sciences.

Specific questions:
3. Was it easy to find the course from the main page?

- Yes.

4. What do you like about our prototype? Why?

- Nice design and colors, easy to use and find information, scroll up button.

- Moreover, the homework part is user-friendly, especially that you can download homework.

5. What do you dislike about our prototype? Why?

- I did not like that, for example, in theory part of lesson five there is no quick navigation.

- If I'd like to continue my lessons and pay, I couldn't find info how to do that.

6. What would you like to add to our prototype? Why?

- To add anchors to enable free navigation.
- Payment info, where to sign up for courses.

7. Additional suggestions:

- Perhaps, the feature that user can add and modify homework in website itself.

**Respondent 5**

General questions:

1. How many foreign languages do you speak?

- One. English

2. What is your background in Finnish language study?

- Very basic. I have completed four Finnish courses in the first two years of my study.

Specific questions:

3. Was it easy to find the course from the main page?

- It's quite hard because there is no navigation bar to link directly to course.

4. What do you like about our prototype? Why?

- The color is neutral and eye friendly. Nicely designed and simple to use.
- Responsive to many devices.

5. What do you dislike about our prototype? Why?

- Doesn’t have navigation bar-> quite inconvenient for users to go through the whole page to find the link to courses.

- Doesn’t seem like the webpage has any customization function. For example: users’ emails to notify new lessons or users’ accounts to track progress. The name of the webpage is quite irrelevant, at least, for me. I don’t think it’s easy to find the website again if I forget the name.

6. What would you like to add to our prototype? Why?

- Navigation bar-> save time to find info.

- Email requirement-> better interaction with users.

7. Additional suggestions:

**Respondent 6**

General questions:

1. How many foreign languages do you speak?

- Two.

2. What is your background in Finnish language study?

- Self-study, internet, job, university courses.

Specific questions:
3. Was it easy to find the course from the main page?

- It’s at the bottom of the page on the mobile, might not be the best choice.

4. What do you like about our prototype? Why?

- The websites design is simple, and I like how lessons are provided.

5. What do you dislike about our prototype? Why?

- Mobile home page needs tweaking, you need to scroll to far down.

6. What would you like to add to our prototype? Why?

- “Contact” page, choice tests implemented on the web site itself.

7. Additional suggestions:

**Respondent 7**

General questions:

1. How many foreign languages do you speak?

- Four.

2. What is your background in Finnish language study?

- Uni courses: 1,5 years + self-study: 1 year.

Specific questions:
3. Was it easy to find the course from the main page?

- I did not know what I was looking for – there is no course structure or any explanation on what is behind "Watch a free lesson" button. So in short : no, it wasn't.

4. What do you like about our prototype? Why?

- Overall, the website look good. It is simple, not overflown with information and relatively easy to navigate.

- The teacher in the video seems very positive and as if he really is enjoying what he is doing.

5. What do you dislike about our prototype? Why?

- The website look unprofessional.

  Front page:

  The first thing I see is a gigantic photo of a random lady – she is not one of the teachers, is she the woman behind the whole idea? The face of the brand? Who is she? Why do I have to look at her? Her smile does not even look genuine. There is a random person at the top, and the link to the sample lesson at the very bottom. I don't get the idea behind this design decision, so neither will the others.

  Memory training is mentioned a lot, but is not explained whatsoever. How is this relevant for learning Finnish? It sounds very interesting, therefore it would be nice to actually understand it.

  "Watch a free lesson" – grammatically incorrect and not actually fitting the purpose.

  Lessons page:

  The video and the text on the right of it are not adjusted to the same level.

  Vocabulary is the only word which didn't fit into the button, however – it is not the longest, which is weird. It also gives a random link or passage when hovered over (none of the others do).

  Spaces between titles, subtitles, and paragraphs under ‘Theory’ are not equal.

  Ask teacher – grammatically incorrect.

  **Privacy policy is a fake button –** there is actually no privacy policy. This is against European regulations and the website should be taken down.

