

IMPLEMENTING E-LEARNING IN FINNISH HIGHER EDUCATION DURING THE COVID- 19 PANDEMIC

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Abstract

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Title of publication Implementing e-learning in Finnish higher education during the Covid-19 pandemic		
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Abstract <p>In response to the Covid-19 outbreak in Finland, higher education institutions were shut down and transferred to remote online learning. While the pandemic has been continuing throughout 2020 and 2021, Finnish higher education students have been practicing e-learning. This is a significant change in the learning environment, especially for on-site degree students.</p> <p>The purpose of this study is to discuss e-learning and related concepts. From there, it forms the theoretical framework to examine how remote online learning has been carried on in Finnish higher education institutions due to the pandemic, especially from students' perspectives. Next, it studies the students' wishes to continue e-learning post Covid-19 crisis.</p> <p>The thesis utilized both qualitative and quantitative approaches. The qualitative method was used more to form the theoretical framework. It was applied to study the subjects of e-learning and e-learning in Finnish higher education. It was done to collect secondary data. The quantitative method was used to collect primary data by a survey. The survey was administered to Finnish higher education students. The collected data was aimed to be generalized.</p> <p>The study unraveled e-learning key points and related concepts such as distance learning, and blended learning. It also provided a general understanding of how e-learning was implemented in Finnish higher education institutions. Regarding the state of e-learning in Finnish higher education in the Covid-19 pandemic, the results suggest that it has been effective and that the difficulties have been minimal. Most of the learning activities have been online, although some amount of contact teaching was still facilitated. Regarding the students' perspectives, they are overall satisfied with their study process. There were divisions in students' preferences over e-learning and in their wishes to continue it. However, many of them have adapted well to online learning, and have been tolerant regardless of the learning delivery modalities.</p>		
Keywords e-learning, online learning, distance learning, blended learning, Finnish higher education, Covid-19		

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1 INTRODUCTION

1.1 Background

The year 2020 started with the global outbreak of coronavirus. In response to the spread of the virus infection, many countries have enforced social distancing practices. Countries in which the infection rate surged have gone into a complete lockdown. Schools have been physically suspended and migrated to a remote curriculum. With the help of technological advancements, e-learning has come to facilitate education in the Covid-19 pandemic. Many digital education measures have been taken into account. Online classes and virtual conferences have started to increase. The number of users of online training platforms, learning forums, and content management systems has escalated.

This study discusses Covid-19 impact on Finnish higher education. It tackles the question of how the Covid-19 pandemic has transferred education to e-learning. From there, it raises thoughts on e-learning as a new trend even out of the crisis.

According to the American Society for Training & Development's (ASTD) E-learning Glossary, e-learning covers a wide set of applications and processes such as web-based learning, computer-based learning, virtual classrooms, and digital collaboration. It includes the delivery of content via the Internet, intranet/extranet (LAN/WAN), audio- and videotape, satellite broadcast, interactive TV, and CD-ROM. (ASTD 2000). As per Mason and Rennie (2006, 32), the term "blended learning" was originally used to describe courses that tried to combine the best of face-to-face and online learning. Blended learning is also referred to as hybrid learning. Meanwhile, distance education is a form of education that brings together the physically distant learner(s) and the facilitator(s) of the learning activity around planned and structured learning experiences via various two- or multi-way mediated media channels (Saykili 2018, 5). Distance learning facilitates the physically remote condition of the education, regardless of the means of delivery. However, in the world of ICT development, distance learning is often done through e-learning.

In Finland, online platforms are used for teaching and learning purposes in higher education institutions (HEIs) including universities and universities of applied

sciences (UASs). Although different forms of distance or blended learning are used, there are no national statistics on the numbers of distance education courses or the numbers of students on these courses (Owusu-Boampong & Holmberg 2015, 7). Open universities and open UASs are the only institutions with evident measures regarding blended learning and other forms of distance learning. Even though Massive Open Online Courses (MOOCs) were introduced in Finnish higher education, their motives and applications are not so widespread. Owusu-Boampong and Holmberg (2015) claimed that there is currently no specific policy in Finland concerning higher education at a distance. This statement is still valid at the time of writing this thesis report.

