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Online materials in language teaching

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Abstract: The aim of this master's thesis was to generate a framework for utilizing online materials in teaching languages in Finnish upper secondary schools. The framework was created in three cycles following design-based research methodology. The initial version of the framework was developed based on previous research. Further development of the framework was carried out by conducting two case studies. The first case study consisted of an online survey and an in-service training session aimed at Finnish upper secondary school language teachers. The second case study focused on an in-service training session aimed at upper secondary school subject teachers in general.

The finalized framework emphasizes teachers' pedagogical goals, the new upper secondary school core curriculum, and the digitalization of the matriculation examination as the basis for utilizing online materials in language teaching. The framework also stresses the importance of concrete examples, encourages a more experimental mindset, and reminds of the importance of supporting students' needs. Finally, the framework highlights the benefits of online materials and creates a positive atmosphere of defeating potential challenges related to utilizing online materials in language teaching with practical solutions.

Keywords: Online materials, language teaching, upper secondary school, core curriculum, matriculation examination, in-service training.

Suomenkielinen tiivistelmä: Tämän pro gradu –työn tavoitteena oli luoda malli verkkoaineistojen hyödyntämiselle kieltenopetuksessa suomalaisissa lukioissa. Malli luotiin kolmessa syklissä kehittämistutkimuksen metodologian mukaisesti. Mallin ensimmäinen versio kehitettiin aiemman tutkimuksen perusteella. Mallia kehitettiin seuraavissa sykleissä laatimalla kaksi tapaustutkimusta. Ensimmäinen tapaustutkimus koostui verkkokyselystä ja täydennyskoulutustapaamisesta, jotka oli suunnattu suomalaisten lukioiden kieltenopettajille. Toinen tapaustutkimus keskittyi yleisesti lukion aineenopettajille suunnattuun täydennyskoulutustapaamiseen.

Valmis malli painottaa opettajien pedagogisia tavoitteita, uutta lukioiden opetussuunnitelmaa ja digitalisoituvia ylioppilaskirjoituksia perustana verkkoaineistojen hyödyntämiselle kieltenopetuksessa. Malli korostaa myös konkreettisten esimerkkien tärkeyttä, rohkaisee kokeilevampaan ajattelutapaan ja muistuttaa opiskelijoiden tarpeiden tukemisen tärkeydestä. Lopuksi malli nostaa esille verkkoaineistojen hyötyjä ja luo positiivista ilmapiiriä, jossa mahdolliset haasteet, joita verkkoaineistojen hyödyntämiseen liittyy, voidaan ratkaista käytännönläheisesti.

Avainsanat: Verkkoaineistot, kieltenopetus, lukio, opetussuunnitelma, ylioppilaskirjoitukset, täydennyskoulutus.

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1 Introduction

In Finnish upper secondary schools, the first digitalized matriculation examinations have already taken place in autumn 2016 and the reformed upper secondary school core curriculum has been put into practice (Finnish National Board of Education 2016; Opetushallitus 2015, Ylioppilastutkintolautakunta 2015a). These changes have resulted in an increased need for teachers' in-service training in topics dealing with information and communication technology (abbreviated ICT). This master's thesis aims to answer language teachers' in-service training needs related to using online materials in their teaching by creating a framework for utilizing online materials in teaching languages. This kind of a framework will be a useful tool for language teachers in Finnish upper secondary schools, as the teachers need to consider their teaching from a more digitalized perspective.

The creation of the framework is approached from a design-based research perspective in three cycles. The basis for the framework is created by combining points of view from the upper secondary school core curriculum, the guidelines for the digitalization of the matriculation examination, and findings of previous research on how online materials are used in teaching at the moment both in Finland and abroad. The framework is developed further by planning and executing two case studies, and data is gathered through an online survey, feedback, group work, and observations.

This thesis consists of eight chapters. The introductory chapter presents the target of this thesis. The second chapter describes design-based research methodology used in this thesis and the research questions which this thesis aims to answer. The third chapter deals with the theoretical background of the thesis. It consists of the upper secondary school core curriculum from the point of view of online materials, the digitalization of the matriculation examinations, perspectives to online materials and their usage in language teaching, and teachers' in-service training as a way to educate teachers' on online materials. The fourth chapter explains the research design in detail. In chapters five, six, and seven, the process of developing the framework for utilizing online materials in language teaching in three

cycles is described in detail. The thesis ends in chapter eight which contains discussion and evaluation of the findings in the three design cycles.

2 Design-based research and research questions

This chapter introduces the design-based research methodology used in this study and presents the research questions which this study aims to answer. More precisely, the definitions and core elements of design-based research, challenges related to its implementation and issues concerning validity and reliability of design-based research are reflected on. The application of design-based research to this particular study is also elaborated on at the end of this chapter.

The roots of design-based research can be found in the articles written by Brown (1992) and Collins (1992). Their goal was to test and improve educational settings by designing interventions which have a strong theoretical basis. Additionally, they wanted to overcome the restrictions of laboratory settings. Design-based research has gained in popularity in the 21st century in the educational field and especially in interventions which are concerned with educational technology (Anderson & Shattuck 2012; Pernaa 2013, 10–11). It works well in technology-enhanced learning environments as it can be used to produce justifiable and plausible solutions to current challenges due to its characteristics which emphasize research in real-life settings (Heikkinen, Kontinen & Häkkinen 2006, 68; Wang & Hannafin 2005).

Several articles aim at defining the core elements of quality design-based research (Anderson & Shattuck 2012; Barab & Squire 2004; Edelson 2002; Heikkinen et al. 2006; Juuti & Lavonen 2006; The Design-Based Research Collective 2003; Wang & Hannafin 2005). Generally, design-based research is pragmatic as it focuses on both theory development and practical research results (Barab & Squire 2004; Heikkinen et al. 2006, 67; Juuti & Lavonen 2006; The Design-Based Research Collective 2003; Wang & Hannafin 2005). A significant intervention is designed and tested and what results is new theory and a concrete artifact or abstract structure which explains or facilitates learning and teaching (Anderson & Shattuck 2012; Barab & Squire 2004; Heikkinen et al. 2006, 71; Juuti & Lavonen 2006).

The aim for a study designed according to design-based research principles should be at solving a problem or generating improvements in the natural learning setting (Anderson & Shattuck 2012). The concrete artifact resulting from the intervention can be, for instance, a course or some type of teaching material. In addition to this concrete artifact, the study produces information about the benefits of this artifact and the development process in general (Aksela & Pernaa 2013, 181). The artifact produced in a study conducted through design-based research should outlast the study and be useful to other researchers or teachers in the future (Kelly 2004).

Design-based research is based on prior theoretical knowledge, new theoretical knowledge created during the design process, and practice in naturalistic classroom/learning settings (Anderson & Shattuck 2012; The Design-Based Research Collective 2003; Wang & Hannafin 2005). The genuine educational context ensures validity, especially when combined with previous related research (Anderson & Shattuck 2012; Juuti & Lavonen 2006). Design-based research focuses on understanding real-world situations and emphasizes context as a part of the learning situation (Barab & Squire 2004). One part of this context and real-life setting is the natural interaction and cooperation between the researcher and the participants during the design process (Anderson & Shattuck 2012; Heikkinen et al. 2006, 69; Juuti & Lavonen 2006; Wang & Hannafin 2005).

Design-based research is iterative in nature as the research process takes place in cycles where experiments, analysis and redesign rotate (Anderson & Shattuck 2012; Heikkinen et al. 2006, 69; Juuti & Lavonen 2006; The Design-Based Research Collective 2003; Wang & Hannafin 2005). Each design cycle enables evaluation of the design procedure and making changes, for example, by adopting new methods if necessary (Aksela & Pernaa 2013, 186; Barab & Squire 2004; Heikkinen et al. 2006, 71; Juuti & Lavonen 2006). Thus design-based research can be defined as a flexible research method (Wang & Hannafin 2005).

Studies following design-based research methodology are integrative as mixed methods are used whenever possible (Anderson & Shattuck 2012; Wang & Hannafin 2005). Several research methods can be utilized at the same time or in succession and both quantitative

and qualitative methods can be applied to the same study. This leads to a deeper and more comprehensive understanding of the issue at hand and higher credibility. (Barab & Squire 2004; Wang & Hannafin 2005.) Using mixed methods can be associated with contextuality as the research results are closely related to the design process and the real-life research setting where surprising changes can take place without warning (Wang & Hannafin 2005). Thus the interventions need to be planned thoroughly, taking into consideration several possible chains of events (Heikkinen et al. 2006, 69).

The effectiveness of design-based research can be evaluated by determining the sustainable impacts of the designed intervention and the possibilities of applying the results to wider audiences (The Design-Based Research Collective 2003). The scientific quality of a study can be improved by evaluating the designed artifact in an authentic environment. Thus the insights into the thoughts of the actual users and their experiences are especially valuable when evaluating the artifact (Aksela & Pernaa 2013, 194).

Aksela and Pernaa (2013) have observed design-based research methodology especially from the point of view of master's theses conducted in Finnish universities. They emphasize four steps for a master's thesis to realize one cycle in a design-based research process:

1. Theoretical problem analysis
2. Empirical problem analysis
3. Development phase
4. Reporting

In the theoretical problem analysis phase the focus is on prior studies and finding a gap to be filled. The empirical problem analysis phase consists of complementing the research needs that have risen during the theoretical problem analysis. This can be done through, for example, a survey or an interview. The development phase is based on the two previous phases and consists of creating the initial artifact. The design cycle ends in reporting the research process in detail. (Aksela & Pernaa 2013, 185–186.)

As stated already before, design-based research is iterative and consists of cycles (Anderson & Shattuck 2012; Heikkinen et al. 2006, 69; Juuti & Lavonen 2006; The Design-Based Research Collective 2003; Wang & Hannafin 2005). A master's thesis consisting of merely one cycle is not scientifically as reliable as it could be and often at least another design

cycle is added to produce a more reliable study (Aksela & Pernaa 2013, 186). The second cycle starts after the development phase by another empirical problem analysis where the initial artifact is tested in an authentic setting. This is followed by a second development phase in which the artifact is developed based on evaluations. (Aksela & Pernaa 2013, 186.)

When reporting the design process it is reasonable to explain the different cycles in chronological order (Aksela & Pernaa 2013, 190). The report needs to be detailed enough so as to give the reader a reliable and comprehensive picture of the development process. Thus the report should include the development goals which are combined to theory and context, a detailed description of the research frame to guarantee the possibility of evaluating the changes between the different design cycles, explanations of why and what kind of changes were made during the cycles, and reflection on the possibilities and challenges related to the development process. (Collins, Joseph & Bielaczyc 2004.) All this aims at scientific reliability as the objective is to guarantee that the reader can repeat the research arrangements if desired. In practice, this is, however, not anywhere near possible in most cases as exactly the same target group may not be available and duplicating the authentic situation may not be possible to realize. (Aksela & Pernaa 2013, 190.)

One challenge related to design-based research methodology is that generalizing the research results to other or larger populations may be difficult. This is because the studies do not always have enough subjects to study. (Kelly 2004.) Additionally, Kelly (2004) criticizes the natural context being anything but natural when considering the impact the researcher has in the research situation. It may also be challenging for the researcher to join the two roles of designer and researcher (Barab & Squire 2004). Conducting design-based research does not consist of merely observing but a researcher more or less induces the interactions which then should be evaluated and used for making conclusions. This is a clear challenge to validity. On the other hand, Barab and Squire (2004) also state that a researcher has more possibilities to develop the design and explore the different aspects of the particular context when taking an active role in the research situation, thus producing more reliable theory.

One further challenge is the complicated nature of the research data (Heikkinen et al. 2006, 72). Mixed methods and possibly several types of data may prove to be challenging for the researcher. Thus it is necessary to evaluate the need for more than one or two research methods and the concrete benefits of multiple data for the design process. Design-based research methodology is used in real-life situations which are by no means simple but can produce interesting information and new theories to support learning and teaching. (Heikkinen et al. 2006, 70.) From the point of view of master's theses, it is especially challenging for a budding researcher to overcome the multiple phases of the research process and understand the theoretical and structural complexity of the research method. On the other hand, the design-based research method does support the researcher's professional development towards being a teacher as researcher. (Aksela & Pernaa 2013, 181.)

2.1   Application of design-based research to this thesis

In this thesis, design-based research methodology was used in in three iterative cycles to create a framework for utilizing online materials in teaching languages. The design process was founded on three major themes. First, the upper secondary school core curriculum and the guidelines for the digitalization of the matriculation examination were considered from the point of view of supporting the utilization of online materials. Second, previous research on how online materials can be used in language teaching and what kind of challenges and benefits are related to using online materials were considered. Third, principles of how in-service training in ICT-topics should be conducted were examined.

During the design cycles, Finnish upper secondary school teachers participated in the design process by answering an online survey, giving feedback in an in-service training session, and participating in group work in another in-service training session. The teachers' participation was extremely significant in the design process as their answers to the online survey confirmed the initial contents of the framework, and their feedback and participation in group work brought interesting additions to the framework. This was all complemented with the trainer/researcher's observations of the in-service training sessions.

The teachers' answers to the online survey were analyzed and grouped into themes by the researcher. The first in-service training session was recorded in order to help the researcher find confirmation to the observations made during the in-service training session. The second in-service training session was not recorded but there was another trainer present who confirmed the trainer/researcher's observations. Observations can be criticized for being subjective. The recording of the first in-service training session and the other trainer in the second in-service training session aimed to decrease this subjectivity. Teachers' answers to the online survey were analyzed qualitatively by using content analysis, and teachers' feedback, group work discussions, and researcher's observations were used to complement this analysis.

The changes in the Finnish upper secondary school setting, resulting from the new core curriculum and the digitalization of the matriculation examination, have led to an increased need for teachers' in-service training. The design process in this thesis was conducted in an authentic in-service training context. The teachers participated in real in-service training sessions and the researcher worked as the trainer. Thus the roles of a researcher and a trainer were combined. The concrete result of the design process is an online in-service training course for upper secondary school teachers in a digital learning environment. Ultimately, the design process resulted in the framework for utilizing online materials in language teaching. The potential of the framework in the general Finnish upper secondary school subject teaching context, in addition to the narrower language teaching perspective, was also considered.

2.2   Research questions

The goal of this thesis is to create a framework for utilizing online materials in language teaching. The research questions of this thesis are:

1. How can online materials be used to support language teaching?

2. What kind of benefits do online materials have in language teaching?

3. What kind of challenges are related to using online materials in language teaching?

3   Theoretical problem analysis

This chapter consists of the theoretical problem analysis of this thesis. The first subchapter focuses on the upper secondary school core curriculum from the point of view of online materials. The second subchapter introduces the digitalization of the matriculation examinations, and the third subchapter discusses online materials and their usage in language teaching. The fourth subchapter covers issues related to teachers' in-service training.

3.1   Upper secondary school core curriculum

The national core curriculum is the most important document which guides teaching in Finland. It includes the general and subject specific values and goals, contents and methods, and student assessment. The core curriculum reflects the society and its values. (Luukka, Pöyhönen, Huhta, Taalas, Tarnanen & Keränen 2008, 53.) The Finnish National Agency for Education (Opetushallitus, formerly Finnish National Board of Education) is responsible for preparing the national core curriculum which determines the objectives and core contents for upper secondary school teaching. Each municipality and upper secondary school prepares their own local core curriculum which is based on the national model. (Finnish National Agency for Education 2017; Ministry of Education and Culture 2017; Opetushallitus 2016a.)

According to the conception of learning in the national core curriculum for upper secondary schools, learning is the result of "the student's active, goal-oriented, and self-directed actions" (Finnish National Board of Education 2016, 14). Learning takes place when "the student interprets, analyses, and evaluates information presented in different formats, constructs new knowledge and thus deepens his or her competence based on previous experiences and knowledge" (Finnish National Board of Education 2016, 14). Interaction between other learners and the surrounding environment is a notable feature of learning (Finnish National Board of Education 2016, 14).

The core curriculum emphasizes that learning environments and methods should be chosen so that they support students' abilities, interests, understanding and distinctive learning

needs. All in all, the goal is to teach and guide students with diverse methods and give them possibilities to study in versatile ways. (Finnish National Board of Education 2016, 14.) Critical and creative thinking is promoted by encouraging students to examine different types of contexts and problems, experimenting with different types of techniques and methods, and developing their problem solving skills. Learning is fostered through meaningful learning experiences, topics and phenomena which the students can relate to and which they can experience for themselves in the surrounding society. ICT is used to support learning both inside and outside the educational institution in versatile situations and tasks. Students are encouraged to utilize digital learning environments, materials and different types of tools so that they will learn to acquire and evaluate information presented in different formats and also to produce and share material they have produced themselves. (Finnish National Board of Education 2016, 15.)

The general objectives of upper secondary school education underline students' possibilities of becoming educated members of the society who have gained knowledge and skills called for in the changing society and required for lifelong learning. Other important skills are to develop students' information acquisition and application skills as well as their problem-solving skills, multiliteracy and ways to assess information reliability. Students are also required to learn appropriate, responsible and safe ways to use ICT both when working independently and with other students. (Finnish National Board of Education 2016, 34.)

The upper secondary school core curriculum contains cross-curricular themes which can be addressed across the boundaries of individual subjects. These themes cover different aspects of working life, components of well-being, ingredients of a sustainable lifestyle, knowledge of cultures and internationality, understanding of multiliteracy and the media, and interaction between technology and society. (Finnish National Board of Education 2016, 35.)

For the scope of this thesis, multiliteracy is a central concept. "Multiliteracy refers to the skills of interpreting, producing, and assessing texts in different forms and contexts. Media literacy is part of multiliteracy." (Finnish National Board of Education 2016, 39). Multi-

literacy consists of a broad definition of texts meaning that a text can be composed of "systems of verbal, visual, auditive, numeric, and kinaesthetic symbols and their combinations" (Finnish National Board of Education 2016, 39).

During upper secondary school studies, students should deepen and develop their skills in multiliteracy and learn to interpret, produce and assess diverse texts. Students should also become competent in seeking, choosing, using and sharing diverse texts when acquiring information and studying. For example, cooperation between subjects, versatile learning environments, emphasizing students' own ideas and environments where students act naturally in their everyday lives develop students' multiliteracy skills effectively. Multiliteracy can, all in all, be supported by using ICT in variable ways. (Finnish National Board of Education 2016, 39.)

The aim of the cross-curricular theme technology and society is "to enhance the student's understanding of the interaction between technological and societal development" (Finnish National Board of Education 2016, 39). Students gain practice in creativity and problem-solving, and learn appropriate ways to use technology as they operate in different types of digital environments (Finnish National Board of Education 2016, 40.)

In addition to the general guidelines presented above, the core curriculum sets objectives for each of the subjects in particular. Teaching languages is based on a broad definition of text as both spoken and written language. The aim is to foster and enhance students' multiliteracy, and students' leisure time language use is taken into consideration. Lifelong language learning skills are accumulated by identifying students' own learning preferences, allowing them to evaluate their own progress in learning, and emphasizing the importance of language skills in working life. Inquiry-based learning and versatile, student-oriented methods are central in language teaching. Students also use ICT when it supports language learning naturally. The learning tasks are created to be meaningful, open-ended and adequately challenging for the students, and differentiation and other means are used to support students to advance at their own individual pace in learning. (Finnish National Board of Education 2016, 114.)

3.2 Digitalization of the matriculation examination

In Finland, general upper secondary education is one option for studies after compulsory basic education. The studies usually take three years and culminate in the matriculation examination. The matriculation examination consists of a minimum of four compulsory tests. After passing all the compulsory tests the candidate receives a matriculation examination certificate. (Finnish National Agency of Education 2017; Matriculation Examination Board 2017; Opetushallitus 2016b; Ylioppilastutkintolautakunta 2016h.)