6. What would you like to add to our prototype? Why?

- Move the sample lesson to the top. No one would go so far down if not specifically asked for.

- More info about Memory training, a better explanation of the Finnish course structure.

7. Additional suggestions:

- In video I liked the teacher, however there is no consistency in design – fonts, sizes and colors of the words appearing on the screen are too random. There are lots of pauses and noises which could've been cut out. Overall, the video is informative, which is the most important point, however it – again – does not seem professional and therefore makes the whole business seem less trustworthy.

**Respondent 8**

General questions:

1. How many foreign languages do you speak?

- I speak English and a little bit of Finnish and Spanish.

2. What is your background in Finnish language study?

- I studied the basics of Finnish at my university (LAMK) and now I continue learning the language at Helsinki Summer University. My current level is A2.

Specific questions:

3. Was it easy to find the course from the main page?

- Yes, it was easy, but still, I would prefer to have a button on the top of the page as well (just in case if I am already familiar with the company, so I do not have scroll down and go through all of the information again.)

4. What do you like about our prototype? Why?

- I especially like the design. It is attractive. It also points out the important things on the website. The mobile version is well-established as well. Regarding the educational platform itself, well, I liked everything. It is very useful that you have both video and text so I can decide which format works the best for me. I also like the list of keywords, so I can easily get an idea about the agenda of the video. My favorite part is Quizlet. For me, lists in Quizlet are absolute must-have for modern language schools and I was really pleased to see them.

5. What do you dislike about our prototype? Why?

- Well, nothing special comes to my mind. I would like to have some kind of a personal account showing my progress, things to do etc.

6. What would you like to add to our prototype? Why?

- As I said before, I would like to add some kind of personal account. I would also add more information about the prices, length of the courses and reviews because otherwise I still have too many questions.

7. Additional suggestions:

- All of my suggestions are really minor things, so in general, I just want to say that I really like the prototype.

**Respondent 9**

General questions:

1. How many foreign languages do you speak?

- 3 excl. my native language

2.What is your background in Finnish language study?

- I've been studying Finnish language since elementary school, where I got an excellent base.

Specific questions:

3. Was it easy to find the course from the main page?

- It was easy

4. What do you like about our prototype? Why?

- It can be a really nice learning platform once thoroughly developed and diversified.

5. What do you dislike about our prototype? Why?

- no answer

6. What would you like to add to our prototype? Why?

- I would recommend to add material not only reg. grammar and written language, but also slangi and puhekieli for someone who has a sufficient language skills level to advance further, as you won't normally hear a Finnish person talking in the same language that's used in literature.

7. Additional suggestions:

- The website can suggest ways to enhance skills, e.g. provide some reading materials, links to Finnish YouTube channels, music, movies, etc.

**Respondent 10**

General questions:

1. How many foreign languages do you speak?

- I speak three languages.

2. What is your background in Finnish language study?

- I lived in Finland for over twenty years and studied the Finnish language in a special class for one year and after that studied the Finnish language in middle school, high school.

Specific questions:

3. Was it easy to find the course from the main page?

- Yes, it was easy to find it. The main page is quite plain and simple what makes it very intuitive.

4. What do you like about our prototype? Why?

- I like it quite a lot. Even I, who know the Finnish language on a quite good level is willing to try someday your lesson for real and complete all the queues. I believe that your project can help many people because there is so less such courses online for though who want to learn the Finnish language. Even information what you're getting from universities, different social courses, etc. is usually not enough for those who want to learn Finnish for real and because of that, there will be demand for such knowledge!

5. What do you dislike about our prototype? Why?

- Maybe there is too much information. Or maybe there are just no instructions for beginners how you need to complete the lesson. What you need to do first: watch the video or read through the theory? Go through materials and maybe then watch the video... and what about this culture part and vocabulary? User needs some instructions on how to use your course because there is so much material at one lesson. It is not a bad thing that there is so much everything, on the contrary.

6. What would you like to add to our prototype? Why?

- Users own page where he can track his progression.

- It would be great if you can embed quizzes into a webpage, and users do not need to be redirected to another page.