The novel coronavirus outbreak was declared in January 2020. It was confirmed as a global pandemic by late February. To contain the contagion, many countries have restricted social gatherings. Schooling, thus, has been suspended partially or shut down completely. In Finland, the first case was recorded on 15 February 2020 (Worldometer 2020). After that, the situation quickly escalated and social distancing measures came into effect in mid-March. On the 16th of March 2020, the Finnish government announced nationwide school closure to prevent the spread of coronavirus (EDUFI 2020). This decision was anticipated by all universities and UASs. Finnish higher education was switched from mostly face-to-face to completely distance and online learning. This study follows up the phenomenon with the examination of Finnish higher education students' experiences and perspective of e-learning during Covid-19 and in the near future. To do that, the thesis also discusses e-learning and e-learning higher education.

1.2 Objectives

The goal of this study is to examine e-learning in higher education and e-learning in the Covid-19 pandemic from Finnish higher education students' perspectives. The thesis first discusses e-learning and related concepts such as blended learning and distance learning. It also discusses the general picture of e-learning in Finnish higher education before and during Covid-19. The thesis examines the practices of online learning as the substitution of face-to-face classroom-based learning in Finnish HEIs during the pandemic. Through the study, the researcher

aims to perceive the students' viewpoints regarding online learning approaches being encouraged postcrisis.

As noted, the thesis focuses on studying students' perspectives. Therefore, it will not directly focus on teachers, institution board members, or other parties' opinions. To examine these parties, the thesis collects data mainly from secondary sources. In addition, there are other variables that contribute to the outcome as well. These variables are the used technology and network availability, social and pedagogical aspects of education in general, and how long the pandemic is likely to continue. It is also important to examine online learning before Covid-19. The thesis separates e-learning development into two phases. One is e-learning before Covid-19 as a result of education innovation. The other is e-learning in Covid-19 as a result of schooling disruption.

To meet its goal, the study has the following, more specific objectives:

- Gain insights about e-learning in general and e-learning in higher education
- Collect information such as policies, specific programs, and statistics about how e-learning was used in Finnish higher education before Covid-19
- Research on activities and practices in Finnish HEIs that have been adjusted to cope during the Covid-19 pandemic
- Examine students' attitudes on a paradigm shift towards hybrid method in Finnish higher education

2 RESEARCH METHODOLOGY AND PROCESS

2.1 Research questions

To achieve the goal of the study, the study focuses on the following research questions:

- What is e-learning, blended learning, and distance learning?
- What is the fundamental element of these learning environments?
- What was the state of e-learning in Finnish HEIs before the Covid-19 pandemic?
- How familiar are students in Finnish HEIs with Learning Management Systems and other concepts such as e-learning course providers and conferencing tools?
- What has changed in Finnish HEIs as a result of the Covid-19 pandemic?
- How have Finnish HEIs' academic and student-related activities changed compared to the time before the Covid-19 outbreak?
- What are their points of view on continuing e-learning post Covid-19?

Question one studies the key words of the thesis. Answering the question aims to describe e-learning and related concepts and terminology. Question two examine further the related elements of these three modes of learning. Together, both questions outline a foundation for the rest of the work.

Question three and question four identify the state of e-learning in Finnish HEIs before the pandemic. The state of e-learning in Finnish HEIs is discussed based on the general e-learning policies and students' familiarity with e-learning. The data is collected by a survey and from sources that discuss the policies. The data may differ from institution to institution; thus, a dynamic result is expected.

The fifth question is focused on the point when e-learning activities in Finnish HEIs started to change. The potential answer to this question must show measures taken by the authorities to continue learning activities after the Covid-19 outbreak. By comparing the results of this question to the results of question three about e-learning before Covid-19, a conclusion of how Covid-19 has boosted e-learning could be made.

Question six investigates how learning has been affected by the remote learning situation caused by Covid-19. The possible answer to the question will depict learning activities in the Covid-19 pandemic from students' perspectives. Question seven examines the students' views on e-learning after Covid-19. The research process is conducted through a survey whose respondents are Finnish higher education students.