The Matriculation Examination Board (Ylioppilastutkintolautakunta) operates under the Ministry of Education and Culture, and is in charge of the quidelines and instructions for the matriculation examination. In 2013, the Board launched the Digabi project whose aim is to digitalize the matriculation examination tests. The first digitalized tests were organized in autumn 2016 in three subjects (German, geography, and philosophy) and all tests will be digital in 2019. All the phases of the digitalization project have been gathered to the Digabi project website[1]. (Matriculation Examination Board 2015; Ministry of Education and Culture 2017; Digabi 2016; Ylioppilastutkintolautakunta 2016e.)

The Matriculation Examination Board organized a voluntary mock examination in Finnish as a mother tongue in autumn 2015 and obligatory mock examinations in geography, philosophy, and basic level German in spring 2016. These mock examinations gave upper secondary schools the possibility to test examination arrangements hands-on and gave the Matriculation Examination Board valuable information on how to implement the examinations. The Board also organized a so-called catastrophe mock examination where all imaginable problem situations were dealt with. (Lattu 2015; Ylioppilastutkintolautakunta 2016g; Ylioppilastutkintolautakunta 2016f.) In addition to these mock examinations, the Matriculation Examination Board has also provided upper secondary schools with a digital course examination system Abitti[2] which upper secondary schools have been able to utilize in course examinations. This has given teachers, students, and those responsible for school

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[1] https://digabi.fi
[2] http://www.abitti.fi

ICT systems the possibility to get familiar with the system to be used in the digitalized matriculation examinations. (Abitti 2016; Matriculation Examination Board 2015.)

The Matriculation Examination Board has issued general instructions on how the digitalized matriculation examinations are to be arranged (Ylioppilastutkintolautakunta 2016j). They have also issued specific instructions concerning each subject from the point of view of digitalization. These instructions include information on the timetable for the digitalization of each subject, the duration of the test and the contents of the tasks, the hardware and software required for the tests, and examples of materials that can be used in the digitalized tests. (Ylioppilastutkintolautakunta 2016e.)

3.2.1 Digitalization of the language examinations

The Matriculation Examination Board consists of subject specific sections which are in charge of preparing and evaluating the examination tasks. Each section consists of subject specific experts and each language has its own section. The Languages Committee (Kielivaliokunta), which consists of representatives of each of the language sections, is in charge of the general definitions for all language subjects in the matriculation examination. An additional smaller language development group consisting of representatives of the Languages Committee and the Matriculation Examination Board officials has also been preparing the digitalized language examinations. (von Zansen 2015.)

The digitalization of the Finnish matriculation examination language tests is based on digitalized language examinations already organized both in Finland and abroad. The greatest change in the tasks will be in the format as the tasks will no longer be restricted to paper notebooks but they can contain audiovisual material and look similar to their original counterparts in the real world. The task types will vary in the different examinations and the goal is to make the task more diverse in the course of time. There have been sketches of enabling the use of electronic aids such as proofreading tools or dictionaries, free use of the Internet, or language tests where the examination adapts to a student's language skills during the digitalized examination. (von Zansen 2015.)

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The general instructions for the digitalization of the language examinations emphasize the same notion of language competence as the upper secondary school core curriculum. The examination tests the basic language activities of listening comprehension, reading comprehension, written production, and vocabulary and grammar command. The materials used in the examinations are based on a new kind of a notion on texts being both spoken and written language. The materials can include multiple forms of media such as text and pictures or the material for a listening comprehension test may be in the form of a video or a video can be used for inspiration before writing. Authenticity will be emphasized by including, for example, texts in their original format. (Ylioppilastutkintolautakunta 2015b.)

The general instructions introduced above have been supplemented by concrete example tasks provided by the Digabi project. The examples of digitalized tasks for different subjects have been available on the Internet pages of the Digabi project since 2014. The tasks have been created by the members of the Matriculation Examination Board who represent the various subjects covered in the examination. They are also responsible for preparing the actual matriculation examination tasks and thus the example tasks equal the actual matriculation examination tasks well. Upper secondary school teachers have been able to prepare themselves and their students for the digitalization of the matriculation examinations by following the example of these tasks. (Digabi 2015.)

The language example tasks on the Digabi website are divided into listening comprehension, reading comprehension, written production, and grammar and vocabulary example tasks and further to different languages, and advanced and basic courses. The materials used in the example tasks are visual or audiovisual such as videos for listening comprehension or pictures as answer alternatives for listening or reading comprehension. There is also an example of a task where an authentic online text is used for reading comprehension, and writing tasks which are prompted with pictures, a video, an infograph, and a mind map. (Digabi 2015.)

The Matriculation Examination Board gave specific instructions to teachers and students of German before the actual digitalized matriculation examination in autumn 2016. It was emphasized that the digitalized examinations have more varied task types, digitalization

makes it possible to include pictures, videos and recordings in the tasks, and multiple media types can be found in one task. Also the possibility to use more authentic material was stressed. (Ylioppilastutkintolautakunta 2016d.)

Teachers and students of basic level German had the possibility to practice the digitalized examinations in spring 2016. The tasks in this mock examination contained pictures and videos, and a reading comprehension text had been taken from a discussion forum. In addition to answer alternatives, pictures were also used as illustrations to bring the students to the theme of each task. (Ylioppilastutkintolautakunta 2016a; Ylioppilastutkintolautakunta 2016b.)

In the basic level German digitalized examination in autumn 2016, both listening comprehension and reading comprehension tasks had pictures as answer alternatives, and students were asked to watch a video and answer questions. Students were also asked to combine text with the correct speech bubble in a cartoon. (Abitreenit 2016.)

Starting spring 2017 there will no longer be a separate listening comprehension part in the examination. The aim is to make the examination more authentic and include different skills in different types of tasks. When tasks include videos, students can pause and rewind the video and there is no limit to how many times the video can be watched. (Ylioppilastutkintolautakunta 2016c; Ylioppilastutkintolautakunta 2016i.)

3.2.2   Matriculation examination as a high stakes test

The Finnish matriculation examination can be defined as a high stakes test. High stakes tests can be used to make comparisons and rank students, schools, or educational systems. Students' results in a high stakes test can determine their admission to further levels of education, and the results can also have a high influence on how, for example, the government, the media, parents, or students choosing schools evaluate schools, teachers, and teachers' skills. (Boardman & Woodruff 2004; Chapman & Snyder 2000.) Teachers use high stakes tests also in the concrete classroom level to assess their students' learning and the quality of their own teaching as high stakes tests are considered a practical way of following and evaluating students' learning (Boardman & Woodruff 2004). In Finland, the

Ministry of Education and Culture (Opetus- ja kulttuuriministeriö 2016) has published a report on how matriculation examination results and students' overall studies in upper secondary school could be, on the one hand, taken into account more in university and university of applied sciences entrance examinations and, on the other hand, how qualification requirements could be formulated so that they would encourage students to invest more in studying, for example, languages and advanced mathematics in upper secondary schools.

High stakes tests are one way for educational authorities to influence practice at school. This can be a positive thing as it can, for example, lead to improving teachers' pedagogical practices. Teachers tend to teach to the test if they know that learning will be tested with a high stakes test at the end of the studies (Boardman & Woodruff 2004; Chapman & Snyder 2000; Luxia 2005). Teachers' pedagogical responses to teaching material and topics reflect the demands of high-stakes tests (Au 2007). According to Au (2007) high stakes tests have a notable influence on the content and pedagogical approaches in the classroom.

Changes in national high stakes tests can lead to teachers changing their teaching in order to ensure that their students do well in the tests (Boardman & Woodruff 2004; Chapman & Snyder 2000). If test preparation can be made more efficient, new methods are put into operation (Boardman & Woodruff 2004). For example, mock tests are organized to prepare the students for the test format, answering techniques, and the testing environment (Luxia 2005).

High stakes tests cause additional pressure to teachers and if a new method does not seem to have clear benefits in regard their students' performance, teachers do not adopt it (Boardman & Woodruff 2004). When high-stakes tests cause pressure, teaching may be more teacher-centered and fact-driven (Au 2007). Still, high stakes tests can also be seen to have a positive impact on teaching and learning as new and improved teaching methods and pedagogical approaches may be implemented (Luxia 2005). Simultaneous changes in high stakes tests and the core curriculum may lead to pedagogical changes, as well (Au 2007). This may have an effect in the contents covered in teaching as topics which are not tested in high stakes tests are often excluded in the curriculum and thus also in teaching (Au 2007).

Making notable changes in high stakes tests may lead to challenges. For example, teachers' content knowledge or pedagogical skills may not be sufficient to make the necessary changes, and this sets further demands on teachers' in-service training in general and teachers' possibilities to take part in in-service training in particular. Teachers may be uncertain of how to realize the new requirements in their teaching and concrete classroom activities. (Chapman & Snyder 2000.) Chapman and Snyder (2000) emphasize that teachers should be helped to understand the changes made in the high stakes tests and take in the reasons behind the changes. Additionally, sufficient time to prepare students for the changes is essential in getting teachers to support the change.

The changes in the format or content of the test should be complemented with motivational factors encouraging teachers to develop their teaching. When teachers aim at improving their teaching for better learning results, they also respond to changes in the tests more positively. (Chapman & Snyder 2000.)

3.3 Online materials in language teaching

Successful language learning depends on many factors such as the teacher, the teaching approach, the materials used, the duration and intensity of studies, and the characteristics of the student (Varmış 2015.) Attempts to harness the potential of the Internet as a resource for language learning and teaching have been around since the early 1990s (Shetzer & Warschauer 2000, 171).

Kern (2014) states that it is not a question of whether to use the Internet in your teaching or not but that teachers simply need to equip their students with skills that they need online. The Internet is a very notable part of modern day culture (Berardo 2006). For example, 87 % of 16 to 89-year-old Finns used the Internet in one way or another in 2015, 97 % of 16 to 24-year-olds used the Internet daily, and 68 % of Finns used the Internet many times per day (Tilastokeskus 2015).

The goal of the learning process provides the direction for teaching (Laurillard 2002, 58) and thus pedagogy should always come first when planning to implement new materials, tools, or ways of working into language teaching (Kubler 2010, 69). The teacher's goals

should also be made clear to the students (Laurillard 2002, 74) and the students should, all in all, be the center of the planning process (Blake 2013, xxi; Luukka et al. 2008, 26). Gilmore (2007) emphasizes the importance of learning aims when choosing materials for teaching. According to Gilmore (2007) the goal should be to give learners the necessary skills so that they are able to communicate effectively in the target language.

The core curriculum, the textbook, and teachers' own experiences and principles influence the targets set for learning (Luukka et al. 2008, 151). It is important to set the targets because learning to learn cannot be fulfilled if students do not know what they are supposed to learn. Pihkala-Posti (2012b) finds it important to consider the pedagogically meaningful ways of presenting teaching materials, different content, and topics. The goals set in the curriculum need to be specified in more detail as learning objectives, and only then can the teacher choose the materials used in the learning process (Laurillard 2002, 181).

Teacher's own interests and technology skills have an influence on which working methods and which materials are used in the classroom (Luukka et al. 2008, 84). The traditional mindset of the teacher as the keeper and distributor of accurate knowledge and correct answers is rooted extremely deep both in teachers', parents' and students' minds (Pihkala-Posti 2012b). Pihkala-Posti (2012b) comforts teachers that they need not be and basically cannot be omniscient. It is good to give students responsibility, for example, as technical experts. This makes them more committed to the learning process and this also gives the teacher a possibility to learn more. Students should also have a say in what kind of material is used and they should be asked for feedback on, for example, the quality of the material (Wang & Smith 2013). When the teacher has a firm view about how languages are taught they can include new methods to their teaching more fluently (Berardo 2006; Gray, Pilkington, Hagger-Vaughan & Tomkins 2007).

In the world of languages, texts are becoming more and more visual and technology is becoming more and more commonplace. As languages change so should also language teaching change. (Pihkala-Posti 2012b.) The society as an even more complex media world, students' varying skills and their experiences also outside school, the core curriculum, and teaching goals should be used to create a new kind of pedagogy (Luukka et al 2008, 25).

Pihkala-Posti (2012a) found two groups of students who find online materials especially motivating. First, boys who are interested in computers and technology in general and, second, girls who are interested in languages and cultures and who get to approach language learning from a new point of view online. Students' likes, dislikes and moods should be acknowledged more in the teaching process as their exploitation leads to more successful language learning (Varmış 2015). Learners are individuals with personal needs and thus approaching learning and teaching with merely one approach or method is not feasible (Kubler 2010, 71).

Authenticity is a term which surfaces repeatedly when online materials are examined. Authentic materials are what students encounter outside the classroom when, for example, travelling or studying abroad (Berardo 2006). As teachers need to prepare students for language used outside the classroom, authentic materials should be used (Berardo 2006). Authenticity can be defined as real communication and material which is meaningful to the students (Pihkala-Posti 2012a). Material becomes authentic when it is used in an active learning process where students acquire concrete and memorable experiences of using the material and target language (Kaikkonen 2000, 54).

The Internet can be utilized when bringing the teacher's and students' worlds closer to each other (Oksanen & Koskinen 2012, 66–67). With the help of online materials teachers can get to the same wavelength with the students (Blake 2013, xi). Students, all in all, spend much more time online, and taking this digital world as a part of teaching is especially important from the point of view of authenticity. It is not easy for students to see learning meaningful and authentic if interaction between their free time activities online and the learning situations at school is too scarce. (Pihkala-Posti 2012b.)

3.3.1 Choosing online materials

The range of material available for language teaching has increased enormously through the development of the Internet (Freda 2004, 242; Kubler 2010, 69) and it easy to access different types of materials online (Berardo 2006; Freda 2004, 244). Especially learning about contemporary culture and everyday life in the target country is possible on the Inter-

net (Gilmore 2007; Kern 2014; Kubler 2010, 70). All in all, the Internet is a great source of authentic materials (Berardo 2006; Blake 2013, 4, 10; Son 2007; Thomas 2014) such as, for example, texts and videos (Gilmore 2007; Oksanen & Koskinen 2012, 66–67; Perrault 2007) which can de divided according to different proficiency levels, styles of learning, and students' interest (Gilmore 2007).

Criteria for choosing online materials is similar to that of offline materials (Shin 2015). The materials need to be relevant to the topic and the amount of material to be delivered needs to be evaluated. These are important pedagogical factors. (Berardo 2006.) Additionally, when considering online materials, the teacher should pay attention to accuracy and propriety of content, credibility of websites used (Shin 2015), and linquistic complexity, the amount of new information provided, material length, and the teaching objectives (Thomas 2014; Varmış 2015). The material should also be examined more precisely from different angles to determine if it is suitable as teaching material in general (Berardo 2006).

From the students' point of view, the materials should be interesting, motivating, and relevant to the students' current situation in life and personal interests (Berardo 2006; Thomas 2014). The materials should engage the learner (Wang & Smith 2013) and challenge the students' skills without being too demanding linguistically (Berardo 2006; Thomas 2014). Online materials for teaching languages should not be too easy or too difficult (Kubler 2010, 72).

Finding the desired material for a specific teaching purpose on the Internet may be challenging and online searches may take time. Finding the proper terms to use in the searches is an art of its own. (Şahin, Çermik & Doğan, 2009.) As there are increasingly more materials on the Internet that could be used for teaching, teachers should aim to develop their skills in online searches. Teachers quite often use rather casual methods for searching information instead of systematic approaches. (Şahin et al. 2009.) Keyword searches are the most common way of searching but when using abstract search terms the need for synonyms or broader search concepts is necessary (Freda 2004, 249).

Thomas (2014) reassures teachers that they do become faster at locating and preparing authentic materials as they get more practice in it and, all in all, the overall enrichment

which follows from including authentic online materials in teaching is so rewarding to both teachers and students that it is well worth all the time spent searching (Thomas 2014). Acquiring authentic materials from abroad is also expensive whereas browsing the Internet for online materials costs only time (Berardo 2006).

Teachers should encourage students to search for authentic online materials as students' personal interests become clearer when they are invited to participate and provide their own examples of authentic materials in topics they are interested in (Thomas 2014). Students can use the Internet to become altogether more active in their own learning as they can utilize search engines, online dictionaries and encyclopedias, translation software, or, for example, grammar or vocabulary tasks provided by language learning websites (Gilmore 2007).

Especially in the Finnish educational setting but also abroad, teaching is often directed by textbooks that much that textbooks can be described as some sort of a hidden curriculum (Luukka et al. 2008, 63; Tomlinson 2011, 2). Book publishers renew their textbooks to respond to core curriculum changes, and textbooks are seen to influence strongly on what is considered to be central and important in learning. Textbooks influence the contents covered but also the methods used. Still, teachers have the possibility to choose which materials they use in their teaching and they can also reduce the power of the textbook. (Luukka 2008, 64–65.)

Textbooks contain non-authentic text designed for language learning. They are often artificial, do not contain natural variation, are perfectly formed, and repeat structures to guarantee student learning. (Berardo 2006.) It can be said that language in textbooks does not reflect language reality (Gilmore 2007). At schools, texts are quite often long and linear texts whereas on the Internet the materials include different types of media, and reading and information processing takes place differently. Studying languages based on linear texts may feel heavy, as this is not students' normal way of acquiring information any more and not similar to their free time activities. Thus online materials respond to the needs of the changing society. (Pihkala-Posti 2012b.)

3.3.2   Benefits related to online materials

Online materials provide possibilities for increased contact with the target language and culture, and it is useful for students to be exposed to real language in real contexts (Berardo 2006; Blake 2013, 2; Varmış 2015). Students need much input in the target language for language learning to occur (Blake 2013, 11). It is also possible to extend the classroom with the help of the Internet (Blake 2013, 11), and give students information of the real world around them (Berardo 2006).

The Internet interests students as it uses multimedia (Freda 2004, 244; Kubler 2010, 74) and the topics covered online are, all in all, extremely interesting to students (Wang & Smith 2013). Online materials, such as videos, music clips, or animations, can be used to diversify teaching and to illustrate or exemplify issues (Kern 2014; Oksanen & Koskinen 2012, 58, 63–64; Ottenbreit-Leftwich, Glazewski, Newby & Ertmer 2010). Hypertext gives a whole new meaning to the words illustrating and exemplifying (Pihkala-Posti 2012b). The Internet is visually stimulating and interactive (Berardo 2006). Combining text with pictures, audio or video makes the material more effective (Wang & Smith 2013). Especially audiovisual materials are a rich source of input, and they can be used in many different ways to improve students' communicative skills (Gilmore 2007).

Online discussions can be used to expose students to different genres, different types of language use, and varying types of media (Berardo 2006; Kern 2014). For example, blogs include vivid and quite short texts which are often accompanied by images or videos, cover topics from different points of view, and cater different perspectives (Thomas 2014). The same goes for online magazines and newspapers which cover current events, include true stories and fictitious material, and are complemented with maps, photos, illustrations, audio, and video (Freda 2004, 245; Thomas 2014).

Online materials include authentic contents and they are meaningful to students who spend significant amounts of time online (Pihkala-Posti 2012a). Authentic materials expose students to language that has significance in the real world (Freda 2004, 245), afford variation to the textbook, provide an opportunity to take students' interests and needs into account

more, cover a large variety of topics, and have an influence on students' motivation (Ottenbreit-Leftwich et al. 2010; Pihkala-Posti 2012b; Thomas 2014).

On the Internet, authentic language learning situations can be created in almost any language. The language of instruction on many sites and applications can be easily changed, and online materials offer possibilities for many types of language use. (Pihkala-Posti 2012b.) Current and multimodal online resources lead to authentic and inquiry-based learning experiences (Perrault 2007). Authentic materials have been noted to have a positive effect on students' attitudes towards studying and by using authentic materials the learning environment can be made more relaxed (Ottenbreit-Leftwich et al. 2010; Varmış 2015).

All in all, online materials activate students (Berardo 2006; Oksanen & Koskinen 2012, 66–67; Varmış 2015), give students a sense of achievement when understood, and encourage students to learn more (Berardo 2006).