- Maybe chat service?
- F:A:Q
- Favicon

7. Additional suggestions:

- You must launch this project, i believe it will be a success.

**Respondent 11**

General questions:

1. How many foreign languages do you speak?

- I speak 4 languages and I just started to learn the fifth.

2. What is your background in Finnish language study?

- I was studying Finnish in the school in Finland for two years, and I practise it in everyday life.

Specific questions:

3. Was it easy to find the course from the main page?

- It was easy to find the course. The information is put clearly.

4. What do you like about our prototype? Why?

- Good idea, clearly collected information. Colours do not interrupt. The important information, vocabulary, materials referred to the lesson is collected well.

5. What do you dislike about our prototype? Why?

- Maybe a native Finn could be better teacher (to hear the real pronunciation), however, on this site and on level it is appropriated method. The teacher speaks slowly and clearly.

6. What would you like to add to our prototype? Why?

- I would add nothing else.

7. Additional suggestions:

Just go ahead and develop the process in this way.

**Respondent 12**

General questions:

1. How many foreign languages do you speak?

- I can speak in two foreign languages. I speak fluently in English and I have some knowledge of Finnish.

2. What is your background in Finnish language study?

- I moved to Finland 4 years ago. I was studying Finnish intensively at University and I have taken some private lessons at that time. At the moment, I am working full-time and it is hard for me to find enough time to practice Finnish.

3. Was it easy to find the course from the main page?

- It was easy to find the course from the main page.

4. What do you like about our prototype? Why?

- I really like the variety of study options available on the website. You can choose between watching the theory video, reading the theory chapter or learning by completing the exercises. I also find it very convenient that all the materials on the website can be easily accessed from computer and phone.

5. What do you dislike about our prototype? Why?

- The prototype is done very well. It would be good to have more content.

6. What would you like to add to our prototype? Why?

- I would prefer to have more interactive content. For example, more grammar exercises where you would get your answers checked instantly. It would be also great to have some kind of metrics that would show how much course material I have completed. This would help me to track the progress I have made.

7. Additional suggestions:

no answer

**Respondent 13**

General questions:

1. How many foreign languages do you speak?

- Three

2. What is your background in Finnish language study?

- I hope, I have B2 level of finnish, but I haven't done any of the Finnish Level exams in Finland, so I don't really know. I have been studying it for almost three years in Nordic School in Moscow.

3. Was it easy to find the course from the main page?

- Yes, it was easy to find the course from the main page.

4. What do you like about our prototype? Why?

- Right amount of the information about the course, the site doesn't consist of lots of useless details.

- Pictures and descriptions of teachers
- Quite easy to find necessary info
- Really good color combinations

5. What do you dislike about our prototype? Why?

- Free lesson offer should not be at the bottom of the page, because nowadays people are not likely to read or scroll a lot of info, but they concentrate more on smth that they can watch or listen.

6. What would you like to add to our prototype? Why?

- The site can also have a feedback box or page where people can give their opinions about the course or ask some questions to teachers.
- You can also make a short video about the idea of the course and put it on the top of the page.

7. Additional suggestions:

Watching the video was not boring, there were a lot of descriptions and pictures of words, what made it more interesting. However, the consistency of the video is really poor and makes a bad impression. The speech was understandable and not fast, but maybe quite hard for beginners.

I really like that there are useful materials after the video and a lot of examples of it. That's actually a good way to learn: to listen, to read by yourself and then just to use and repeat until you will get it.

**Respondent 14**

General questions:

1. How many foreign languages do you speak?

- I have two foreign languages in my active usage (English and Swedish) and my German language in a passive state.

2. What is your background in Finnish language study?

- All in all 4 years with no significant result due to lack of motivation and professional means of education. At the same time I was also engaged in studying Swedish and it did not feel right to actively study two languages. Two attempts with a group twice a week in Finland. I could not continue the education because I could not catch up with the more advanced participants who constituted the majority of the group. The other reason was that I did not find possible to use “Hyvin menee” as the basic textbook. It was written in Finnish and explained grammar incomprehensibly. The third attempt with a Finnish speaking person who did not have pedagogical skills and could not explain anything.The fourth attempt was with a private teacher which was the most successful of all attempts but we could not continue out of other reasons.