2.2 Research methods and data sources

Qualitative research is used to form a theoretical framework. In this part of the thesis, the aim is to discuss key concepts and terms such as e-learning, blended learning, distance learning, and learning management systems (LMS). This part of the thesis also discusses e-learning in Finnish higher education and e-learning in Covid-19. A qualitative method is also used to collect secondary data about school closures and the pandemic's impacts on education. This is also meant to provide additional background and context to the study. This part of the thesis is based on research question one, two, three, and five.

The second part of the thesis is based on quantitative. Data is collected both primarily and secondarily. Primary data is gathered with a self-administered survey whose respondents are Finnish higher education students. The respondents are highly approachable and can give diverse insights. However, this study also needs secondary quantitative data from other studies. They can be in the form of surveys or systematic observations that have a wider study population of national authorities or education leaders. This secondary quantitative data potentially answers the questions that the primary data cannot. In general, the quantitative methods in this part focus on the research question four, six, and seven.

2.3 Self-administered survey

The survey is the main research method in the second part of the thesis. The survey is administered to Finnish higher education students. It aims to collect data about the general policies of e-learning in Finnish HEIs before and during the Covid-19 pandemic. It also gathers data about the students' learning activities in Covid-19. In addition, it examines the students' opinions on e-learning post Covid-19.

2.3.1 Priorities and practicalities of the survey

There are certain reasons to prioritize this method in this study. During the Covid-19 pandemic, certain studies have been conducted on the Finnish HEI management levels. These studies do regard how education has been carried on despite the pandemic. However, only a limited number of them examine learning activities in higher education from the students' perspectives (EDUFI 2020; Moitus et al. 2020; Pekkola et al. 2021). Most of them have involved associations, ministries of education, and school boards as the survey populations.

Using such secondary data may jeopardize the external validity of the research. Campbell and Stanley (1966, 197) claimed that external validity asks the question of generalizability: To what populations this effect can be generalized. Steckler and McLeroy (2008, 9) also stated that in external validity, it was important that the study is likely to be effective in other settings and with other populations. This part of the thesis focuses on the students' opinions. It should not refer to opinions made solely by Finnish HEI management levels.

Regarding internal validity, secondary data does not meet the requirements. Internal validity is the level that changes in a dependent variable can be associated with changes in an independent variable (Taylor & Asmundson 2007, 24). It is the level of trustworthiness causal relationship is proved without the presence of other variables. Surveys as a data collecting mechanism are context-specific. Most of the available studies mentioned above (EDUFI 2020; Moitus et al. 2020; Pekkola et al. 2021) have broader education environment contexts from that of the self-administered survey used in this survey. Data from these sources will only be internally valid in those specific research contexts. In this study, the context is narrowed down to Finnish higher education. Therefore, to gather primary data, the most practical data collection method for this study is a self-administered survey.

2.3.2 Survey method and data types

According to Salkind (2010), a primary data source is an original data source, that is, one in which the data are collected firsthand by the researcher for a specific research purpose or project. Secondary data is usually defined in opposition to primary data. The former refers to data collected by someone other than the user, or

in other words, data that have already been collected for some other purpose. (Allen 2017). Thereby, data collected from this research is categorized as primary data. The researcher designs and distributes the survey, as well as collects and analyzes first-hand results.

Regarding the survey method, this survey follows a quantitative method. The term “quantitative” means that there is a numerical scale behind the quantities that respondents provide in the response. This numerical scale can be as simple as expressing a degree of agreement or disagreement over a scale of ordinal intensities (Scarpa 2012, 1). In practice, the survey can be an interview or a questionnaire. While interviews are more likely to be categorized as qualitative, questionnaire-based surveys are done more often in quantitative research study. In addition, a questionnaire is more suitable for small-scale student research studies which often have limited resources to conduct interviews with every one of the research population. Hence, the survey will be done as questionnaire.

The questionnaire collects information about students’ learning process before and during Covid-19, as well as their perspectives on e-learning practicalities. The survey will be designed to test the hypothesis that Covid-19 has significantly impacted the presence of e-learning in Finnish HEIs. The targeted respondents are students of Finnish higher education. The method is quantitative, and data is collected primarily. The questionnaire designing, distributing, and data collecting process will be facilitated by Google Form.