3.3.3   Challenges related to online materials

Unreliability of technology, not having enough hardware, the available hardware being out of order, or the Internet connection not working are central and concrete problems which prevent teachers from using ICT in their teaching in general (Kubler 2010, 78; Oksanen and Koskinen 2012, 65). Students' attitudes may pose a challenge if they do not consider the Internet a natural part of the educational setting and associate the Internet only with their free time activities. Shortcomings in students' and teachers' skills hinder teaching and learning, and teachers may also consider online resources unnecessary and without added value to their teaching. (Oksanen & Koskinen 2012, 65–66.)

Online materials may be of poor quality, incomplete, inaccurate, or they may present cultural biases (Kubler 2010, 78). Online materials are often considered more low-grade than other materials as they have not been peer-reviewed or edited (Gilmore 2007). A large amount of online material is published without any review process and thus the teacher needs to evaluate the suitability of online materials from the point of view of, for example, appropriateness and accuracy (Shin 2015). Copyright issues need to be taken into account as well (Shin 2015).

Teachers are faced with time constraints and may feel pressured as online materials require them to spend time searching for materials and reviewing the materials for reliability (Perrault 2007). Teachers also become frustrated when they do not find materials suitable for their purposes (Perrault 2007). Many teachers report that they do not use online materials because of lack of time or because their search engine searches produce too much material (Oksanen & Koskinen 2012, 65; Perrault 2007).

Teacher's also feel challenged when having to select material to be presented to the students, sequencing the material so that not too much material is presented to the students at one time, and when presenting the material in the classroom on the whole (Kubler 2010, 71). It is clear that students should not be showered with material which may easily happen when all the materials available online can be linked with just a few clicks (Kubler 2010, 71).

Teachers may be aware that students' motivation for learning can be influenced by using the Internet in teaching but students' language level and evaluating students' performance may cause uncertainty (Liu & Kleinsasser 2015). Additionally, texts which combine sound, graphics, animation, video and text require students much more skill and critical thinking and they cannot be mere passive recipients of information. This challenges teachers' methods and teaching in general. (Kern 2014.)

Authenticity can also have its downsides. Authentic materials may include too in-depth cultural content which students find difficult to understand, the materials may become outdated quickly, the language used in the materials may be too challenging i.e. the vocabulary may be too specialized or the grammar structures too complicated, and, all in all, this may lead to preparation by the teacher or the students to take too much time (Thomas 2014). Thomas (2014), however, reassures that these challenges can be overcome, for example, by working with the same text in various ways, and including both speaking, listening, reading, writing, and grammar and vocabulary activities to cover the text.

Understanding can also be aided by giving students pre-reading tasks which may test or compensate for linguistic and socio-cultural shortages and activate students' prior knowledge of the subject. While-reading tasks activate the students while working on the

material, and post-reading tasks test understanding or give students tools to build on their prior knowledge. (Berardo 2006.) Thus, there is no need to simplify authentic materials by editing the difficult parts away but it is important to support students more while working on the material (Berardo 2006). Students should also be introduced to different ways of working with authentic materials according to how the materials are handled in real life (Berardo 2006). Not all materials are translated word for word and sometimes just, for example, skimming for the main points is enough (Berardo 2006).

Teacher support is central when integrating online materials into the classroom (Freda 2004, 248; Gilmore 2007). Students need to be given the possibility to focus on learning and reaching their learning goals. Gilmore (2007) states that all level students can use authentic materials as long as the materials and tasks related to them are planned carefully. Evaluating the difficulty of certain material depends on the learning contexts and the students.

Authentic material can be made easier to approach also by paying attention to the outward appearance of the material. If a text is stripped of pictures, diagrams, photographs, or videos, the text loses its context. The context should be included to aid the students in understanding the content but also in guiding the student in how to use the text. The attractive look of authentic material often also grabs students' attention well. (Berardo 2006.)

3.4   Teachers' in-service training on ICT topics

Topics related to ICT develop constantly and this creates a need for teachers' in-service training (Blake 2013, 13). Teachers are role models for their students on how to use ICT in their subject effectively, and at the same time they need to consider how ICT can be used to help their students learn (Krumsvik 2008).

3.4.1   In-service training in Europe and Finland

Across the EU, teachers of around 70 % of students at all grades are committed to increasing their knowledge in ICT outside working hours and teachers of around 40 % of students

at grades 11 both in general and vocational education have participated in courses focusing on the pedagogical aspects of ICT use (European Union 2013, 18–19). In the OECD teaching and learning international survey TALIS (Taajamo, Puhakka & Välijärvi 2015, 54), 91 % of secondary school teachers had taken part in different types of in-service sessions during 2013. In Finland the percentage was 84. The percentage of attendance is quite high but at the same time the amount of days of attendance is rather small (Taajamo et al. 2015, 55).

According to the report Opettajat Suomessa 2013 (Teachers in Finland 2013) (Kangasniemi, Hämäläinen & Kyrö 2014, 142, 143, 149) 82,9 % of upper secondary school teachers had taken part in in-service training in 2012. According to the report, not all teachers who need and want to take part in in-service training that is organized in some other municipality have the possibility to attend, as municipalities do not have enough financial resources. Especially hiring a substitute teacher to the teacher taking part in in-service training has proven to be challenging because of low financial resources. When compared to previous studies, teachers take part in in-service training more than before (Kangasniemi et al. 2014, 148).

Finnish teachers skills in ICT and interest in in-service training on ICT-topics is further charted with the Opeka tool (Opeka 2016). 84,5 % of subject teachers are interested in in-service training on digital contents and learning environments. Additionally 66,7 % of subject teachers are interested in in-service training which aims at integrating ICT into their own subject.

Teachers' confidence in their own ICT-skills and their participation in in-service training has been noticed to correlate (European Union 2013, 19). Taking part in in-service training results in more confident teachers (European Union 2013, 103). Confidence in ICT-skills may have an effect on how often teachers actually use ICT in their teaching as more confident teachers tend to use ICT more than their insecure counterparts. Hietikko, Ilves and Salo (2016, 20) have noticed that teachers who have received in-service training at least one day per year see digitalization more positively than those teachers who have not taken part in in-service training that much. These teachers consider digitalization an inspiring

addition, trust their own skills more, and as a consequence use ICT more and in more versatile ways in their teaching.

Most in-service training aimed at upper secondary school teachers is related to implementing the digitalized matriculation examinations and two out of three teachers have already been trained in one way or another. Almost as many teachers feel that they need training in this subject. It is likely that those teachers whose subjects will be among the first ones to be digitalized are the ones who have been taken part in in-service training. (Hietikko et al. 2016, 17-18.) Teachers are worried about not getting enough in-service training related to the digitalization of the matriculation examinations and about the sufficiency of their own skills (Hietikko et al. 2016, 32).

3.4.2   Carrying out in-service training

Typically in-service training on ICT-topics has covered technical details and ICT has been treated like an extra add-on to teaching (Almås & Krumsvik 2007). This type of in-service training cannot provide teachers with proper reasons for using technology in teaching. As pedagogical viewpoints are not considered enough, the added value to learning remains obscure. (Pihkala-Posti 2012b.)

The focus in in-service training should be on pedagogical and didactic questions and not on mere technology (Almås & Krumsvik 2007). Teachers expect in-service training to introduce ideas and pedagogical models for how to integrate ICT into their own teaching with emphasis on core curriculum and its goals (Hietikko et al. 2016, 18). There should also be a flexible relationship between teachers' content knowledge, pedagogical knowledge, and integration of ICT (Almås & Krumsvik 2007).

In-service training in general is considered successful when the contents, methods and timing is chosen based on the target group and the skills to be developed (Kangasniemi et al. 2014, 149). In-service training should focus on influencing teachers' values (Ottenbreit-Leftwich et al. 2010) attitudes, and their ways of seeing new possibilities (Almås & Krumsvik 2007; Kreijns, Van Acker, Vermeulen, & van Buuren 2013).

When teachers see new tools valuable in one way or another, they will more probably integrate them into their teaching. One important value is that of promoting student learning. Thus in-service training and professional development in general should underline the effects of new tools or methods on student learning. (Juuti, Lavonen, Aksela & Meisalo 2009; Ottenbreit-Leftwich et al. 2010.)

When the impact technology has on students is made tangible through examples, teachers may include technological solutions more readily to their own teaching (Ottenbreit-Leftwich et al. 2010). In general, when in-service training feels meaningful, teachers participate in it more eagerly and meaningfulness often comes from in-service training having a positive influence on the students (Juuti et al. 2009). When teachers are encouraged to evaluate the digital environments and their possibilities, they learn to understand their added value in their own subjects (Almås & Krumsvik 2007; Krumsvik 2008).

Teachers appreciate the possibility of sharing experiences with colleagues (O'Dowd 2015; Ottenbreit-Leftwich et al. 2010; Pihkala-Posti 2012b), discussing how to overcome difficulties in teaching (O'Dowd 2015), and getting support and concrete tips for tackling technical issues in in-service training (O'Dowd 2015). Especially hearing about others concrete experiences makes teachers more confident that the ideas actually are practicable in the classroom (Ottenbreit-Leftwich et al. 2010).

Discussions on the pedagogical aspects of ICT integration into teaching are best realized informally in small groups (Almås & Krumsvik 2007). As teachers get to share experiences, and listen to examples, their values and attitudes develop (Juuti et al. 2009). In-service training is also considered to be most influential when it is organized in an authentic environment for the participants (Hietikko et al. 2016, 32).

In-service training should emphasize current research, statistics, assessment and other convincing information to justify and instill new methods (Kangasniemi et al. 2014, 149). Teachers experience as subject teachers should also be used when introducing new methods (Almås & Krumsvik 2007).

In-service training should include both theoretical and practical activities (Pihkala-Posti 2012b) and focus on current issues in a way that teachers can utilize their new skills in

their everyday teaching straight away (Almås & Krumsvik 2007; Krumsvik 2008; Pihkala-Posti 2012b). Teachers also prefer in-service training sessions which include content-specific material (O'Dowd 2015). Thus the new tools or materials should be introduced in actual classroom settings to show teachers how they can implement them into their own classrooms (Ottenbreit-Leftwich et al. 2010).

4 Research design

During the academic year 2015–2016 the Department of Mathematical Information Technology at the University of Jyväskylä in cooperation with the Jyväskylä Educational Consortium (Jyväskylän lukiokoulutus) organized in-service training for upper secondary school teachers from the Central Finland area on different ICT themes. The goal for the in-service training sessions was to develop teachers' ICT skills and support their preparation for the digitalization of the matriculation examination. One of the sessions covered online materials in teaching and in January 2016 the session was aimed especially for language teachers. The in-service training sessions continued during the academic year 2016-2017 as the Faculty of Information Technology at the University of Jyväskylä organized in-service training in the Southern Savonia region. In January 2017, an in-service training session on online materials was organized for upper secondary school subject teachers in general. These in-service training entities provided the incentive for this thesis, and in the form of versatile case studies afforded the opportunity to collect detailed data for the research process.

The central point of view in this study was the iterative nature of design-based research (see chapter 2). The study was divided into three cycles and each cycle was planned so that it would produce different types of data so that the framework for utilizing online materials in language teaching could be developed. The first cycle consisted of a thorough analysis of the background literature and resulted in the initial version of the framework. The second and third cycle were executed as case studies. The first case study consisted of an online survey and an in-service training session for upper secondary school language teachers. The second case study consisted of an in-service training session for upper secondary school subject teachers in general. The data which originated from the two case studies were analyzed by using qualitative content analysis. To give a comprehensive idea of the research process, Figure 1 illustrates how the research process of this study developed in the different cycles, and what were the central elements and results of each cycle.
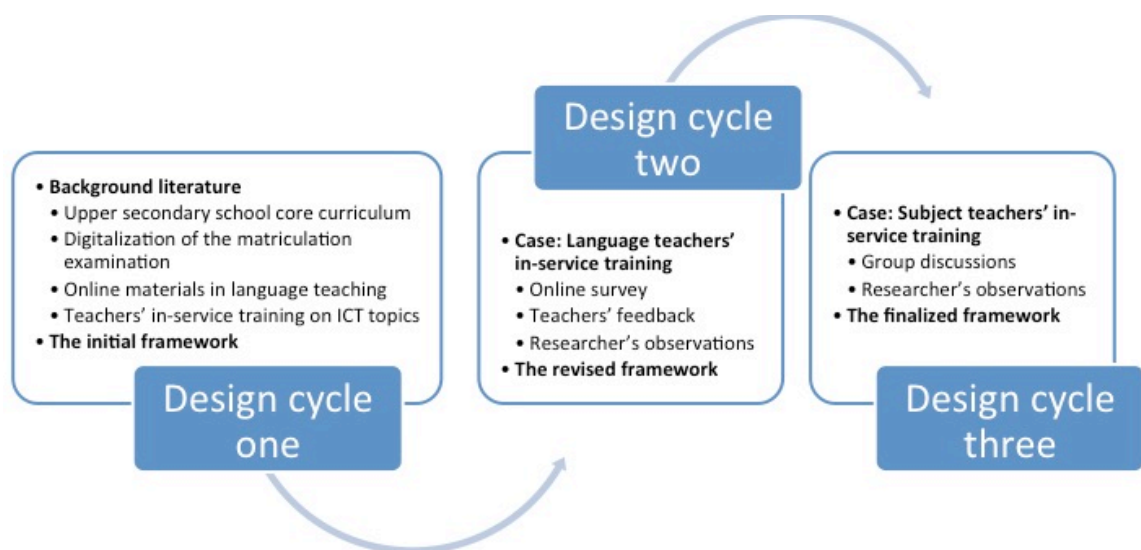
Figure 1. The research process

The following subchapters introduce case study as a research method, online survey as a tool for gathering data, and qualitative content analysis as a method for analyzing data. The final subchapter reviews different points of view concerning trustworthiness.

4.1 Case study

The general goal of any case study is to describe or explain a phenomenon (Hirsjärvi, Remes & Sajavaara 2014, 123; Laine, Bamberg & Jokinen 2007, 31; Yin 2014, 4) and to make the case understandable (Laine et al. 2007, 31). Yin (2014, 16-17) explains that the phenomenon needs to be contemporary and set in a real-world context. Simons (2009) further defines a case study as

> *"[…] an in-depth exploration from multiple perspectives of the complexity and uniqueness of a particular project, policy, institution, programme or system in a 'real life' context. It is research-based, inclusive of different methods and is evidence-led. The primary purpose is to generate in-depth understanding of a specific topic (as in a thesis), programme, policy, institution or system to generate knowledge and/or inform policy development, professional practice and civil or community action. (Simons 2009, 21.)*

Usually, the researcher focuses on a certain case or cases which are, in one way or another, related. The data can be gathered, for example, by observing or interviewing. (Hirsjärvi et al. 2014, 123.) A case study can aim to test, widen, or clarify prior theories. On the other hand, the focus can also be on creating new theories based on new phenomena. (Laine et al. 2007, 19.) It is important to pay attention to how the case or cases are chosen so that the study, on the one hand, focuses on the elements emphasized by the research questions and, on the other hand, makes generalization easier. When two or more cases are studied at the same time, the cases should be chosen so that the cases are either similar or represent extremities. (Yin 2014, 39-53.)

When choosing a case or cases, the researcher also needs to bear in mind that the case must produce enough data and, then again, the data must be such that it can be used to answer the research questions (Yin 2014, 28). Yin (2014, 63) further suggests that more than one case should be preferred over just a single case. Multiple-case studies are not that vulnerable to changes, and it is more probable that generalizations can be made.

In a case study, a phenomenon is examined from the point of view of the research questions (Laine et al. 2007, 26; Yin 2014, 9) which should be formulated into 'how' and 'why' questions (Simons 2009, 13-14; Yin 2014, 9). These types of questions aim at finding answers which can be used to describe phenomena (Yin 2014, 9-10). The researcher needs to consider the methods which best chart the phenomenon and bring answers to the research questions. A case study can be described as a cycle in which the research questions, researcher's prior knowledge, different methods, and the data triangulate. (Laine et al. 2007, 26.)

As case studies are organized in real-world settings, it is possible to use observation as a method for gathering data. Observations can be used to gather additional information about the topic to be studied. They can be conducted formally, for example, by creating a separate tool for collecting observations or the observations may be collected simultaneously while collecting other data. The researcher can be a participating observer who takes part in the actions being studied or a passive observer who focuses only on observations. (Yin

2014, 113-115.) Further, it is important for the researcher to make field notes while observing and thus increase study reliability (Yin 2014, 125).

Case studies often produce both quantitative and qualitative data. Central is, however, that only one or a very limited amount of cases are studied. (Laine et al. 2007, 11.) The goal is to increase understanding of the case at hand and the conditions surrounding the case so that it is possible to explain the case in detail (Laine et al. 2007, 10).

In a case study, generalizing the results can be challenging, as the data produced through a case study is often such that it describes a typical case but in real life there is no such thing as an average case (Laine et al. 2007, 12). Still, the results of a case study can be generalized either to a wider context or into the case at hand. Generalizing to a wider context describes the case as an example of other similar cases and gives information of the research subject of which the case is an example. Generalization into the case at hand refers to the great scale of the phenomenon to be researched and the necessity to focus on particular points of view of the phenomenon. (Laine et al. 2007, 27.)

Case studies have been criticized for not being thorough enough. There is need for systematic approaches. (Yin 2014, 19.) Furthermore, generalization is challenging. A single case or a few cases may appear too tenuous. Thus, the focus should perhaps be more on generalizing theoretical concepts with the help of a case or cases. (Yin 2014, 20.) Case studies also produce much data which leads to extensive reports. A case study which has not been planned properly can also give a distorted picture of the phenomenon. (Simons 2009, 14.) The researcher's subjectivity is also a potential limitation of case studies but it is also inevitable and a part of the process when the researcher aims at understanding the phenomenon. It is also important to note that timing and conditions of the study influence the results. (Simons 2009, 15.)

4.2 Online survey

An online survey is a practical way of finding out what kind of things people do and what they think, feel, experience and believe. The data can be used to describe, compare, and explain phenomena, and as the participants all answer the same questions the results are

structured and compare well. On the other hand, the data received through a survey may remain superficial, the participants may not take answering as seriously as they should, and the questions and answer alternatives may not be practical from the point of view of the participants, or of getting data which promotes the goals of the thesis. Additionally, the subject which the survey handles may be unfamiliar to the participants, and there may be too few answers to the survey in general to make any conclusions based on the answers. (Hirsjärvi et al. 2014, 193, 195.)

Survey questions need to be prepared exactly and they should be evaluated based on the targets set for the thesis. The questions may be multiple choice, open-ended, or, for example, different types of scales. (Hirsjärvi et al. 2014, 198–199.) Open-ended questions give the participant more freedom when answering whereas multiple choice questions restrict answering to alternatives chosen by the researcher. Answers to open-ended questions are more challenging to interpret but they also show what is important to the participants and what kind of things or points of view they emphasize (Hirsjärvi et al. 2014, 201). The more general questions which chart, for example, the participants' background such as gender or age, and which are easy to answer should be placed at the beginning of the survey and the questions which require more precise thinking should be at the end. (Hirsjärvi et al. 2014, 201.)

4.3   Qualitative content analysis

Qualitative content analysis can be used in all qualitative research which includes textual data (Hirsjärvi et al. 2014, 93). It is a systematic and consistent way of analysis (Schreier 2013, 5) which focuses on organizing text data so that new information and meaning can be attained from it (Schreier 2013, 1; Tuomi & Sarajärvi 2006, 105). Qualitative content analysis aims at describing the phenomenon under research in a condensed way without losing any important information of the data (Hirsjärvi et al. 2014, 110). The analysis is executed by classifying the data into manageable categories and by producing conclusions after the thorough analysis (Schreier 2013, 3).

In qualitative content analysis the researcher goes through the data from the point of view of the research questions and aims to answer them (Schreier 2013, 7–8). Qualitative content analysis can produce different results from the same data depending on how the research questions have been compiled. Thus, it is important to describe the context of the research. (Schreier 2013, 28.) The interpretations made of certain data depend on the context but also on the researcher's point of view (Schreier 2013, 31, 34).