3. Was it easy to find the course from the main page?

- If you mean the free lesson, it was neither easy nor difficult. I was just following the information downwards. Though the link to the lesson could have been placed on top of the site. In my opinion the web-site lacks a top-bar menu where one can see the direct link to the lessons.

4. What do you like about our prototype? Why?

- I like the promise that I will easily grab the theory and quickly remember the words. I tend to believe this promise.

- It is a very nice idea to put other materials as well. One can’t learn the language only by studying the words. One has to dive into the whole new world which combines cultural and historical aspects.

5. What do you dislike about our prototype? Why?

- Nothing specifically. Though it could have been nice to try the lesson with memorizing the words.

6. What would you like to add to our prototype? Why?

- As I mentioned above, probably a top-bar menu and sections with the information how to become a member of the learning program and feedback.

7. Additional suggestions:

- I like the video lesson. It feels a bit so that there is additional noise together with the voice in the video. Sometimes the English text appears later than the accompanying Finnish words and several times it took away my attention. I feel it easier when the accompanying text is shown simultaneously with the text being pronounced. However, one can see the video as many times as needed, so finally it is not that crucial. I find also an idea to show the words and their transformations in the video really nice.

- However, it may also be so that the whole subject is too huge for one video lesson. Too much to digest for one time.

## 4 Usability test processed results

4.1 Group A

https://docs.google.com/spreadsheets/d/1jiXKHzWYH9MH7VlJwZQQ3MPC-y4oc_AHZz96jVvdCWQ/edit#gid=273706027

| | Respondent 1 | Respondent 2 | Respondent 3 | Respondent 4 | Respondent 5 | Respondent 6 | Respondent 7 |
|---|---|---|---|---|---|---|---|
| **Number of foreign languages** | Three | Two | Three | Three | One | Two | Three |
| **Call-to-action button** | – | Should be on the top of the page | – | – | – | Bottom of the page might not be the best place | CTA button could be both on the top and on the bottom of the page |
| **Visual appearance** | Liked the colour scheme | "Visually OK" | Dislike | Liked colour scheme | Nice Colours are "neutral and eye friendly" | Simple design | Attractive design |
| **Responsive design** | – | Nice | – | – | "Responsive to many devices" | – | Well-established |
| **Interactivity** | – | Poor. Animations and interactive elements could be added | Poor. Interactive learning considers as a plus | Liked scroll up button. Suggested to add features that allow adding and modifying homework in the website itself | – | – | Poor. Suggested to implement "personal account showing my progress and things to do" |
| **Navigation** | Poor. "no links to the main page or to the 'learn Finnish' page." | Poor. "Difficult to find (the) course from the main page." | Intuitive | Poor. Navigation inside the lesson considers as a plus | Poor. There is "no navigation bar to link directly to course". | – | – |
| **Main page structure and content** | All info provided and there is no need to browse the website for a long time. | Is not informative | – | – | – | Require improvement. Dislike scrolling too far down. | – |
| **Lesson page structure and content** | Liked how lessons are divided into categories –"theory", "homework" | | – | User-friendly | – | – | "It is very useful that you have both video and text." List of keywords shows more about lesson topic." Lists in Quizlet are absolute must-have for modern language schools" |
| **Missing functionality** | – | – | – | Payment system and information about prices | Customisation is poor. options are users' notification via email, personal account implementation | "Contact" page and Self-check assignments are suggested. | Lack of information about prices, length of the courses. Review is missed. |
| **Other suggestions** | – | – | Phone app considered as a big plus | – | The name of the pages (URL) is not easy to remember. | – | – |