2.3.3 Survey data collecting process

One part of the thesis is based on a survey as a quantitative research method. After the survey topic was defined, the data collecting process was followed. The process consisted of four main steps: sampling, survey design, pilot testing, and distribution. First, the researcher decided on the survey sample size. The survey sample size was decided from the targeted population and by using a sampling technique. Next, the research designed the survey questions based on the sample size and thesis schedule. The first version of the survey was delivered for pilot testing. After that, the survey was reviewed and modified. Only then, the survey was distributed to the respondents. These four steps of data gathering are discussed further in the next four sub-sections.

2.3.3.1 Sampling

Sampling is the process through which a sample is extracted from a population (Alvi 2016, 11). According to Tarhedoost (2016), a population is the entire set of cases from which a research sample is drawn. In this case, all students from all Finnish HEIs form the population. However, since researchers neither have the time nor the resources to analyze the entire population, they apply sampling techniques to reduce the number of cases. (Tarhedoost 2016, 18.) A sampling technique is applied when planning for this research. According to Alvi (2016), based on information obtained from the sample, the inferences are drawn for the population.

There are two types of sampling techniques: probability and non-probability sampling. According to Tarhedoost (2016), probability or random sampling means that every item in the population has an equal chance of being selected in the sample. According to Brown (1947), some reasons to favor random sampling include the fact that it conforms to the theoretical model, it is free from bias, and it tends to represent the universe in all its many characteristics. Non-probability or non-random sampling is often associated with case study research design and qualitative research. Yin (2003) stated that case studies tended to focus on small samples and are intended to examine a real-life phenomenon, not to make statistical inferences in relation to the wider population (Tarhedoost 2016, 22). This survey method is quantitative and aims to make a generalization. For this purpose, non-random sampling is not well-suited because of its limitation in generalization. Probability or random sampling, hence, is selected.

Within probability sampling, there comes simple random sampling, systematic sampling, stratified random sampling, and cluster sampling. Regarding cluster sampling, the method means that the whole population will be divided into clusters or groups, from which a random sample is taken from random clusters (Tarhedoost 2016, 21). David (2016) asserted that sampling was advantageous for those research studies whose subjects are fragmented over large geographical areas as it is less time-consuming (Tarhedoost 2016, 21). Since cluster sampling is usually used when the population is large and undefined of the total number, it matches the survey population's nature. As the numbers of Finnish HEIs can be defined,

the sample can be clustered according to the institution. For all the reasons, the survey proceeded with the cluster sampling technique.

As for how to do cluster sampling, Tarhedoost (2016) defined the steps of implementation to consist of: defining clusters for the population (1), number the clusters (2), and select the cluster by random sampling method (3). Regarding data clustering in this study, students from the same Finnish higher education institution were grouped into the same data cluster. Therefore, the number of clusters is the number of Finnish HEIs. They were listed alphabetically with the one-based indexes. These numbered groups were randomly selected.

Sampling size determination is also a critical aspect of the study. If the study is inferential, sample size can considerably contribute to generalization. However, when conducting a survey, it is more important to obtain a representative sample than a large sample (NOAA Coastal Services Center 2007, 1). Therefore, based on the estimation of time and available connections, a sample size of 70 was decided. The response rate was aimed at 100 percent, with a 95 percent confidence level and a margin of error of 5 percent. To help maximize the response rate, pilot testing was conducted. This will be discussed later in section 2.3.3.3.

2.3.3.2 Survey design

The survey consists of seventeen questions (Appendix 1). All of them are closed-ended in the form of multiple-choice, yes/no, and Likert scales. In addition, two of the questions are not used to filter out respondents that were not in the survey population, not to get results. The primary reason for avoiding open-ended questions in this questionnaire is to assure the numerical scalability of the respondents' answers. The researcher aims to study the degree of agreement and/or disagreement made by respondents towards these options.