The researcher creates a coding frame where the main categories are formed with the research questions as the starting point. The subcategories of the coding frame can be formed by going through the data in a data-driven way, or in a concept-driven way by using prior research as the basis for the categories, or both (Schreier 2013, 60; Tuomi & Sarajärvi 2009, 108–113).

The coding frame should comprise all data, each subcategory should include only one point of view of the data, and each subcategory should be used at least once (Schreier 2013, 73–77). Elo et al. (2014) propose that the selection of categories should be done so that there are not too many concepts and no overlap between categories but that the categories still cover the data properly, and the results are reported systematically and logically.

When proceeding with qualitative content analysis, the data is segmented so that the separate units fit the subcategories of the coding frame. The segments can consist of, for example, entire answers, sentences, phrases, or separate words. Formal criteria such as punctuation or thematic criteria such as changing the topic or theme can be used as a basis for dividing the data. (Elo et al. 2014; Schreier 2013, 129, 134–136.)

4.4   Trustworthiness

Reliability refers to the repeatability of the research procedure and validity to the research method being able to measure what it is meant to measure (Hirsjärvi et al. 2014, 230). In qualitative research, reliability and validity can be reached by describing the research procedure in detail at all stages of the research. In addition to this, the research results and the reasoning behind the different choices and interpretations should be explained as precisely as possible. (Hirsjärvi et al. 2014, 232.) When interpreting the results, the reasons for cer-

tain interpretations can be exemplified by including direct quotes from the research data (Hirsjärvi et al. 2014, 233). Validity can be increased also by using different methods. This is called triangulation. Triangulation can also refer to several researchers working together either when gathering the data, or analyzing and interpreting it. (Hirsjärvi et al. 2014, 234.)

In addition to reliability and validity, qualitative research should also be examined from the point of view of credibility, transferability, dependability, and confirmability (Lincoln & Cuba 1985). Credibility refers to the perspective of the participants in the research. It needs to be evaluated whether the participants consider the results credible. Transferability means the possibilities of generalizing the results to other contexts outside the research setting. Thus, the research context needs to be described in detail. Dependability describes the research process from the point of view of how much the research results depend on the context. Finally, confirmability is used to evaluate whether similar results could be achieved also by other researchers. (Guba 1981; Lincoln & Guba 1985)

Reliability of qualitative content analysis can be evaluated, for example, by considering whether the coding frame can be used for the data consistently and the data is interpreted systematically (Schreier 2013, 191). Also the transferability, credibility, and conformability of the results influence the reliability of qualitative content analysis. To achieve these reliability criteria the research subjects need to be described in detail, the data needs to be collected in such a way and in such conditions that it is as stabile as possible, and the results need to be presented so that they are understandable by different people. It should also be possible to generalize the findings in some extent to other groups of people or different types of settings. For example, quotations can be used to show connections between data and results and make the analysis process more transparent. (Elo et al. 2014; Tuomi & Sarajärvi 2009, 134–149.)

The data collection method needs to be appropriate so that credibility of qualitative content analysis can be guaranteed. In addition to this, the data collection method and the research questions need to work together. The researcher must pay attention to not steering the participants' answers too much. Additionally, the sample must be appropriate and comprise participants who best represent or have knowledge of the research topic. (Elo et al. 2014.)

5 Design cycle one: the initial framework for utilizing online materials in language teaching

The need to support Finnish upper secondary school teachers as the matriculation examinations are being digitalized is the impulse for this thesis. Online materials are not used systematically in language teaching although they play an important role in the upper secondary school core curriculum (see chapter 3.1) and are in a central role in the digitalized matriculation examination tasks (see chapter 3.2). Thus a thorough framework composed of the particulars of the Finnish educational setting, and Finnish and international research on the benefits and challenges related to using online materials in teaching (see chapter 3.3) as its guidelines can encourage and support language teachers in their work. The central findings which make up the initial version of the framework have been highlighted by emboldening them in the text in this chapter.

5.1 Background literature

The first design cycle of the framework was approached by exploring the upper secondary school core curriculum and the guidelines for the digitalization of the matriculation examination in Finland. The matriculation examination was also reviewed from the point of view of high stakes tests. This was followed by mapping previous research on the utilization of online materials in language teaching and the benefits and challenges related to online materials. Research articles on in-service training in ICT-topics were also charted.

Google Scholar[3] was the main tool used for searching peer reviewed research articles and books related to the topic at hand. Keyword queries such as '"online materials" AND language AND teaching/learning', '"online materials" AND education', '"new media" AND language AND teaching', 'pedagogy AND language AND teaching/learning', '"authentic materials"/authenticity AND language AND teaching/learning', 'technology AND language AND teaching/learning', '"high stakes tests" AND curriculum', 'teacher AND "in-service training"', and '"teacher professional development"' were used to sort research

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[3] https://scholar.google.fi

articles and books by relevance. The queries were further sorted by time of publication so that current and relevant research articles could be reached. Thus, research articles and books published after the year 2010, or if the query results remained scarce, published after the year 2000 were used when compiling the theoretical background and the initial version of the framework for utilizing online materials in language teaching.

When going through the upper secondary school core curriculum, the guidelines for the digitalization of the matriculation examination, and Finnish and international research on the utilization of online materials, it became clear that the role of the Internet in today's society is extreme and it is surprising that its role in Finnish schools is so small. The tendency is, however, towards a more digital school especially in upper secondary schools where the new core curriculum sees digital skills essential (see chapter 3.1) and the digitalization of the matriculation examination has started (see chapter 3.2). It is important that schools do not stay isolated when compared to the general societal development which seems to head towards even more digitalized content and procedures.

Before anything else, it is important to emphasize that technology, digitalization, and online materials are not the answer in themselves, and it is important to consider the pedagogical aspects before taking up any new methods or materials into teaching (Kubler 2010; Laurillard 2002; Luukka et al. 2008; Pihkala-Posti 2012b). From teachers' point of view this can also be seen as a somewhat softer landing to the world of digitalization and online materials. When teachers are allowed to use their existing subject specific skills to evaluate what kind of approaches would benefit their students and review online materials from the point of view of their particular teaching subjects they will most likely notice how much online materials have to offer and how many new opportunities for improving their teaching and their students' learning online materials bring.

The core curriculum and the matriculation examination as a high stakes test (see chapter 3.2.2) influence teachers' choices. From the point of view of digitalization this can be evaluated desirable as there seems to be a strong need for guidelines on how to proceed with new methods and ways of working (Au 2007; Boardman & Woodruff 2004; Luxia 2005). It may be sad but true that many teachers tend to stick to old habits and see new

innovations too conservatively. Thus the core curriculum and the renewing matriculation examination force teachers to try out new methods. As both the core curriculum and the digitalization of the matriculation examination accentuate digital skills, varied materials, and possibilities for multiple forms of media as teaching material, teachers have a strong basis to support the utilization of online materials.

The background literature listed several central benefits for using online materials (see chapter 3.3). From a student's perspective, online materials which motivate students in their learning and are meaningful to them increase student commitment to learning (Berardo 2006; Gilmore 2007; Thomas 2014). Authentic and current online materials emphasize life long learning skills as real life materials are used in teaching. These types of materials give students actual tools which they can use when approaching studies later on in life or in situations outside school. Illustrative, exemplifying, diverse, enlivening, and easy to use online materials support the students in the learning situation and make learning more approachable as students can exploit different approaches to materials and themes (see, for example, Berardo 2006; Freda 2005; Kern 2014; Kubler 2010; Pihkala-Posti 2012b). Online materials also promote differentiation and make students' learning more individual. All the benefits of online materials mentioned above promote the student-centered approach to teaching and learning.

When these benefits are viewed from teachers' point of view the popularity of online materials should be evident. Who would not want their students to enjoy all these benefits which online materials can bring to their learning? Teachers do adopt new methods more easily when clear benefits to student learning are at sight (Boardman & Woodruff 2004). In addition to this, students who are motivated to learn and see learning meaningful and supported in many ways are also extremely pleasant to work with in the classroom. Thus online materials could be seen to influence the overall atmosphere at schools.

The challenges related to online materials (see chapter 3.3) can also be examined from both students' and teachers' point of view. Undoubtedly, the greatest challenge found was the unreliability of technology in many different forms (Kubler 2010; Oksanen & Koskinen 2012). This is a rather alarming challenge which the teachers and students cannot

as such influence and take care of merely on their own. It is clear that municipalities and decision-makers are central in providing schools with the necessary funds to acquire functioning equipment. On the other hand, this is also a great opportunity for teachers to let go of their traditional mindset as omniscient super humans and to encourage students to make good use of their technical skills and experience as fluent users of, for example, mobile technology. Another point of view to be considered is that more and more practice and practical examples from schools around Finland are needed so that functional courses of action can be created to different schools.

The challenges related to technology are also visible when contemplating the challenges which teachers' and students' skills related to technology pose to the utilization of online materials (Oksanen & Koskinen 2012). As such, this challenge can be approached, on the one hand, from the point of view of providing teachers with as much in-service training as possible and, on the other hand, making good use of students as digital natives who can easily adopt new technological applications and software because they have grown in the era of digital technology. This as such should be exploited even more.

The amount and, on the other hand, quality of online materials are fascinating challenges which can be combined with the challenge of time (Gilmore 2007; Kubler 2010; Shin 2015; Thomas 2014). The Internet is as such immeasurable and the possibilities are limitless. This may in its own right scare teachers who whish to attain pedagogically sound teaching materials. There is quite simply too much and too poor material available. Searching for materials online takes time and frays teachers. At the same time, the amount and quality of materials can also be viewed from the perspective of quite simply not finding any material at all. This issue can be approached, for example, by evaluating the value of different types of networks which are handy ways of distributing information, materials, experiences, and examples. By utilizing, for example, Facebook and its different content and subject specific groups, a teacher can find countless new online materials daily. The discussions with other teachers extend the walls of teachers' lounges and promote developing the usage of online materials also pedagogically.

Students may feel that online materials are something that belongs to their free time and school should focus on textbooks and other traditional means of passing on information (Gilmore 2007; Liu & Kleinsasser 2015; Oksanen & Koskinen 2012; Thomas 2014). This may affect their motivation and as such complicate the learning process. This is clearly something that only time and exposure will cure. Teachers need to show their students that online materials are a viable addition and even alternative to textbooks, and they can be used to promote learning. Of course, this requires that teachers have adopted a positive attitude towards online materials which also takes time but with sufficient amounts of exposure and urging and the digitalization of the matriculation examination proceeding we may see some surprising changes in the future.

Several core elements related to the central role of online materials in teaching in general and language teaching in particular recurred in the background literature. Previous research shows the significant benefits which online materials have in language teaching, the challenges related to using online materials in language teaching can all be tackled in one way or another, the upper secondary school core curriculum emphasizes skills which can be supported by online materials, and the digitalization of the matriculation examination shows a clear need for online materials. The framework for utilizing online materials in language teaching can be framed from this basis.

5.2 The initial framework for utilizing online materials in language teaching

As discussed in the previous sub-chapter, the background literature provided a strong basis for planning a framework for utilizing online materials in language teaching. When creating the initial framework, the aim was to accentuate the key elements found in the background literature which were seen to comprise the core elements related to utilizing online materials in language teaching.

The initial framework (Figure 4) consists of the foundation which has three core elements; pedagogy, the core curriculum, and the digitalization of the matriculation examination. The

benefits and the challenges related to online materials form two circles. The benefits are highlighted and the challenges are defeated with practical solutions.
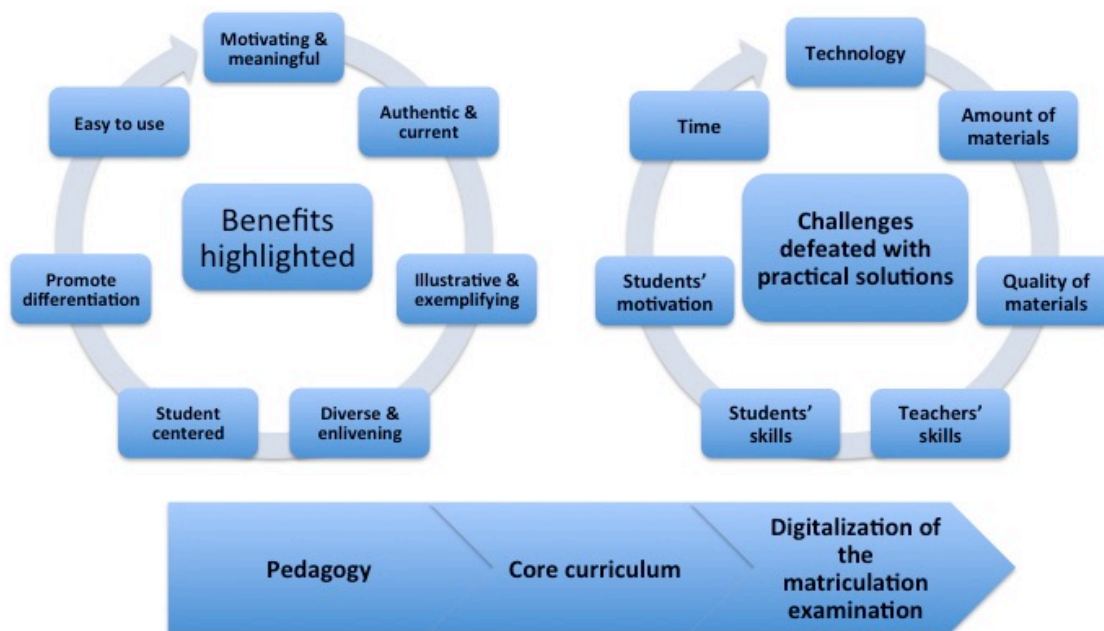

Figure 2. Initial framework for utilizing online materials in language teaching

The result of the first design cycle was the initial framework for utilizing online materials in language teaching which was based on background literature. Especially the pedagogical issues, the core curriculum and the digitalization of the matriculation examination were seen central in the framework. The benefits which were mentioned in the background literature were gathered to the first circle and the challenges to the other circle. It was also considered important to emphasize that the benefits should be highlighted as much as possible and the practical solutions which can be found to defeat the challenges should be made visible.

The next phase of the research process was to create a case study where language teachers' thoughts on the utilization of online materials in language teaching are gathered through an online survey and then test the framework in a live in-service training session where teach-

ers' thoughts, comments and reactions could be observed and recorded. These findings of the case study could then be used to develop the framework further.

6 Design cycle two: Language teachers' in-service training

This chapter presents the general setting of the case language teachers' in-service training, and explains the preparations of the online survey and the in-service training session. Further, answers to the online survey, and the teachers' feedback and researcher's observations during the in-service training session are analyzed. The end of this chapter introduces the revised version of the framework for utilizing online materials in language teaching based on this case study.

6.1 Defining the case: Language teachers' in-service training

The aim of the second design cycle was to develop the initial framework for utilizing online materials in language teaching further by gathering Finnish upper secondary school teachers' thoughts concerning online materials in language teaching. This was done by planning a case study which consisted of an online survey and an in-service training session aimed for language teachers.

The online survey was used to chart language teachers' views on online materials and the online survey answers in conjunction with the initial framework created in the first design cycle were used when planning the in-service training session. In the in-service training session, language teachers were introduced to different points of view related to utilizing online materials in language teaching. The data gathered through the online survey and during the in-service training session in the form of teachers' feedback and researcher's observations was used when creating the revised version of the initial framework.

6.2 Drawing up the online survey

The online survey for the second design cycle was planned bearing in mind the research questions of the thesis (see chapter 2.2) and the criteria presented for surveys as a method of gathering data (see chapter 4.2). The questions of the survey were planned so that they would chart teachers' current practices in the classroom, reveal their thoughts on the usage of online materials, and exemplify the benefits and challenges related to online materials.

The online survey (Appendix A) was created using Google Forms[4] and the questions were written in Finnish. Language teachers, who had registered for the in-service training session on online materials to be organized in January 2016, were informed of the online survey first in the beginning of November 2015 and again in the end of November 2015 by including a link to the survey in an info e-mail concerning the in-service training session. The teachers were able to answer the survey anonymously and it was not obligatory to answer the survey in order to take part in the in-service training session. The teachers were informed that their answers would be used as a basis when the in-service training session, which they were going to attend in a few months, was created.

The online survey had three themes: 'Teaching at the moment', 'Usage of online materials at the moment', and 'Benefits and challenges of online materials'. Under the first theme, the teachers were asked to answer two open questions; which languages they teach, and describe a typical lesson in terms of equipment, materials and methods used. The answers to the first questions were considered important because they outlined the need of online material examples for the in-service training session. The goal was to provide material for all of the languages which were mentioned under the first question. The second question charting teachers' current classroom practices was considered a starting point for the teachers' development as users of online materials. Charting current practices was also thought to reflect the current form of the matriculation examinations.

The second theme consisted of a yes-no-question of whether the teachers had utilized online materials in language teaching and an open-ended question where they were asked to write down examples of online materials which they had used in listening comprehension, reading comprehension, vocabulary and grammar, or written production practice. These questions were thought to reflect the general frequency of online material usage in upper secondary school language teaching related to the different language skills, and also to give examples of online materials which have proven functional in practice and could be used as example materials in the in-service training session.

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[4] https://www.google.com/forms/about/

Under the fourth theme the teachers were asked to answer a yes-no-question of whether they see online materials beneficial in language teaching, and two open-ended questions in which they were asked to list benefits and challenges related to using online materials in language teaching. These questions were thought to give insights into teachers' attitudes toward online materials, and reveal concrete issues which they thought promoted or hindered online material usage in the upper secondary school language classroom.

6.3 The online survey answers

In total 32 teachers answered the online survey in November and December 2015. A qualitative approach of content analysis (see subchapter 4.5) was adopted for the analysis of the answers.

First, the data was browsed through in order to make sure that the data could actually be used to answer the research questions. As it became clear that the research questions could be answered, general browsing was followed by preliminary grouping and classification.

The online survey answers were grouped so that, first, all the answers to particular questions were brought together and then clearly recurrent themes were grouped in order to form manageable categories so that the research questions could be answered. Words which were repeated in several answers were used as cues for finding categories. For example, the word 'autenttinen' (authentic) was repeated as such in 13 answers. Some categories were formed of words or phrases which clearly referred to the same points of view. For example, when the answers included words or phrases such as 'mahdollistavat eriyttämisen ja omatahtisen työskentelyn tunnilla paremmin' (make differentiation and working in one's own pace during lessons easier), 'erityttävää (sic) materiaalia eritasoisille opiskelijoille löytyy rajattomasti' (the amount of differentiating material for students at different levels of learning is limitless), or 'opiskelijat voivat myös valita erityisesti itselle sopivia työskentelytapoja' (students can also choose ways of working which suit them in particular) the answers were grouped under the category 'promote differentiation'. The categories and how many times each category was mentioned are presented in Appendix B.

The online survey data was grouped under headings formed of the research questions. This was done by copying answers to a separate text file. If one answer included several themes, it was split up into entities and placed under separate headings. An original version of the answers was stored separately so that it was possible to examine also individual teachers' answers in their entirety. After the grouping process, the data was abstracted into theoretical concepts which describe, for example, the benefits and challenges related to online materials in detail.

The different categories were exemplified by using quotes from the data when necessary. This made the analysis more concrete. The research questions targeted the analysis of the data to finding out how online materials can be used to support language teaching and what kind of benefits and challenges are related to using online materials in language teaching. Thus qualitative content analysis was used to group and categorize the data from the perspective of the research questions.

In the following analysis, the teachers' answers will be analyzed under three headings; 'Teaching at the moment', 'Usage of online materials at the moment', and 'Benefits and challenges of online materials'. Especially when dealing with the benefits and challenges related to online materials, the online survey answers are illustrated through direct quotations from the research data. The quotations have been allocated with running numbers and translated into English. The original Finnish quotations can be found in Appendix C in the same numerical order. Each quotation is further identified with the word 'Teacher' and a number indicating the order in which the teachers have answered the online survey.