4.2 Group B

https://docs.google.com/spreadsheets/d/1jiXKHzWYH9MH7VlJwZQQ3MPC-y4oc_AHZz96jVvdCWQ/edit#gid=565890576

| | Respondent 1 | Respondent 2 | Respondent 3 | Respondent 4 | Respondent 5 | Respondent 6 | Respondent 7 |
|---|---|---|---|---|---|---|---|
| **Number of foreign languages** | Four | Three | Three | Five | Two | Three | Three |
| **Call-to-action button** | Should be on the top of the page. | – | – | – | – | Should not be on the bottom of the page. | Should be on the top of the page. |
| **Visual appearance** | Simple, not overflown with information. | "It can be a really nice learning platform once thoroughly developed and diversified." | "Plain and simple what makes it very intuitive". | Good | – | Good colour scheme. | – |
| **Responsive layout** | Grammar mistakes. | – | – | – | Good: "All the materials on the website can be easily accessed from computer and phone." | – | – |
| **Interactivity** | | – | Suggested to implement "personal page" showing progress. | – | Poor. Self-checked assignments are suggested to be implemented as well as elements that help to track the progress the user has made. | – | – |
| **Navigation** | Simple | Nice | – | – | – | – | Poor. "The web-site lacks a top-bar menu where one can see the direct link to the lessons". |
| **Main page structure and content** | Poor. No structure. Lack of information, possible improvement is "better explanation of the Finnish course structure." | – | – | The information is put clearly | – | "Right amount of the information about the course, the site doesn't consist of lots of useless details." | – |
| **Lesson page structure and content** | The text is not aligned correctly. Privacy policy page is missing. Tab icons are inconsistent. | The website can suggest ways to enhance skills – links to Finnish Youtube channels, music, movies, some reading materials. | Lack of instructions. "User needs some instructions on how to use your course because there is so much material at one lesson." | Liked that "the important information, vocabulary, materials referred to the lesson." | Liked "the variety of study options available on the website" | Lack of information about the goals. Suggested to " make a short video about the idea of the course and put it on the top of the page." The consistency of the video is really poor and makes a bad impression. | "It is a very nice idea to put other materials as well" |
| **Missing functionality** | | – | "Embed quizzes into a webpage." Chat service. FAQ. Favicon | – | – | Discussion forum and feedback form | Information about prices and feedback form. |
| **Other suggestions** | There is "no consistency in video design - fonts, sizes and colors of the words appearing on the screen are too random. There are lots of pauses and noises which could've been cut out." | I would recommend to add material not only reg. grammar and written language, but also slangi and puhekieli | – | "A native Finn could be better teacher (to hear the real pronunciation)" | – | The consistency of the video is really poor and makes a bad impression. | To make lesson smaller. To improve the quality of the video. |