Salant & Dillman (1994) asserted that the researcher must avoid questions that ask the respondent for data they could not or do not have. They claimed that both the question and any response options must be clear to both the respondent and the researcher. (Salant & Dillman 1994, 92-98.) To avoid misinterpretations, the questions in this survey are expressed with the least words and in the easiest way to understand. In the more sophisticated questions, the researcher added an example for guidance. If the potential answers for a question are too varied to all be

listed out, there is an additional option, "other". The researcher tried to avoid lengthy wording and jargon as well as provide explanations for abbreviations. Every question is focused on a single aspect. As Glasow (2005, 2-6.) mentioned, survey questions should not be combined where the respondent may wish to answer affirmatively for one part, but negatively for another. Moreover, the survey does not collect any of the respondents' personal details to avoid biased interpretations. Salant and Dillman (1994, 92-98) also emphasized the importance of maintaining the confidentiality of individual responses. The respondents are kept anonymous by using Google Forms with the unchecked "Collect email addresses" setting.

2.3.3.3 Pilot survey

A pilot survey must first be conducted to test both the instrument and the survey procedures before the actual survey is conducted (Levy & Lemeshow 1999, 7). Pilot testing is also a way to reevaluate and adjust the questionnaire's structure. It can serve as a means of quality assurance for grammar, sentence structure, and clarity (NOAA Coastal Services Center 2007, 11). For this survey study, to compensate for the limited sample size, a pilot test was done to ensure a high response rate.

The pilot test should be administered to a small group of individuals who are as similar as possible to those being sampled (NOAA Coastal Services Center 2007, 11). To conduct a pilot test for this survey, the researcher enrolled a group of 10 students from three UASs. They were asked to fill in the survey form and give comments if they find any unclarities in the set of questions. The researcher analyzed the responses' pattern and reviewed the pilots' feedbacks. Later, the survey structure was rearranged. The questions were restructured to the chronological order of before and during the happening of the Covid-19 pandemic. Some questions' descriptions were added or rewritten for better understanding. Other small details were adjusted such as wording, indications of maximum selected options, etc. After the pilot testing and improvements, the survey was distributed to the respondents.

2.3.3.4 Distribution

As the survey is a self-completed questionnaire, it was distributed online in the form of a web survey. This procedure of web survey distribution allows great speed and flexibility for respondents; and requires little-to-no cost and minimal supplies required (NOAA Coastal Services Center 2007, 3). The researcher sent the Google Form survey to connected people on LinkedIn, Facebook, and via email. The survey form had been open for inputs for ten weeks, during which the researcher was actively seeking new participants and sending the form out. The participants took the survey at their own pace without a given due date. Salant and Dillman (1994), while discussing ethical issues in survey, also stated that survey participation is a voluntary event that requires the researcher to encourage participation without undue pressure or coercion of the participants. After ten weeks, the form was closed to responses. The form is not editable once the respondents finish submitting it, to avoid inconsistent data during the analysis phase. Responses during this ten-week time were recorded in Google Form's response pool.

3 E-LEARNING

3.1 E-learning and related concepts

Since its early days, the internet has actively shaped how people live, communicate, work, and relax. As of July 2020, there are almost 4.57 billion active internet users over the world, encompassing 59% of the global population (Clement 2020). From 2016 to the end of 2019, the number of smartphone owners increased from 2.5 to 3.5 billion, accounting for approximately 41.5% of the total population in 2020 (O'Dea 2020). Within 2019, the share of households with a computer at home reached 49.7% worldwide (Alsop 2020). In Finland, by 2017, 93.5% of households have access to computers from home (OECD 2020). The compilation of network technology development, affordability of portable electrical devices, as well as increased computer literacy together contributed to the modern concept of e-learning.

3.1.1 E-learning definition

Marc J. Rosenberg (2000) determines that e-learning refers to the use of internet technologies to deliver a broad array of solutions that enhance knowledge and performance. It is based upon three fundamental criteria:

- It is networked.
- It is delivered to the end-user via a computer using standard internet technology.
- It focused on the broadest view of learning.

Additionally, according to Association for Talent Development's (ASTD) E-learning Glossary, e-learning covers a wide set of applications and processes such as web-based learning, computer-based learning, virtual classrooms, and digital collaboration. It includes the delivery of content via the Internet, intranet/extranet (LAN/WAN), audio- and videotape, satellite broadcast, interactive TV, and CD-ROM. (ASTD 2000).