6.3.1 Teaching at the moment

The teachers who answered the online survey taught the following languages: English, French, Russian, German, Swedish, Italian, Finnish as a native language, and Finnish as a second language. Most of the teachers taught more than one language. Thus, the online survey was rather successful in reaching teachers of different languages. The language combinations of these teachers can be found in Appendix D.

The teachers were asked to describe a typical language lesson and give examples of equipment, materials, and ways of working. These answers form a picture of the situation in the language learning classroom at the moment (Figure 3).
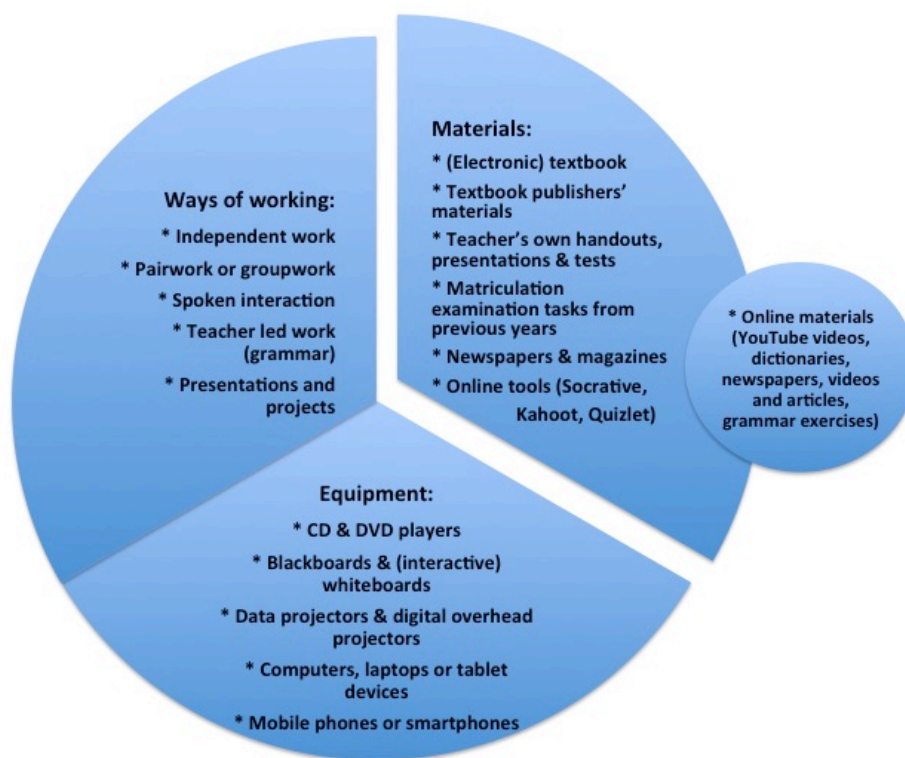

Figure 3. Ways of working, equipment, and materials on a typical language lesson

Individual teachers listed a host of equipment available to them in the average language classroom. This equipment consisted of blackboards, whiteboards, and interactive whiteboards with chalk and markers, data projectors and digital overhead projectors, and CD and DVD players. Many teachers mentioned that during a typical lesson the teacher or the students use a computer, laptop or a tablet device, either their own or one provided by the school, for writing, online searches, recording oral exercises, or making notes. Teachers also mentioned that smartphones were used for online searches or taking part in quick quizzes online. Although many types of equipment was available to many of the teachers, there were also teachers whose classrooms were not that well equipped or who could not

use, for example, students' smartphones or school tablet devices in their teaching as much as they hoped.

The most typical source of material used during a typical language lesson was the textbook. Some teachers used an electronic version of the textbook and some said that also some students used electronic textbooks but this was rather unusual. Still, also a few teachers mentioned that they use the textbook only seldom and other types of materials are more common. Almost all of the teachers who answered that they used a textbook also mentioned that they used the additional materials provided by the textbook publisher, as well. This material was most often online material which consisted of the correct answers to the textbook exercises, recordings of the textbook texts, listening comprehension materials, grammar materials, vocabulary tests, and electronic course tests. Some teachers regretted that there was no ready material for electronic examinations while others had already used these types of materials. Online materials provided by the textbook publishers were said to be easily accessible. Some teachers, however, criticized that these materials did not contain that much variation.

Almost all teachers mentioned some kind of online materials that they use during a typical lesson. The most common online materials were videos from YouTube[5] which were used to start a lesson, lead the students to the theme to be covered, or to encourage the students to start talking or writing about some topic. Online dictionaries were mentioned as a good source of information and online newspapers as a source of current topics. Some teachers mentioned that cultural issues were taught through online videos and articles. Online grammar exercises were given to students who were faster than others.

Teachers also used materials which they had created themselves. These included both handouts on paper and electronic materials such as grammar presentations through Power-Point or electronic tests such as, for example, Socrative[6], Kahoot[7], or Quizlet[8] quizzes, which were used to revise material or as a diversion after a tiresome study period. Some

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[5] https://www.youtube.com
[6] https://www.socrative.com
[7] https://kahoot.it/
[8] https://quizlet.com

teachers also mentioned matriculation examination tasks from previous years which were used to prepare the students for the matriculation examination, and newspapers and magazines as reading comprehension materials.

Student centered approaches were common during the typical lessons, and during almost all the example lessons the students worked together with a partner or in a larger group at least part of the lesson. During the lessons, work was also quite often spoken interaction and the students worked on written assignments at home. Most teachers explained that grammar issues were covered mostly through 'chalk and talk' although one teacher also said that students could choose whether they wished to go through grammar issues with the teacher, with other students, or alone.

Quite often typical lessons included some kind of a theoretical presentation by the teacher and after that independent work, pair work, or group work where students discussed the themes and produced something together. Presentations and tasks which involved online searches and finding information from several sources were also used to some extent but time constraints and students' wishes to use the expensive course book as much as possible limited the amount of these types of tasks.

6.3.2 Usage of online materials at the moment

Most of the teachers (26) had already used online materials in their teaching and only 3 teachers answered that they had not utilized online materials. The examples of online materials can be found in Figure 4. The most often mentioned way to promote listening comprehension was to use YouTube videos. The videos were used either during the lessons, or the teachers linked YouTube videos to the school electronic learning environment and students completed the video listening exercises as homework. Some teachers had created their own questions related to the YouTube videos and the students had to answer the questions, but videos were also used as a basis for, for example, discussion or writing. Other sources of listening comprehension material were, for example, different news sites, weather forecast sites, podcasts, or sites which were directed to students learning the language in question as a foreign language in general.
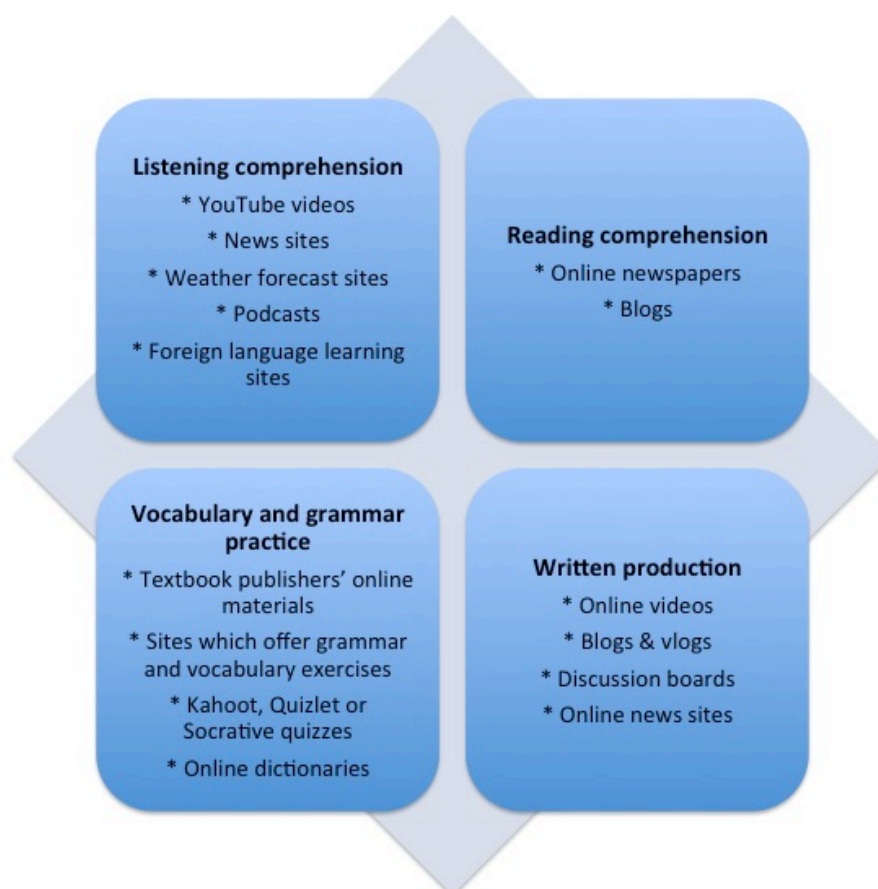
Figure 4. Teachers usage of online materials

Online reading comprehension practice concentrated on different types of texts that could be found online such as articles from online newspapers and blog texts. These materials were used to give the students additional information on different topics or to lead them to a new topic.

Textbook publishers' online materials were the most often used material for vocabulary and grammar practice. Some publishers offered vocabulary tests in addition to practice materials and these tests were used to test students' learning of course vocabulary. Online vocabulary and grammar exercises were used especially for revision before course examinations. Quite many teachers mentioned tests created through Kahoot, Quizlet, and Socrative as a way to help students learn vocabulary and grammar, and test students' skills.

Teachers had used also other online materials which they had found useful and practical for vocabulary and grammar practice. These kinds of materials were quite often used to

differentiate and modify the level of difficulty of the tasks as many sites offered vocabulary and especially grammar exercises which were divided into groups according to difficulty. Some of the teachers also mentioned online dictionaries as additional online tools for supporting vocabulary learning.

The teachers had quite many examples of online materials for written production practice. Their examples of online materials used for written production practice included different types of online videos, blogs and vlogs, discussion boards, and articles from online news sites which were used mostly as introductory materials to different themes and as inspiration before writing.

6.3.3 Benefits related to online materials

When the teachers were asked if they feel that online materials are beneficial in language teaching, 31 teachers answered yes and one teacher answered no. The one teacher who answered no had not used online materials in teaching and thus was not able to pinpoint benefits of online materials to language teaching.

Online materials were described as being more explanatory than, for example, traditional textbooks. In online materials information was often presented in many different ways and text was complemented with, for example, video, images or sound. The possibility to present the same information in different ways was considered a notable benefit of online materials as this was seen to support student learning. From this point of view, online materials were also seen to bring variation to language learning and stimulate and enliven teaching.

1. *"The text can include pictures and sound."* Teacher 26.
2. *"Variety and authenticity to complement the textbook"* Teacher 22.

The teachers commented that online materials made teaching easier and speeded up both the teachers' and the students' work. Online materials were considered easy to modify and students could get hold of the materials easily. Finding information was quick and one could save all kinds of materials and links easily. There was no need to use paper if one did not wish to do so.

3. *"illustrate, enliven, and speed up working"* Teacher 28.
4. *"The flexibility and speed of usage."* Teacher 14.

An important benefit of online materials, mentioned by the teachers, was that it made differentiation easier. Students could work at their own pace, and spontaneous and self-imposed learning was made easier. Online materials made especially listening comprehension practice at students' own level possible. Online materials enabled working outside the classroom and the school, and students could choose ways of working which suited them best.

5. *"Diversifies teaching and enables individual progress -also the good ones have something to do."* Teacher 23.
6. *"Makes individual progress and different level tasks possible."* Teacher 1.

Several teachers mentioned that online materials were current and one could, for example, combine or complement themes dealt with in the textbooks with current news stories or other points of view or update textbook materials by using materials found online. Online materials were, all in all, found to make teaching and lessons more diverse when compared to using the textbook as the only source of material. Additionally, the materials were easily accessible, they offered more options for teachers to choose from and gave opportunities to approach topics in versatile ways. Especially listening comprehension materials were seen to be rich online.

7. *"Current and easily distributable material."* Teacher 6.
8. *"Topicality – the latest news related to textbook topics."* Teacher 5.

A great benefit of online materials mentioned several times in the online survey was authenticity. The teachers described endless resources of authentic written and audiovisual material online. The language used in the online materials was considered genuine language used in everyday situations. The role of the online materials during the lessons was to bring authenticity to support the sometimes artificial textbook materials. In addition to this, especially for English, but even increasingly for other languages as well, there was a lot of material which was addressed especially for foreign language learners. This material, created quite often by native speakers, was seen as an important tool for students to develop their language skills.

9. *"The amount of authentic and current written and audiovisual material is endless and it is easily accessible"* Teacher 13.

Online materials were seen to be motivating. As students are quite fluent and familiar with online environments, online materials were seen as a natural addition to language learning materials. Teachers pointed out that online materials encourage students to learn the language and different cultural features in a natural environment. Online materials and tasks were seen to be especially motivating for boys who are interested in computers in general and who might find it difficult to learn languages.

10. *"Students' motivation for completing tasks is better."* Teacher 22.

The teachers who answered the online survey found an extensive selection of benefits related to using online materials in language teaching. Teacher 32 and Teacher 15 summarized the benefits of online materials comprehensively:

11. *"Variety, authenticity, when considering English the wealth of material (the teacher's challenge is to find "the grains of gold" from the parade of materials and go through the material) --> the amount of differentiating material for students at different levels is limitless. Also the possibility for distance learning, diversifying ways of working, students can also choose ways of working which suit them especially."* Teacher 32.

12. *"allows students to proceed individually; refreshes the lesson; research is fast; brings variation to practicing grammatical structures; allows listening comprehension practice at student's own level of proficiency"*
Teacher 15.

6.3.4 Challenges related to online materials

The biggest source of challenges related to using online materials mentioned by the teachers was the hardware. They reported not having access to school computer class, school laptops, or tablet devices during language lessons, or that there were not enough or no laptops or tablet devices at all which the students could use during language lessons. In some schools the students had been asked to bring their own devices to school but there were still students who did not have a laptop or some kind of a mobile device to use. Students' equipment was described very versatile. The wireless Internet connections were also poor

in some schools and this caused difficulties. Teachers' own skills related to using equipment and software and students' skills were seen to be a problem, too.

> 13. *"the school IT-services are lousy (the Internet connection does not always work, the computers get stuck, installing necessary software is not allowed...)"* Teacher 11.
> 14. *"Difficulties with the Internet connections at school and other technical problems."* Teacher 5.
> 15. *"Yours truly is the challenge: I do not know how to use all the programs which would be reasonable to use."* Teacher 3.

Some teachers commented on link rot which they considered to be rather annoying related to online materials. Some teachers also thought that the excessive amount of online materials is a problem, and some teachers saw the quality of online materials as a challenge; they could not find enough high quality materials to use. Motivating students to work on online materials was also considered to be a problem by some teachers. For example, getting students to focus on the task at hand and not drift to some social media sites was considered problematic.

> 16. *"the problem is choosing materials and finding suitable materials relatively effortlessly."* Teacher 26.
> 17. *"you need to be critical with the source because anyone can create material -you need to ensure authenticity"* Teacher 13.

Time and money were also mentioned as challenges related to using online materials. Many teachers would have liked to make their own exercises related to different types of online materials but it took too much time. Teachers also commented that it took a lot of time to search for proper material online. This was also because there was too much material to choose from. Using the textbook as much as possible also limited the time available for online materials. Not all materials were free of charge and not all schools had money to buy, for example, useful applications to mobile devices. Some teachers also mentioned that copyright issues and students' security online were problematic when using online materials.

> 18. *"It takes a lot of time and effort for the teacher to search for suitable tasks and materials online. And it takes even more time if you start preparing proper online material yourself! The textbook publishers' online tasks have been too schematic and boring so far. The textbooks have too much material*

to cover and when you have bought it I as a teacher feel that it should be used - thus there is not that much time for anything else." Teacher 5.

The teachers who answered the online survey found rather concrete challenges which complicated their usage of online materials. Teacher 15 summed up most of the challenges:

19. *"The functionality of hardware; inaccuracy of material; excessive supply; it takes time to choose material from the endless supply"* Teacher 15.

6.4   Preparing the language teachers' in-service training session

The online survey answers presented in chapter 6.3 and the initial framework for utilizing online materials in language teaching (see chapter 5.2) were used as a basis for compiling an in-service training session for language teachers. In addition to this, the literature review on teachers' in-service training on ICT topics (see chapter 3.4) provided several noteworthy points of view which were considered when the in-service training session was planned. The trainer/researcher focused especially on emphasizing three points:

1. The teachers' role as models for their students in using online materials in their subject in creative and effective ways.
2. The benefits to student learning which can be achieved by using online materials.
3. Increasing teachers' confidence in their skills by accentuating their content knowledge in their own teaching subjects.

Furthermore, as pedagogical and curricular points of view have been found to convince teachers of the benefits of ICT usage in teaching, they were especially highlighted during the in-service training session. The plan was to encourage teachers to think about how the materials would suit their own teaching. Additionally, concrete examples of online material usage were included both to the material examples and to the trainer/researcher's presentation. This was done especially from the point of view of increasing the teachers' confidence. Finally, special emphasis was placed on dealing with current issues and the latest news from the field.

Before the in-service training session in January 2016, the trainer/researcher prepared a material package on the principles of using online materials in language teaching and gathered example online materials to be introduced during the in-service training session. The

electronic learning environment Peda.net[9] was used as the learning platform for the in-service training sessions in general and therefore the trainer/researcher constructed the material package there. As the teaching language in the in-service training session was Finnish, also the material package was created in Finnish. The screen captures which exemplify the material package in this chapter (Figure 5 and 6) and in chapter 6.4 (Figure 7) have been translated into English by the trainer/researcher. The original screen captures in Finnish can be found in Appendix E.
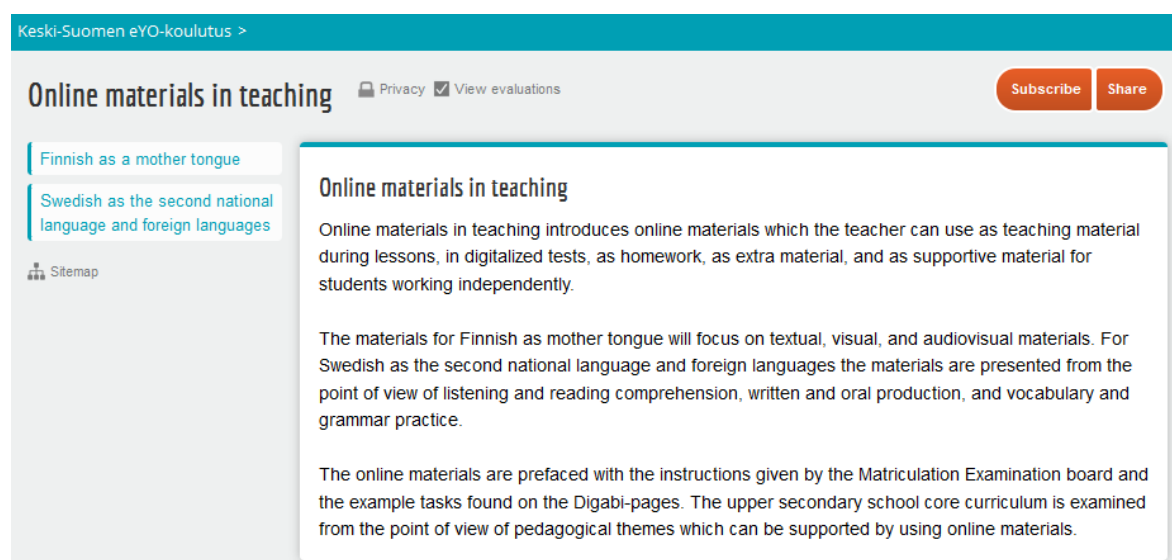
Figure 5. The front page of the material package

The materials were prefaced with the instructions given by the Matriculation Examination board[10], the example tasks provided by the Digabi project[11], and the upper secondary school core curriculum[12]. The background information was examined from the point of view of what kind of materials are used, and what kind of details support the utilization of online materials in teaching. At this point, the first mock examination organized in Finnish as a mother tongue had already been organized and thus it could be used as an example of a digitalized test with different types of online materials in the tasks. The main findings of the online survey were also included in the material package.