# 5 Tables of word frequency

## 5.1 Table 1

| Term | Count | Trend |
|---|---|---|
| word | 5 | 0.034965035 |
| quizlet | 4 | 0.027972028 |
| apple | 3 | 0.02097902 |
| app | 2 | 0.013986014 |
| art | 2 | 0.013986014 |
| built | 2 | 0.013986014 |
| dictionary | 2 | 0.013986014 |
| google | 2 | 0.013986014 |
| history | 2 | 0.013986014 |
| languages | 2 | 0.013986014 |
| ms | 2 | 0.013986014 |
| studying | 2 | 0.013986014 |
| uni | 2 | 0.013986014 |
| videos | 2 | 0.013986014 |
| voice | 2 | 0.013986014 |
| youtube | 2 | 0.013986014 |
| application | 1 | 0.006993007 |
| apps | 1 | 0.006993007 |
| arts | 1 | 0.006993007 |
| assessment | 1 | 0.006993007 |
| calendar | 1 | 0.006993007 |
| cards | 1 | 0.006993007 |
| chinese | 1 | 0.006993007 |
| context | 1 | 0.006993007 |
| course | 1 | 0.006993007 |
| coursera | 1 | 0.006993007 |
| culture | 1 | 0.006993007 |
| depends | 1 | 0.006993007 |
| diagrams | 1 | 0.006993007 |
| diary | 1 | 0.006993007 |
| dictionaries | 1 | 0.006993007 |
| different | 1 | 0.006993007 |
| dive | 1 | 0.006993007 |
| doing | 1 | 0.006993007 |
| duolingo | 1 | 0.006993007 |
| foreign | 1 | 0.006993007 |
| forvo | 1 | 0.006993007 |
| github | 1 | 0.006993007 |
| hear | 1 | 0.006993007 |
| i'm | 1 | 0.006993007 |
| immediately | 1 | 0.006993007 |
| iphone | 1 | 0.006993007 |
| japan | 1 | 0.006993007 |
| japanese | 1 | 0.006993007 |
| khanacademy | 1 | 0.006993007 |
| like | 1 | 0.006993007 |
| listen | 1 | 0.006993007 |
| memorizing | 1 | 0.006993007 |
| memrise | 1 | 0.006993007 |
| mimind | 1 | 0.006993007 |
| native | 1 | 0.006993007 |
| neuronation | 1 | 0.006993007 |
| nhk | 1 | 0.006993007 |
| notepad | 1 | 0.006993007 |
| notes | 1 | 0.006993007 |
| official | 1 | 0.006993007 |
| online | 1 | 0.006993007 |
| picture | 1 | 0.006993007 |
| place | 1 | 0.006993007 |
| pronounced | 1 | 0.006993007 |
| recorder | 1 | 0.006993007 |
| reminders | 1 | 0.006993007 |
| speaker | 1 | 0.006993007 |
| special | 1 | 0.006993007 |
| speech | 1 | 0.006993007 |
| studio | 1 | 0.006993007 |
| subjects | 1 | 0.006993007 |
| tatoeba | 1 | 0.006993007 |
| technique | 1 | 0.006993007 |
| test | 1 | 0.006993007 |
| tiny | 1 | 0.006993007 |
| translate | 1 | 0.006993007 |
| tried | 1 | 0.006993007 |
| virtualbox | 1 | 0.006993007 |
| visual | 1 | 0.006993007 |
| vocabulary | 1 | 0.006993007 |
| watch | 1 | 0.006993007 |
| watching | 1 | 0.006993007 |
| world | 1 | 0.006993007 |

## 5.2 Table 2

| Term | Count | Trend |
|---|---|---|
| lack | 3 | 0.014851485 |
| mentor | 3 | 0.014851485 |
| courses | 2 | 0.00990099 |
| difficult | 2 | 0.00990099 |
| faster | 2 | 0.00990099 |
| language | 2 | 0.00990099 |
| material | 2 | 0.00990099 |
| materials | 2 | 0.00990099 |
| stress | 2 | 0.00990099 |
| study | 2 | 0.00990099 |
| videos | 2 | 0.00990099 |
| 2d | 1 | 0.004950495 |
| 3d | 1 | 0.004950495 |
| academically | 1 | 0.004950495 |
| additional | 1 | 0.004950495 |
| animation | 1 | 0.004950495 |
| art | 1 | 0.004950495 |
| assignment | 1 | 0.004950495 |
| books | 1 | 0.004950495 |
| case | 1 | 0.004950495 |
| cds | 1 | 0.004950495 |
| chat | 1 | 0.004950495 |
| communication | 1 | 0.004950495 |
| content | 1 | 0.004950495 |
| correct | 1 | 0.004950495 |
| course | 1 | 0.004950495 |
| detailed | 1 | 0.004950495 |
| discussion | 1 | 0.004950495 |

| Term | Count | Trend |
|---|---|---|
| easy | 1 | 0.004950495 |
| example | 1 | 0.004950495 |
| examples | 1 | 0.004950495 |
| excluding | 1 | 0.004950495 |
| explaining | 1 | 0.004950495 |
| explanation | 1 | 0.004950495 |
| explanations | 1 | 0.004950495 |
| feedback | 1 | 0.004950495 |
| general | 1 | 0.004950495 |
| good | 1 | 0.004950495 |
| grammar | 1 | 0.004950495 |
| guideline | 1 | 0.004950495 |
| hard | 1 | 0.004950495 |