Both definitions mention the availability of network technology as the first and foremost element to enable e-learning. The first definition does include the networked essence in the fundamentals, which can be understood as communications among

the learners and between the learners and the instructor/teacher on the learning platform. However, the second definition uses a more comprehensive term to express the same meaning - digital collaboration. On top of that, it goes into further details of what applications and processes can be considered as e-learning. It indicates that the term “e-learning” is an umbrella term for learning settings such as web-based learning, computer-based learning, virtual classrooms, and digital collaboration. Besides modern methods, it also includes methods of legacy e-learning such as through CD-ROM and TV broadcast. Meanwhile, the first definition gives a relatively vague idea by saying “deliver a broad array of solutions” and “it focused on the broadest view of learning”. Thereby, even though the two definitions are not conflicted, this study follows more closely to the second one.

3.1.2 E-learning and distance learning

E-learning and distance learning are sometimes used interchangeably, but the two terms do not share the same meaning. Nowadays, e-learning and distance learning often happen at the same time. However, distance learning was the first one to be initiated. E-learning only came to support distance learning further when the Internet had developed. The next two sub-sections delve into the development process of distance learning and the differences between distance learning and e-learning.

3.1.2.1 From distance learning to e-learning

The early trace of distance learning was rooted in behaviorist theory of the 1920s and programmed instruction of the 1960s (Corbeil & Corbeil 2015, 53). Programmed instruction (PI) is a method of presenting new subject matters to students in a graded sequence of controlled steps. Its architecture involves breaking content down into small pieces of information called frames, learners reading the frame and answering a question about the frame, and feedback being collected afterward (EduTech Wiki 2016). With PI, learners were granted the possibility to work through the lessons at their own speed. During or at the end of the course, they will be given assessments to evaluate their comprehension level. As an antecedent paper-based instruction method, PI set the foundation for the future e-learning. Modern e-learning is the networked version of the initial PI.

From 1920 and 1960, multiple indications of flexible and distance learning occurred. Sidney L. Pressey, a Professor of Psychology at Ohio State University, devoted a whole decade from 1920 to 1930 in attempting to automate education. At the end of 1924, in a joint meeting of the American Psychological Association (APA) and the American Association for the Advancement of Science, he introduced the first “automatic intelligence testing machine” in the world. The machine was later developed and renamed “Automatic Teacher”. *The machine lets students drill and test themselves* (Petrina 2004, 311) through multiple-choice method stimuli and responses. However, this first machine was a commercial failure due to its limitations and objective social system shortages.

In 1954, Skinner embarked upon a series of studies designed to improve teaching methods for spelling, math, and other school subjects by using a mechanical device that would surpass the usual classroom experience (Wleklinski 2014). This machine focused on both teaching and testing by presenting learning contents and requiring responses to “fill-in-the-blank” questions simultaneously. The machine was said to be *a labor-saving device because it can bring one programmer into contact with an indefinite number of students* (Skinner 1958). The machine was also claimed to be suitable for *mass production, but the effect upon each student is surprisingly like that of a private tutor* (Skinner 1958). According to Skinner’s article “Teaching Machines” in 1958, with a grant from the Fund for the Advancement of Education, this teaching machine was built, and tests were conducted. Later, self-instruction rooms were set up in Harvard and Radcliffe University to teach their undergraduates. This teaching machine-equipped self-instruction booth setting was regarded as the model for the development of PI in the following years.