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[9] https://peda.net

[10] https://www.ylioppilastutkinto.fi/ylioppilastutkinto/digitaalinen-ylioppilastutkinto

[11] https://digabi.fi/kokeet/esimerkkitehtavat/

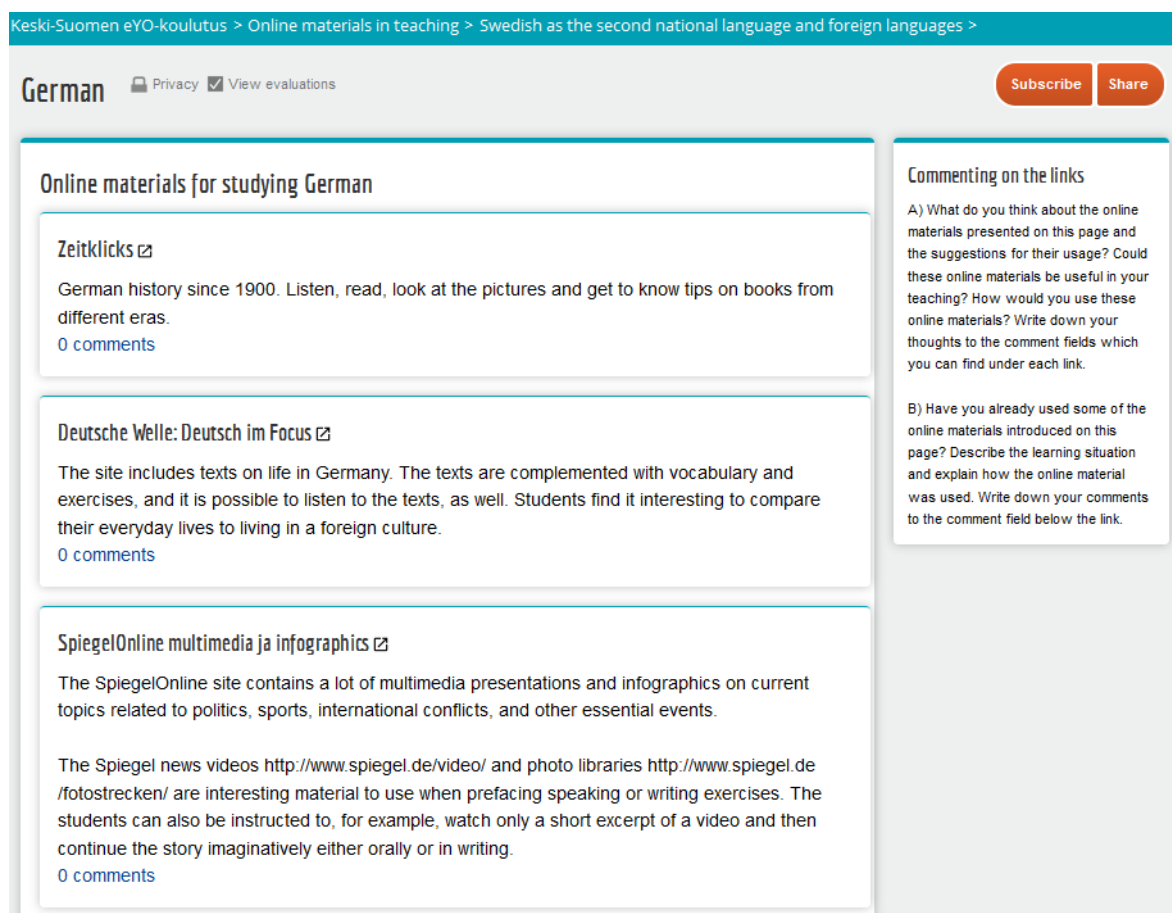[12] http://www.oph.fi/download/172124_lukion_opetussuunnitelman_perusteet_2015.pdf

Figure 6. Online materials for teaching German

The material package was based on the literature covered in design cycle one and the data from the online survey. Several Facebook[13] groups aimed for language teachers turned out to be extremely useful when gathering ideas for the example materials. The trainer/researcher's previous experience as an upper secondary school language teacher was an important part of the design process, when gathering the example materials, and planning how to present the materials in the material package. The material package contained examples of online materials which the teachers could use as teaching material during lessons, as homework, in digitalized tests, as extra material to be given to students, or as supportive material for students who work independently.

The online material examples were linked to the learning environment and each link was complemented with a short description and an example of how the material could be used

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[13] https://www.facebook.com

in teaching. Each of the links contained a comment function and, in addition to this, each page contained two discussion forums where teachers were encouraged to comment on the materials presented on the pages, try out online materials, and describe their own experiences on using them, or link other interesting online materials to the pages.

6.5 Findings of the language teachers' in-service training session

In January 2016, 26 upper secondary school language teachers gathered to the in-service training session in order to learn how to utilize online materials in language teaching. Two of the participants were men and 24 were women. During the two-hour session the trainer/researcher, first, lay the foundations for the topic by introducing the instructions given by the Matriculation Examination Board, the example tasks on the Digabi project site, the upper secondary school core curriculum from the point of view of online materials, and the main findings of the online survey conducted in the first design cycle. After this, different types of online material examples were introduced and the teachers were encouraged to comment on the materials. At the end of the in-service training session, the teachers were further encouraged to give comments on the materials and describe their own experiences on using online materials. The following two subchapters introduce the teachers' feedback and the researcher's observations made during the in-service training session.

6.5.1 Teachers' feedback

The teachers were asked to give feedback on the materials and ideas presented in the in-service training session orally and in writing both during and after the in-service training session. The teachers did not comment on the trainer/researcher's presentation that much spontaneously but when the trainer/researcher asked for comments, for example, from teachers of a particular language or concerning the feasibility of a particular online material they provided answers. The widest comment was from a teacher of German who explained how she had used a video to encourage writing. This lead to discussion about the differences of material and giving students possibilities to choose materials which they find appealing to themselves. Thus the same task could have, for example, text, pictures, and a

video as material and the students could choose which material they use according to their own preferences.

The trainer/researcher's questions were planned to challenge the teachers' original thoughts and encourage them to think about the benefits of online materials in their own teaching and solutions to the challenges they might encounter. The teachers were asked, for example, if they think that statistics is necessary material only for mathematics teachers, how often their students scream of joy when they are introduced to tasks during lessons, could the textbook be left out completely, and if they think that online materials need to be flawless before they can be used in teaching.

The textbook and its dominion as teaching material stirred discussion and the teachers were strongly in favor of using textbooks. The mistakes found in online materials, on the other hand, seemed to be a double-edged question. One teacher stated without any doubts that mistakes are natural and they just need to be dealt with if they are found whereas another teacher thought that the mistakes which are not found and influence students language use may be problematic.

There were altogether five written comments by the teachers. Three comments were about the quality of the example materials. One material had links which did not work properly, another material example had videos whose sound and subtitles were not perfectly synchronized, and a third material example was seen entertaining but not beneficial for language learning. Two comments were teachers' own examples of online materials. One teacher also described an example of an online material orally.

6.5.2 Researcher's observations

The teachers were instructed to comment on the online materials during the in-service training session. The amount of comments might have been larger if they had been given a specific time for commenting, for example, at the end of the in-service training session or at two or three natural points of transition during the session. All the written comments were, however, made during the in-service training session and the teachers did not return to give feedback to the Peda.net learning environment after the in-service training session.

After listening to the recording made of the in-service training session, it became surprisingly clear, how many different types of concrete examples and reasons for utilizing online materials in language teaching the trainer/researcher's presentation actually included and how universal the examples and reasons were in relation to different languages. Thus, it may be that the teachers did not give that much feedback during the in-service training session as they focused on listening to the different types of examples, and the possibilities of applying the examples to their own subject(s) and teaching.

All in all, the teachers seemed to be interested in hearing about the topic. Especially, when some less traditional teaching materials such as a website Preserve articles[14] which contained native speakers' essays collected online, or Visuwords[15], which is a visual dictionary online, were introduced, the teachers were eager to make notes and ask for additional details.

It also became clear that when the trainer/researcher was able to give concrete examples of using the materials in her own teaching, the teachers seemed more convinced that the online materials actually were usable. The teachers wrote down the Internet addresses of many of the sites which were introduced, and they were especially interested in recording the names of the different Facebook groups which were listed as tips for forming networks of language experts, and finding good online materials which other teachers have already tried out in their own teaching.

When the trainer/researcher presented that the textbook could be completely replaced with online materials the teachers were clearly somewhat puzzled and incredulous. When this statement was toned down to online materials complementing the textbook and making the outdated textbook more current with the help of online materials, the teachers clearly relaxed.

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[14] http://www.preservearticles.com/essay-for-high-school-students/
[15] http://visuwords.com

6.6 The revised framework for utilizing online materials in language teaching

The second design cycle was conducted because there was a need to find out what Finnish upper secondary school teachers actually think about using online materials in language teaching and to test the initial framework in a real-world context. Thus a case study containing an online survey and an in-service training session was organized.

The online survey opened a window to the upper secondary school language classroom from the point of view of online materials and provided a wide selection of data and concrete examples of what kind of benefits and challenges online materials pose to the language teaching process. When compared to the benefits and challenges gathered in the first design cycle by analyzing previous research (see chapter 5) the answers were even surprisingly similar.

The in-service training session afforded an opportunity to test the initial framework in a natural setting. The introduction of the in-service training session consisted of the foundation of the framework; the pedagogical issues, the core curriculum, and the digitalization of the matriculation examination. This appeared to be a convincing way to start the in-service training session and it also created a good basis for introducing the different types of online materials, underlining their benefits, and finding answers to possible challenges.

During the in-service training session it became clear that concrete examples of online material usage are needed to encourage teachers to use online materials more in their teaching. If it is possible to explain how some material has been used in a real teaching context, it is more likely that teachers' adopt the material to their own teaching or see online materials more applicable to teaching in general.

The revised framework (Figure 7) consists of the foundation with three core elements, pedagogy, the core curriculum, and the digitalization of the matriculation examination. The benefits and the challenges related to online materials form two circles, the benefits are highlighted and the challenges are defeated with practical solutions. To this point the framework follows the model of the initial framework. What is new in this revised version

of the framework, is the concrete examples block which has been added to create an even more solid foundation to support the utilization of online materials.
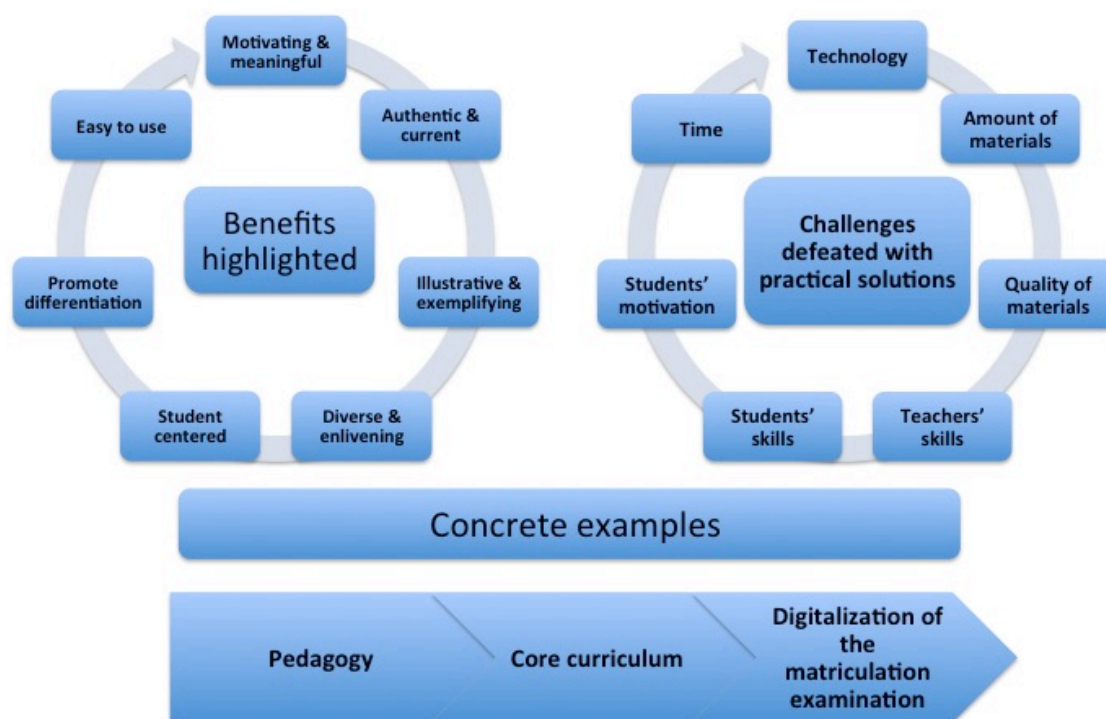

Figure 7. Revised framework for utilizing online materials in language teaching

The second design cycle produced the framework for utilizing online materials in language teaching in a new revised form. After the second design cycle, the question of whether the framework could be applied to other subjects in addition to languages was raised and this led to the third design cycle.

7 Design cycle three: Subject teachers' in-service training

The third design cycle was necessary in order to find further support for the existing framework and to see whether the framework could be applied to other subjects besides languages taught in upper secondary school, as well. Thus, a case study containing an in-service training session for language teachers, mathematics teachers, and sciences and humanities teachers was organized. During this in-service training session, teachers' thoughts in group work sessions and researcher's observations were gathered. This data was used to find further evidence to support the framework created in the two previous design cycles, and to see if the framework would work also more generally in upper secondary school subject teaching.

7.1 Defining the case: Subject teacher's in-service training

The case study in the third design cycle consisted of an in-service training session. In this in-service training session the aim was to examine the framework for utilizing online materials also from the point of view of other subjects taught in upper secondary school. This in-service training session was organized in January 2017. The findings from previous research related to teachers' in-service training on ICT topics (see chapter 3.4) were evaluated again when this second in-service training session was planned. The points of view emphasized during the first in-service training session (see chapter 6) were kept, and two new perspectives were given extra value.

1. Supporting teachers' possibilities of taking part in in-service training was approached from the angle of an online course.
2. As sharing experiences with colleagues is such an important part of in-service training, concrete group work was made a central part of the in-service training session.

To prepare for the third design cycle and the second in-service training session, the in-service training teaching material package was remodeled into an online course. The material package was rebuilt to include more guidance so that teachers could participate in the online course outside the in-service training sessions more easily. The material package

could however still be used as a basis for contact teaching, as well. The platform was still the electronic learning environment Peda.net (Figure 8).

Figure 8. The front page of the material package for languages

The trainer/researcher's lecture on online materials, which was the main part of the in-service training session in the second design cycle, was cut into manageable parts and short screen capture videos, which explained the ideas behind using online materials in teaching, were recorded. A screen recording tool Screencast-O-Matic[16] was used to create the vide-os. These videos were added to the learning environment to support teachers' independent

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[16] https://screencast-o-matic.com

study on the online course. Additionally, a gamified component of questions on the utilization of online materials, the benefits and challenges related to online materials, and questions to encourage thinking about the benefits and solutions to challenges was added to the course.

The in-service training session in January 2017 was aimed for upper secondary school subject teachers in general. Thus the material package needed to be complemented with online materials for mathematics, sciences, and humanities teachers. A separate in-service training session on online materials had been organized for mathematics, sciences and humanities teachers in spring 2016, and these materials were used as a basis for the materials used in this in-service training session. Some current online material links were added and the Matriculation Examination Board links[17] were updated.

For language teachers the basic contents of the in-service training course remained mostly the same as in the second design cycle. The few materials which the teachers had evaluated poor in quality were removed and the materials which they had recommended were added. Also current background materials from the Matriculation Examination Board website were linked to the learning environment.

The materials from the Matriculation Examination Board were somewhat more varied and concrete as the Board had already organized several mock tests in spring 2016 and the first digitalized matriculation examinations had been organized in autumn 2016. The instructions for these examinations and the contents of these examinations were seen important when explaining the role of online materials in the digitalized examinations.

The in-service training session was planned to include two group work sessions. To record the participants' thoughts and output during these group work sessions, the trainer/researcher prepared six Padlet[18] walls before the in-service training session. The walls were used as platforms where the teachers participating in the in-service training session could write down their joint thoughts and where the trainer/researcher could examine their responses also after the in-service training session. There were own walls for language

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[17] https://www.ylioppilastutkinto.fi/ylioppilastutkinto/digitaalinen-ylioppilastutkinto
[18] https://padlet.com

teachers, sciences and humanities teachers, and mathematics teachers in both group work sessions so that their answers could be separated from each other. The Padlet walls were embedded to Peda.net so that the teachers participating in the in-service training session could find everything they needed during the session in one place.

7.2 Findings of the subject teachers' in-service training session

10 upper secondary school teachers took part in the in-service training session in January 2017. Four of the participants were men and six were women. The participants had languages (Finnish as a mother tongue, Swedish as the second national language, English and German), mathematics (both advanced and basic level), or sciences and humanities subjects (history, biology, geography, health education, Evangelical Lutheran religion, psychology, philosophy, chemistry, and physics) as their teaching subjects.

The in-service training session started with the trainer/researcher giving a brief introduction to the concept of online materials through concrete examples of different types of online materials. The upper secondary school core curriculum and quotes from instructions provided by the Matriculation Examination board were used to explain the need for online materials in upper secondary school teaching. A notable difference when compared to the in-service training session carried out in the second design cycle was that the researcher was able to refer to more precise instructions given by the Matriculation Examination Board, and to the digitalized matriculation examinations organized in autumn 2016. In the second design cycle there were only rough outlines of what the digitalized examinations could be like and even the mock examinations had not been organized at that point. Thus the basis for utilizing online materials in design cycle three was more concrete.

After the introduction the teachers were instructed to work in groups, first, to evaluate the digitalized matriculation examinations organized in autumn 2016 from the point of view of online materials and, second, to get to know the online material examples presented on the in-service training material package, and then plan their own learning situation which contained some online material. The teachers wrote down their joint thoughts on the Padlet walls and explained their thoughts to other groups at the end of both group work sessions.

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The trainer/researcher observed the teachers' discussions and also took part in them at points.

7.2.1 Group discussions

The central aim in the in-service training session was to allow teachers to exchange opinions on the digitalized matriculation examinations, the materials used in the examination tasks, and the different types of online material examples in the in-service training material package. Teachers' thoughts and ideas were gathered to find out whether teachers of different subjects see online materials similarly and whether the framework created in the first design cycle and revised in the second design cycle could be applied to the teaching of also other subjects than languages in upper secondary school. A collection of the themes covered in the second in-service training session can be found in Appendix F.

During the first group work session the teachers were allowed to choose groups freely, and then explore the digitalized matriculation examinations (German, basic or advanced level, geography, and philosophy) which had been organized in autumn 2016. The teachers were instructed to pay attention to the different types of materials used in the examination tasks, the sources of the materials, the benefits and challenges related to these types of materials from both the teachers' and students' points of view, and the skills tested with these types of materials. The teachers worked in four groups and wrote down their observations on Padlet walls. The trainer/researcher circled in the groups, aided the teachers in technical issues, and took part in their discussions. Another trainer was also present in the in-service training session but he focused more on technical help related to, for example, the Internet connection or finding the correct page when getting started. The other trainer did, however, also follow the discussions in the groups and pay attention to what was said so that he could support the trainer/researcher in making conclusions about the in-service training session.

After working in groups for about half an hour each group introduced their thoughts to the other groups. The teachers found the following types of materials used in the matriculation examination tasks: videos, statistics, maps, aerial photographs, YouTube videos, text, a

music video, song lyrics, and an excerpt of a movie. They listed the following sources for the materials: online magazines, a non-fiction book, YouTube, and the Matriculation Examination Board.

The teachers thought that the large amount of materials to choose from was both a benefit and a challenge. On the one hand, this was seen to lead to increasing students' media literacy, and the different types of materials were also seen to give the students possibilities to choose materials which they find interesting and easily comprehensible. On the other hand, the amount of material was also seen as a challenge which leaves a somewhat ragbag feeling. The teachers pondered whether the different types of materials included in the tasks were included there just because it was now possible to do it or because they were absolutely necessary in the tasks. The students also need to choose the tasks and materials relatively quickly in the actual matriculation examination situation so that they have enough time to go through the material. The materials were said to test students' abilities to apply their knowledge, find the essential details, and challenge them to logical thinking and reasoning.

Before the second group work session the teachers were instructed to form new subject specific groups so that language teachers, mathematics teachers, and sciences and humanities subject teachers would work in their own groups and go through online material examples intended for their teaching subjects. Two teachers had to leave the in-service training session at this point, and the teachers formed three groups, one for mathematics teachers, one for sciences and humanities subjects teachers, and one for language teachers. There was additionally one Finnish as a native language teacher who wished to work independently.

In these new groups the teachers were instructed to examine the online material examples, think about the benefits and challenges related to the use of these materials in teaching, and compare these materials to textbooks. They were also asked to plan a teaching session where at least one online material would be used as teaching material. They were asked to think about the target group, the learning goals, and the online material to be used, the working methods to be used, and challenges related to this teaching situation. Also during

this group work session the teachers wrote down their thoughts on Padlet walls, and the trainer/researcher circled in the groups and took part in discussions. After about forty-five minutes, the groups introduced their findings and the teaching sessions to the other groups.

The language teachers found new online materials which they had not used in their teaching before. They mentioned, for example, the BBC One Minute World News[19] and the PlayPhrase.me[20] site as something they could use at the beginning of a lesson to lead the students to a particular subject. The trainer/researcher explained how she had used this type of material for listening, speaking, and vocabulary practice, and the teachers commented that this type of material could really be used in multiple ways. The language teachers also mentioned that they had used the Svenska nu[21] site which contained varied material and ready made exercises.

During the group discussions the language teachers criticized online materials which had been created especially for language learning. They said that often these kinds of materials were factitious and even unnatural in their efforts to be funny. They compared, for example, Grammatikbolaget[22] and the Finlandssvenska bloggare[23] site and said that students notice the material being unnatural and prefer the more genuine ones.

When going through the blog examples the language teachers also commented on the topics covered in the blogs. They evaluated that a blog dealing with pregnancy and toddlers would not be interesting or current to upper secondary school students. When the trainer/researcher noted that this topic could be explored with, for example, the health education teacher, the teachers admitted that this might in fact be a way to combine different subjects and start cooperation between teachers.

The language teachers planned a teaching situation around the site Saksaa uusin silmin[24] which provides short videos for German listening comprehension practice. In this teaching

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[19] http://www.bbc.com/news/10462520
[20] http://playphrase.me/en/search
[21] http://svenskanu.fi
[22] https://urskola.se/Produkter/186947-Grammatikbolaget-Sarskrivning
[23] http://www.finlandssvenskabloggare.com
[24] http://yle.fi/aihe/oppiminen/saksaa-uusin-silmin

situation the videos could be watched first without subtitles and then with subtitles, and the students could answer the premade questions. The students could practice listening through these videos also as homework.

The Finnish as a mother tongue teacher focused on the Voitto commercial competition[25] which he found especially practical for teaching. The materials were described current and meaningful to the students, and also fun and entertaining. They could be used in many ways to test students' skills. They were short but still contained much to analyze. The teacher evaluated, all in all, the moving picture superior to textbooks.

The Finnish as a mother tongue teacher planned a teaching session where students used materials introduced in the Finnish as a mother tongue mock examination to practice writing. There were seven different materials to choose from and the students were encouraged to define the point of view for their writing themselves. This task was planned to challenge the students to practice using several material sources as a basis for a text.

The sciences and humanities teachers found the online material examples interesting and varied. They thought the materials contained useful additional information and they thought these kinds of materials could add to students' motivation.

The sciences and humanities teachers emphasized that students need to know the basics of topics before they can be introduced to more applied materials online. Thus they thought that the textbook, which is clear and presents information so that it supports learning, needs to be the main material used for teaching especially on the first basic courses. Online materials can be used for extending students' knowledge on different topics, and when students' skills develop and they proceed to more advanced courses, online materials can be used more.

When the trainer/researcher suggested that the students could search for online materials related to different topics, the sciences and humanities teachers said that it was the teacher's task to find high quality online materials, introduce them to the students, and in this way give the students examples of reliable materials. The trainer/researcher noted that ma-

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[25] http://www.voittokilpailu.fi

terials found by students could perhaps lead to deeper discussions of reliability of online materials and information online. After this, one of the teachers noted that teacher's examples of high quality materials may even stay unnoticed by the students, and by allowing students to search for materials, discussions on their reliability might indeed be more fruitful.

When going through the example materials the sciences and humanities teachers noticed several online materials which they had used in teaching different subjects. These similarities led them into planning a teaching situation which could take place in any of the three subjects they taught (health education, biology, psychology). They used animations on the Päihdelinkki[26] site to demonstrate phenomena and evoke discussion on the effects of intoxicants on sports performance. During this teaching situation, the students could be asked to evaluate the reasons for using intoxicants, and the means used in educating on the health risks related to intoxicants.

The mathematics teachers liked especially the mathematics encyclopedia[27] which they thought was beneficial to both teachers and students. They considered different types of video materials beneficial to students who work independently and saw videos useful also when revising different topics. They commented that videos can also be watched many times and the difficult points can be repeated and this makes them attractive teaching material. As these mathematics teachers also taught physics and chemistry, they mentioned especially different types of physics and chemistry experiments which could be watched on video and the attained results could be compared to actual experiments conducted in class. They saw that comparisons of experiment circumstances and variables supported student understanding and learning.

The mathematics teachers emphasized that Geogebra[28] makes it easy to demonstrate different mathematical phenomena, but they pondered whether ready made Geogebra applications lead to students playing with them instead of actually using the applications to understand phenomena at hand. They pondered whether creating Geogebra applications on the

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[26] http://www.paihdelinkki.fi
[27] http://matta.hut.fi/matta2/isom/html/index.html
[28] https://www.geogebra.org

spot was actually the best way to learn. The mathematics teachers also thought that different types of extra links are more suitable for independent work and revision, and not to be used during lessons. The mathematics teachers did not have time to plan a teaching situation as they talked about the possibilities of realizing the digitalized mathematics examinations in the first place.

7.2.2 Researcher's observations

The language teachers focused even surprisingly much on online materials which they had used already and the new materials were mostly seen as diversions or funny ways to start a lesson. The language teachers also seemed to prefer materials which had ready made tasks. This is rather understandable as they are often pressured for time. The language teachers were also perhaps still a bit timid about using online materials and needed concrete support in adopting them into their teaching. Only one of the language teachers had experience of the digitalized matriculation examination as one student had taken part in the basic level German examination. It was interesting to notice that the teachers had not discussed the digitalized examination experience that much with each other before the in-service training session and the in-service training session gave them the possibility to compare their thoughts.

The sciences and humanities teachers had clearly used online materials in their teaching more and they were also quite well informed about the requirements of the digitalized matriculation examinations. The teachers thought that online materials complement the textbook and work as additional material to illustrate and diversify students' learning experiences. Thus the students' point of view and advancing their learning with the help of online materials was clear.

The mathematics teachers' view on online materials was different compared to the other teachers because the digitalization of the mathematics matriculation examination is still quite far in the future and the actual technical execution of the examination is still incomplete. The mathematics teachers did, however, see online materials as additional material

to aid revision and independent study but not that much as material to be used during lessons.

7.3 The finalized framework for utilizing online materials

During the third design cycle, the framework for utilizing online materials in language teaching was tested in a case study which included an in-service training session for upper secondary school language teachers, mathematics teachers, and sciences and humanities teachers. The aim was to find out whether the framework could also be applied to other subjects besides languages.

The group discussions and researcher's observations during the third design cycle showed that online materials can be utilized also in other subjects besides languages but that sciences and humanities subjects and mathematics approach online materials somewhat differently. Sciences and humanities subjects benefit from online materials which can be used to illustrate and diversify students' learning experiences, and mathematics can make use of audiovisual online material in independent work and revision. **Sciences and humanities teachers and mathematics teachers also emphasize similar points of view, as do language teachers, when they consider the benefits and challenges related to utilizing online materials.**

During the third design cycle the findings of the first and second design cycles were confirmed even further. The foundation for utilizing online materials is formed of the pedagogical decisions, the core curriculum and the digitalization of the matriculation examination. Concrete examples can be used to both emphasize the benefits and tackle the challenges related to online materials. **Teachers' experimental mindset and supporting students' needs were added to the framework based on the group discussions and researcher's observations.** These themes were dealt with already in the first design cycle but they were not included in the initial version at that point. **The group discussions and researcher's observations made it clear that teachers' experimental mindset is extremely important in utilizing online materials.** The attitude which teachers have towards trying out new things, challenging the traditional setting in the classroom, and al-

lowing students to take an active role in their learning and producing learning materials in the form of online material examples is important. **Additionally, supporting students' needs gives more importance to the benefits of online materials and thus needed to be added to the framework** (Figure 9).
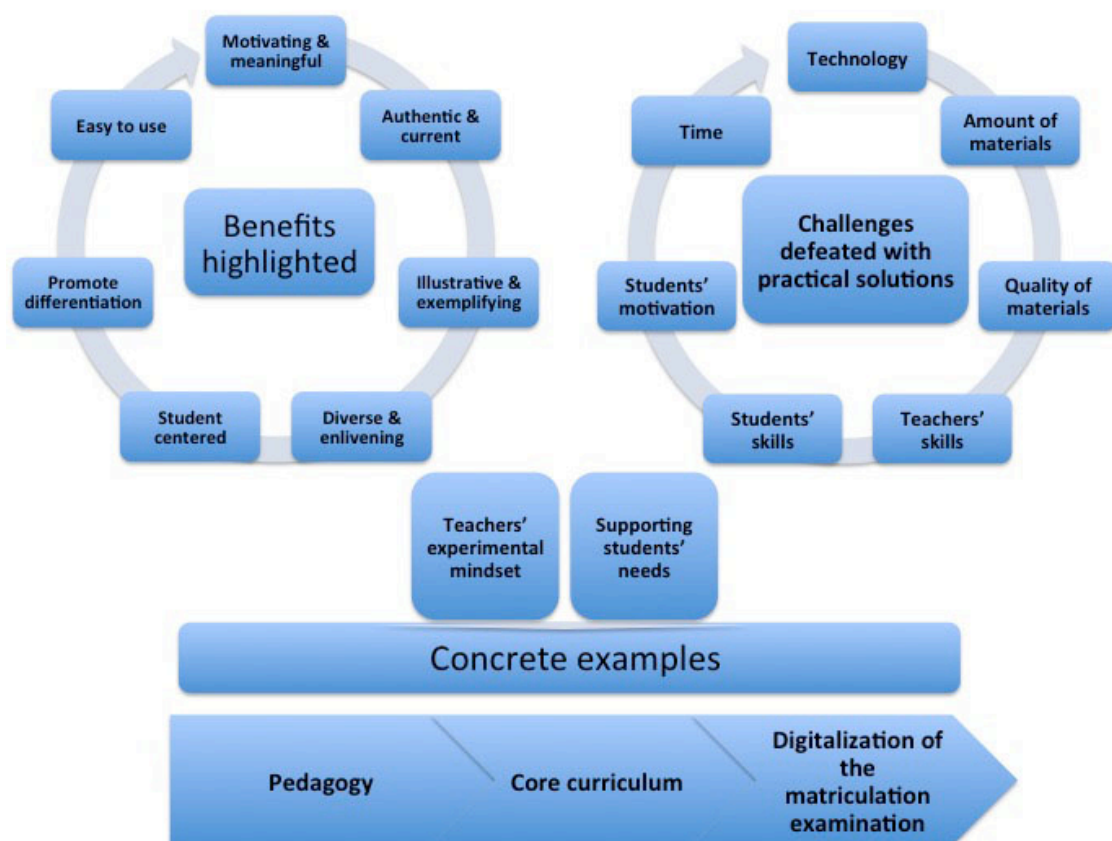

Figure 9. Finalized framework for utilizing online materials in language teaching

8 Discussion, summary and conclusion

The main aim of this master's thesis was to find out how online materials can be used to support language teaching in Finnish upper secondary schools. Another aim was to chart concrete benefits and challenges related to using online materials in language teaching. These aims were formulated into research questions at the beginning of the research process. The data gathered during the research process were used in the different cycles to design a framework for utilizing online materials in language teaching.

8.1   Answers to the research questions

The first research question sought answers to how online materials can be used to support language teaching. The research revealed that online materials support language teaching from several angles. The possibilities for teachers to diversify their teaching and provide more variable materials are endless. The ways to support the students in their learning through illustrative, exemplifying, diverse and enlivening online materials give teachers excellent tools to make their teaching more efficient and more student centered.

The core curriculum underlines differentiation, self-imposed learning, practice at students' own level, and developing students' multiliteracy and exposing them to diverse texts which relate to their everyday lives as key elements of language learning (see chapter 3.1). Thus, the possibilities offered by online materials in supporting these vital elements of contemporary and student centered learning should not be underestimated. Upper secondary school teachers and students are further challenged with the digitalization of the matriculation examination. The changes to the materials and tasks used in this high stakes test have been noticed to correspond to online materials significantly (see chapter 3.2). Thus, it is rather clear that utilizing online materials in teaching is a practical and reasonable approach when developing language teaching to measure up to the new requirements.

The second research question focused on the benefits of online materials in language teaching. The theoretical problem analysis (see chapter 3.3.2) and the online survey conducted in the second design cycle of the study (see chapter 6.3.3) produced a wide array of

benefits related to online materials. Online materials were said to be explanatory, varying, stimulating, enlivening, current, authentic, and motivating. These are all features which increase students' commitment to learning as they acknowledge the students as individuals with distinctive needs and learning goals. What more, online materials also promote life long learning skills as real life materials are used in teaching. Online materials also support differentiation and make students' learning more individual. Student centeredness is an essential feature which can, all in all, be used to describe online materials.

From a teacher's point of view, online materials make teaching more rewarding. Teachers do prefer new methods and materials which clearly benefit their students in one way or another. Thus, making students' learning more individualized and enabling students to enjoy motivating and meaningful teaching does encourage teachers to utilize online materials. The benefits also show a clear endeavor towards current and diverse language learning materials. Both authenticity and motivation related to online materials support the notion that teachers have a strong need to provide their students with materials that give the students possibilities to connect with native speakers of the target language and include materials which the students find interesting and close to their own life.

The third research question focused on the challenges related to online materials in language teaching. The challenges were dealt with especially in the theory section (see chapter 3.3.3) and the online survey (see chapter 6.3.4). Undoubtedly the most notable challenge teachers face when utilizing online materials in their teaching is difficulties related to hardware. This is a notable issue which often cannot be solved by the teacher alone, as the hardware related challenges are such which the language teachers do not necessarily have the skills to tackle at all. Still, many of the challenges are such which an experimental mindset, courage to try out new things without the fear of failure, and boldness to ask the students for help could solve. The great possibilities that lie in the pockets of students in the form of smartphones are limitless. Thus the teachers should embrace the potential they have to offer and all this at the cost of losing their face as the omniscient teacher. If the teacher has the didactic and subject knowledge related to the language in question why not give the students the possibility to show off with their technological skills.

Teachers do need more in-service training in different types of ICT topics and many types of in-service training options should be made available (see chapter 3.4). Offering courses where attendance is compulsory does not necessarily suit teachers' busy schedules and possibilities to attend courses in remote sessions or in some topics even as online courses should be offered. At the same time, teachers' confidence in their own skills and courage to try out new methods without the fear of failure should be supported.

Other challenges such as the amount and quality of online materials and the lack of time are linked to the immeasurable and unlimited nature of the Internet. Important is that teachers, first, get enough practice in making online searches and, second, utilize online networks which provide much help in the form of concrete example materials and pedagogical discussions.

Pedagogy is central also when formulating effective search terms as this is related to the pedagogical idea which the teacher has. Thus, the teacher is required to determine what the students are supposed to learn, in order to succeed in searching for suitable online materials. Finding online materials which suit exactly the teacher's view on how a particular theme should be dealt with can truly be time-consuming and even impossible to achieve. Still, the possibilities of how to approach different themes are countless and, for example, by varying one's point of view or the keywords used in online searches a teacher can find a myriad of materials to be used. Additionally, approaching the online materials from the students' point of view and allowing them to draw up questions related to online videos or texts is just as efficient language learning practice if not even more efficient that the teacher spending countless hours preparing questions for the students. Thus the difficulties related to using online materials in language learning could be tackled with approaching the difficulties from the student-centered point of view that was used when listing the benefits of online materials. In addition to this, the myth of flawless teaching material needs to be replaced with the importance of providing the students with materials which prepare them for the real world outside school. Online materials can do this, as the real world around us is by no means perfect and immaculate.

Online materials should be brought to the language classroom even more as they are such an important part of today's society. Both teachers' and students' attitudes toward online materials develop when more and more workable examples are presented and they get experience of teaching, learning, and testing situations where online materials are used. All in all, challenges need to be solved in order for teachers to utilize online materials more in their teaching and allow the benefits to grow to their full potential.

8.2   Trustworthiness of the present research

This research process was approached from a design-based research perspective in three cycles (see chapter 2). The iterative nature of the design process made it possible to evaluate the research process from different perspectives. Multiple methods of data collection were used in the different cycles to increase credibility. Online survey (see chapter 6.2), feedback (see chapter 6.5.1), group discussions (see chapter7.2.1) and observations (see chapters 6.5.2 and 7.2.2) were the methods used for data collection. In comparison, the data analysis during the different cycles produced rather similar results and similar themes stood out.

The reliability and validity of the current research (see chapter 4.4) can be evaluated, first, from the point of view of whether the research procedure can be repeated and, second, whether the research method measures what it is meant to measure. The research procedures in the different cycles have been explained in detail and if some other researcher wanted to repeat this research procedure it would be possible. Still, it needs to be noted that getting exactly the same participating teachers and creating exactly similar in-service training sessions would be rather difficult. The online survey can be found in Appendix A and thus repeating the online survey in its original form is possible. Still, it is not possible to get exactly the same teachers to answer the online survey.

The research process can also be evaluated by examining credibility, transferability, dependability, and confirmability (see chapter 4.4). It would be interesting to find out if the researcher has actually been able to convey the participating teachers' thoughts and opinions accurately. This has been the unconditional goal but still the researcher's subjective

analysis can produce results which are over interpreted, contain conclusions which may not be true, or which are embellished by the researcher's background as an upper secondary school language teacher.

The framework created during the first and the second design cycle was in fact generalized to another context in the third design cycle when also other subject teachers besides language teachers had the possibility to explore the framework and share their thoughts. Thus, the criteria of transferability was achieved rather well. The context of this study was rather restricted as the participants needed to be upper secondary school teachers and the setting was limited to in-service training. It cannot be said that the teachers participating in the in-service training sessions were all interested in the topic because some of them might have been forced to participate by the principal or they had come to the in-service training session because some other teacher was taking part in the session, too. Thus, the participants were most probably rather varied. In addition to this, the in-service training sessions organized during this study were rather different in their form. The first one consisted of mostly lecture and the second one focused on group work. Thus, as the results already from the first cycle and the background literature review produced similar results as the online survey and the in-service training sessions, it can be said that the context did not influence the results of the study notably.

This study is a thorough example of following design-based research methodology (see chapter 2). Both theory and practice have been acknowledged during the research process, and the design and testing has resulted in a framework which forwards upper secondary school teachers' work and opens new possibilities for supporting students' learning. For example, Kelly (2004) has criticized design-based research for being weak in generalizations of the research results. In this study, generalization was taken into account already during the cycles as the third design cycle examined the framework in a slightly different context.

The role of the researcher in design-based studies is rather challenging. It is important to take into account, on the one hand, the researcher's background and, on the other hand, the researcher's central role in the research situation. When considering this study, the re-

searcher's background promotes understanding of the research subject but may also constrict the interpretations made. Furthermore, as the researcher is also the trainer in the in-service training sessions, it is possible to take a more active role in the research situation. Still, it has been extremely important that the researcher has tried to remain as neutral as possible in the research situation.

The online survey was designed especially from the point of view of the research questions and thus the data received responded the needs of the thesis very well (see chapter 6.2). The online survey answers were saved digitally. The data was first read through to get a general impression of what kind of issues were mentioned. After this the data was organized into themes according to the guidelines set by the research questions. All in all, the data was examined several times in order to create clear examples (see chapter 6.3). Triangulation became evident as the feedback, group discussions, and observations were used to find support to the original themes found when analyzing the online survey data. The data analysis was also compared to the findings made from the background literature. Direct quotes were used whenever possible to exemplify the data.

The teachers who answered the online survey were mostly rather interested in utilizing online materials and had also done so already, whereas only three teachers answered that they had not utilized online materials in their teaching. This might be interpreted so that the answers to the online survey would be too positive and not chart the true situation in Finnish upper secondary schools. Still, those teachers who had utilized online materials in their teaching and had a positive attitude towards online materials could also itemize several types of challenges related to online materials. Thus, their perspective was diverse and enabled evaluations of online material usage from different points of view.

The trustworthiness of the present study was promoted by recording the first in-service training session so that the researcher could return to the actual in-service situation afterwards. Notes of observations were made directly after the in-service training sessions. After the second in-service training session the trainer/researcher compared her observations with the other trainer who was present in the in-service training session to ensure that the observations which were made were similar.

The in-service training sessions where the framework was tested were both natural in-service training settings and the teachers' feedback and researcher's observations were consequently produced in authentic situations. This, of course, means that it is rather difficult to produce exactly the same conditions if the study would be repeated at some point. Still, the conditions of the in-service training sessions have been described in detail so that repeating the study would be easier and generalizing the results would be possible.

The framework was created by the researcher, first, based on previous research and developed further with the help of the analyzed data in the second and third cycle. In the third cycle, the researcher got help from the second trainer of the in-service training session and they were able to compare the impressions they had got from the teachers' discussions and statements. Still, it is important to consider that the researcher's own assumptions and thoughts in conjunction with the researcher's background as an upper secondary school teacher do play an important role in the analysis of the data and when making conclusions. This has been acknowledged during the research process thoroughly and jumping into conclusions based on own prior knowledge has been fought consciously.

The sample of the study was thoroughly planned. The teachers participating in the study by answering the online survey and taking part in the in-service training sessions were volunteers and taught mainly in upper secondary schools. Still, it is probably so that mostly those teachers who were interested in utilizing online materials and had utilized them already answered the online survey. On the other hand, the teachers answering the online survey were probably rather motivated to answer and provided profound answers as they benefitted from answering the survey. They got a say in developing the in-service training session they were going to participate in.

8.3 Conclusion

Harnessing the Internet into a genuine learning tool is important. Especially language teaching can benefit from the immeasurable amount of online materials available. If the Internet is included in teaching in a pedagogically meaningful way, studying becomes more meaningful and motivating. At the same time, this also means that teachers become

learners who develop their professional skills continuously and aim at life long learning. There is no need to rely on the mere textbook, as online resources are so extensive.

The digitalization of the Finnish matriculation examination can be seen as either a carrot or a stick to increase the utilization of the Internet and online materials in teaching. Teachers can demand textbook publishers to prepare ready-made digital materials or they can take the lead and promote an active role in making good use of freely accessible online materials in teaching. In any case, the general goal of every language teacher should be to develop their students' language skills to respond to the requirements of real life situations, and as students are in different levels, multimedia content and online content is a clear answer to providing them interesting and motivating material.

It is important for teachers to receive in-service training on ICT-topics but even more important is that they learn how to develop themselves professionally by joining professional networks online. The challenges of today's society require that students are taught in current ways. The Finnish school system cannot lag behind but must bravely embrace the future, new methods, and materials. Also teachers' attitude as super humans needs to be shed and teachers need to see the possibilities and bravely try out new things. Teachers are highly qualified in pedagogical issues and know their subjects well. When all this knowledge is combined with the students' skills in the digitalized world, great things can be achieved.

The framework for utilizing online materials in language teaching produced during this study can be used to support Finnish upper secondary school teachers in their work. Although the background literature section covers applicable research from both Finland and abroad, the framework created focuses on the Finnish educational system and aims to provide support to especially Finnish upper secondary school teachers. Thus the point of view is limited and could be developed further into a more international one in the future. As a master's thesis level work this study could have been somewhat smaller scale and focused, for example, as a case study to one in-service training session, or chart teachers' opinions on online materials merely through the online survey. Still, in its current form, the study succeeds in mapping the field of online material usage in language teaching in Finnish upper secondary schools profoundly.

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Appendices

A   The online survey

Verkkoaineistot kieltenopetuksessa

Hei kieltenopettaja,

Tämä kyselylomake on osa pro gradu -työtäni Jyväskylän yliopiston tietotekniikan laitoksella ja se liittyy Keski-Suomen eYo-koulutuksen kieltenopettajille tarjottavaan teemaan 'Verkkoaineistot eri oppiaineiden opetuksessa'.
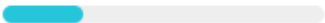
Kyselyn täyttäminen kestää noin 10-15 minuuttia. Vastaukset käsitellään niin, että yksittäistä vastaajaa ei pysty tunnistamaan. Vastauksia käytetään pro gradu-tutkimuksen tekemiseen sekä tammikuussa 2016 kieltenopettajille järjestettävän eYo-koulutustapaamisen pohjana.

Lisätietoja tästä kyselystä sekä pro gradu -työstäni saa lähettämällä sähköpostia osoitteeseen
sisko.minkkinen@opettaja.fi

Kiitos jo etukäteen vastauksistasi!

Sisko Minkkinen
Koulutusteknologian maisteriopiskelija
Tietotekniikan laitos
Jyväskylän yliopisto
sisko.minkkinen@opettaja.fi

| SEURAAVA | | Sivu 1 / 4 |

Älä koskaan lähetä salasanaa Google Formsin kautta.

Verkkoaineistot kieltenopetuksessa

*Pakollinen

Opetus tällä hetkellä

Mitä kieliä opetat? *

Oma vastauksesi

Kuvaile tyypillinen oppituntisi. *

Mitä välineitä, aineistoja ja työskentelytapoja oppitunnillasi käytetään?

Oma vastauksesi

TAKAISIN   SEURAAVA   Sivu 2 / 4

Älä koskaan lähetä salasanaa Google Formsin kautta.

Verkkoaineistot kieltenopetuksessa

*Pakollinen

Verkkoaineistojen käyttö tällä hetkellä

Oletko hyödyntänyt verkkoaineistoja kieltenopetuksessa? *

○ Kyllä

○ Ei

Kerro esimerkkejä verkkoaineistoista, joita olet käyttänyt kuullunymmärtämisen, luetunymmärtämisen, sanaston ja rakenteiden tai kirjallisen tuottamisen harjoittamiseen. *

Oma vastauksesi

TAKAISIN   SEURAAVA   Sivu 3 / 4

Älä koskaan lähetä salasanaa Google Formsin kautta.

Verkkoaineistot kieltenopetuksessa

*Pakollinen

Verkkoaineistojen hyödyt ja haitat

Koetko verkkoaineistoista olevan hyötyä kieltenopetuksessa? *

⭕ Kyllä

⭕ Ei

Millaista hyötyä verkkoaineistoista on kieltenopetuksessa? *

Oma vastauksesi

Millaisia haasteita liittyy verkkoaineistojen hyödyntämiseen kieltenopetuksessa? *

Oma vastauksesi

| TAKAISIN | LATAA | ▰▰▰▰▰▰▰▰▰▰▰ Sivu 4 / 4 |

Älä koskaan lähetä salasanaa Google Formsin kautta.

B   Data from the online survey in the second design cycle (N=32)

Typical lessons
Equipment
- mobile phone/smartphone (8)
- computer/laptop/tablet device (21)
- data projector/digital overhead projector/blackboard/whiteboard/interactive whiteboard (12)
- CD and DVD player (8)
Materials
- textbook (24)
- electronic textbook (6)
- textbook publishers' online materials (14)
- online text/video/digital dictionary/music/grammar exercise (22)
- handout/newspaper/magazine/matriculation examination booklets from previous years (7)
- online tool (Socrative/Kahoot/Quizlet) (5)
Ways of working
- pair/groupwork and spoken interaction (27)
- teacher led work (10)
- presentation/research project (3)

Examples of online materials
Listening comprehension
- YouTube (9)
- news sites (6)
- other online sites with video or audio (8)
Reading comprehension
- online news sites (6)
- blog texts (4)
Vocabulary and grammar practice
- textbook publishers' online materials (9)
- Kahoot/Quizlet/Socrative (6)
- online sites with vocabulary and grammar exercises (8)

Written production practice
- online videos (3)
- blogs/vlogs/discussion boards (1)
- articles from news sites (5)

Benefits related to online materials
- explanatory (2)
- variable (5)
- make teaching easier (8)
- promote differentiation (10)
- current (7)
- diversifying (13)
- authentic (13)
- motivating (8)

Challenges related to online materials
- hardware (21)
- link rot (3)
- amount of materials (7)
- quality of materials (9)
- teachers' skills (5)

- students' skills (4)
- students' motivation (7)
- time (16)
- copyrights (2)
- students' information security (1)
- money (3)

C   The original quotations from the online survey data

1. *" Teksteissä voi käyttää kuvaa ja ääntä."* Teacher 26.

2. *"Monipuolisuutta ja autenttisuutta oppikirjan rinnalle"* Teacher 22.

3. *"havainnollistavat, elävöittävät ja nopeuttavat työskentelyä"* Teacher 28.

4. *"Käyttämisen joustavuus ja nopeus."* Teacher 14.

5. *"Monipuolistaa opetusta ja mahdollistaa helpommin yksilöllisen etenemisen -myös niille hyville riittää tekemistä."* Teacher 23.

6. *"Mahdollistaa yksilöllistä etenemistä ja eritasoisia tehtäviä."* Teacher 1.

7. *"Ajankohtainen helposti jaettava aineisto."* Teacher 6.

8. *"Ajankohtaisuus – uusimmat uutiset oppikirjan aiheisiin."* Teacher 5.

9. *"Autenttista ja ajankohtaista kirjoitettua ja audiovisuaalista materiaalia on loputtomasti ja se on helposti saatavilla"* Teacher 13.

10. *"Opiskelijoiden motivaatio tehtävien tekoon parempi."* Teacher 22.

11. *"Monipuolisuus, autenttisuus, englannin kielen kohdalla materiaalin runsaus (opettajan haasteena löytää "kultajyvät" kaiken materiaalitulvan keskeltä ja käydä aineisto läpi) --> erittyttävää (sic) materiaalia eritasoisille opiskelijoille löytyy rajattomasti. Myös etätyöskentelyn mahdollisuus, monipuolistaa työtapoja, opiskelijat voivat myös valita itselle sopivia työskentelytapoja."* Teacher 32.

12. *"sallii oppilaiden yksilöllisen etenemisen; piristää tuntia; tiedonhaku nopeaa; vaihtelua rakenteiden harjoitteluun; sallii oman tasoisen kuullunymmärtämisharjoittelun"* Teacher 15.

13. *"koulun IT-palveluiden surkeus (netti ei aina toimi, koneet jumittavat, ei saa asentaa tarvittavia ohjelmia…)"* Teacher 11.

14. *"Nettiyhteyksien ongelmat koulussa sekä muut tekniset pulmat."* Teacher 5.

15. *"Meikäläinen on se haaste: en osaa kaikkia ohjelmia, joita olisi järkevää käyttää."* Teacher 3.

16. *"ongelma on valinnan vaikeus ja sopivien löytäminen suht vaivattomasti."* Teacher 26.

17. *"lähteen suhteen pitää olla kriittinen, koska materiaalia voi luoda kuka tahansa - autenttisuus pitää varmistaa"* Teacher 13.

18. *"Vie paljon aikaa ja vaivaa opettajalta hakea sopivia tehtäviä ja materiaaleja netistä. Ja vielä enemmän aikaa vie, jos alkaa itse laatia kunnollista nettimateriaalia! Oppikirjan kustantajien nettitehtävät ovat olleet liian kaavamaisia ja tylsiä tähän mennessä. Oppikirjoissa on liikaa asiaa, ja kun se on ostettu, niin opettajana koen, että sitä pitäisi käyttää - ei jää kauheasti aikaa mihinkään muuhun."* Teacher 5.

19. *"Laitteiston toimivuus; aineiston virheellisyys; liiallinen tarjonta; aikaa menee aineiston valitsemiseen loputtomasta tarjonnasta"* Teacher 15.

D   Combinations of languages taught by the teachers who answered the online survey (N=32)

English (6)
English and French (4)
English, Russian, German, and Swedish (1)
Finnish (5)
Finnish, Finnish as a second language (1)
Italian (1)
Swedish (3)
Swedish and English (3)
Swedish and French (1)
Swedish and German (5)
Swedish, German, and English (1)
Swedish and Russian (1)

E   The original screen captures of the Peda.net material package
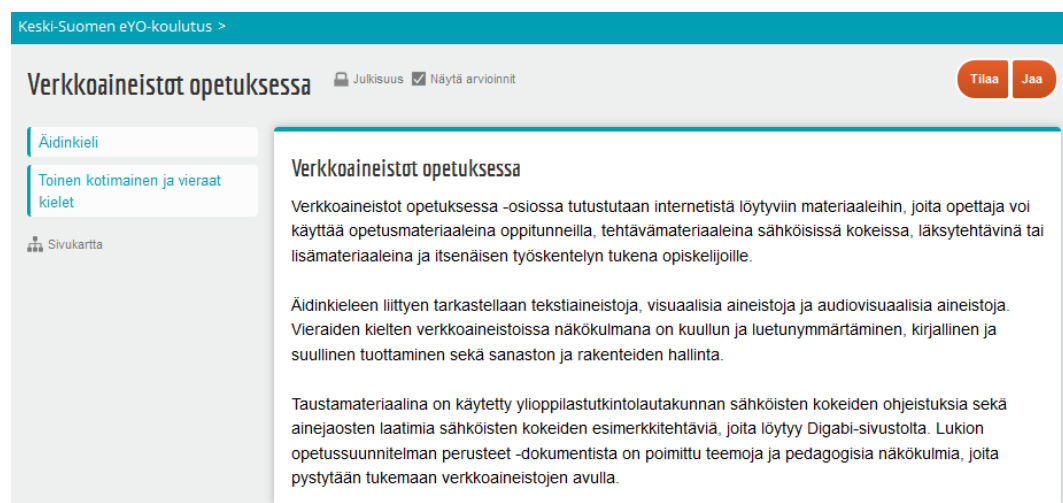
Figure 5. The front page of the material package on Peda.net (See chapter 6.4)
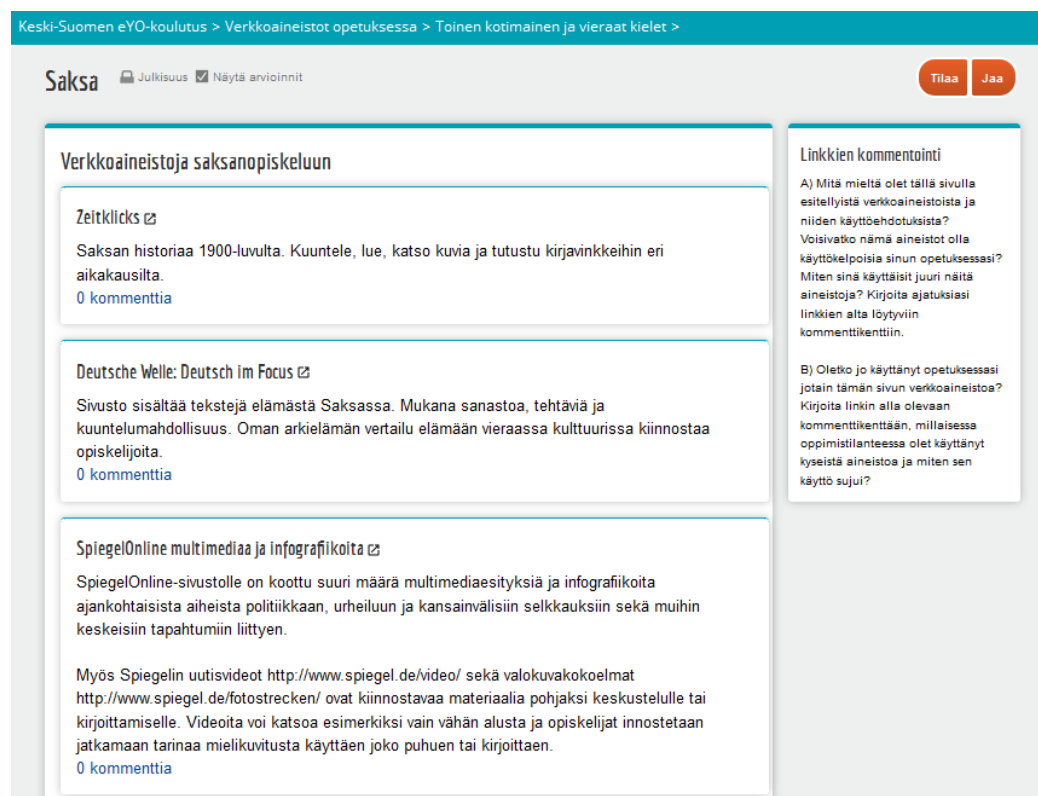
Figure 6. An example view of how the online materials were presented in the material package; online materials for teaching German (See chapter 6.4).

Figure 8. The front page of the material package on Peda.net for languages in the second in-service training session (See chapter 7.1).

F   Data from the Padlet walls in the third design cycle (N=10)

Teachers opinions on the digitalized matriculation examinations
- there is much material which develops students' media literacy
- there might be too much material
- the amount of material leaves a ragbag feeling
- students need to choose the tasks and materials relatively quickly in the test situation
- the tasks test students' abilities to apply their knowledge, find the essential details, and require logical thinking and reasoning

Materials
- videos, statistics, maps, aerial photographs, YouTube videos, text, a music video, song lyrics, an excerpt of a movie

Sources for materials
- online magazines, a non-fiction book, YouTube, the Matriculation Examination Board

Language teachers

Online materials
- can be used to introduce new topics
- prefer ready made exercises
- are current, meaningful to the students, fun and entertaining
- videos are superior to textbooks
- requires functioning technology
- There are notably less challenges than benefits to both the teacher and the students!

Sciences and humanities teachers
Online materials
- seem interesting and varied
- provide useful additional information
- may increase students' motivation
- can be used in teaching different subjects
- can be used to demonstrate phenomena
- evoke discussion

Mathematics teachers
- encyclopedia useful to both teachers and students
- online sites not to be used during lessons
- videos suitable for independent study and revision
- videos can be watched multiple times
- Geogebra good for demonstrations
- ready made Geogebra applications lead to students playing with the applications
- learning is better when Geogebra applications are created on the spot