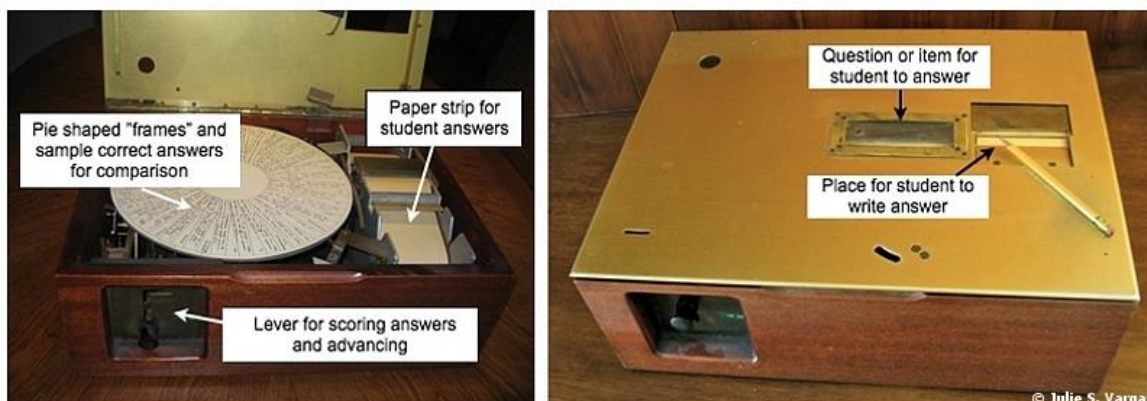


Image 1. B.F. Skinner's Teaching Machine (Vargas 2010)

In 1959, the first computer-based training (CBT) program was introduced. The Programmed Logic for Automated Teaching Operations (PLATO), originally developed at the University of Illinois through the 1950s and 1960s, was one of the first CBT programs. The definition of CBT is close to the definition of individualized training - an interactive learning experience between a learner and a computer in which the computer provides the majority of the stimulus, the learner must respond, and the computer analyzes the response and provides feedback to the learner. However, the early CBT was not a resounding innovation because it was only seen as *little more than programmed instruction teaching machines*. (Clark 2010.) The multimedia capacities were only put into full use in the early 1990s when the Internet came around. Then, CBT programs were able to deliver lessons in audio, graphic, and motion videos in addition to just texts. The program ended in 2006 yet was a huge leap forward in pioneering the use of technology and online communication tools to facilitate education. Learning management system (LMS) in today's e-learning world is believed to derive from this concept of computer-based training programs.

Throughout the 20th century, many higher education institutions were also keen on developing tools and models for distance learning purposes. In the 1960s, instructional designers at University of Wisconsin-Madison built a system that *incorporated a myriad of communication technologies to increase access to off-campus students* (Corbeil & Corbeil 2015, 53). In 1976, the development of a tele-writing or audio-graphic system started at Britain's Open University. Britain's Open University had been primarily focused on distance learning. Prior to this system, they had been delivering course materials and corresponding with tutors and students by mail. (Epignosis LLC n.d, 9-10.) In 1981, the system was named Cyclops system and brought into trial use, targeting students at fifteen Open University study centers. These students used a Cyclops system installed on a trolley to connect with other students and a tutor for remote tutorials. The tutor displayed pre-prepared graphics at each study center which the students could annotate by drawing on the screen with a light pen and discuss. (SchomEmunity Wiki 2020.)

During the 1980s and 1990s, there was significant growth in the number of students studying part-time and through distance learning. There has also been a notable growth in non-traditional learners, beyond the typical 18- and 24-year-old mainstay of university demand. (Williams & Goldberg 2005, 725.) The economic growth increased the education requirement for a wider age range. More people included in the workforce and women returning to work after maternity leave resulted in the essentiality of lifelong training. *Once the exclusive domain of the elite in society, there is now a much broader appreciation of the place and purpose of higher education, and what it affords its recipients and society more broadly in a knowledge-based and globally interconnected economy* (Williams & Goldberg 2005, 725). This contributed to the education paradigm shift as schooling became more and more learner and market-oriented. Education sectors involved learners and stakeholders more in their strategies and operations. Together with the demand for a flexible study pathway that can fit into a working person's schedule, distance delivery of classes began to surge.

Long before the Internet came into picture, a clear motive to facilitate distance learning had been established. However, this "appropriate" delivery trend has accentuated since the turn of the century with the emergence of new forms of distance delivery that draw upon advances in the various information and communication technologies (ICTs). (Williams & Goldberg 2005, 726.)

In the late 20th century, e-learning tools and methods thrived with the introduction of the computer and internet. The first Macintosh personal computer in the 1980s created the possibility to learn at home for many individuals. By the 1990s, several schools were set up to deliver only online learning. (Epignosis LLC n.d, 10.) According to Tamm (2019), 1999 marked the year that the first online university was opened. In 2008, the term MOOC (Massive Open Online Course) were first brought into use (Tamm 2019). Nowadays, MOOC has become a common way of online learning delivery in liberal adult education.

3.1.2.2 Differences between e-learning and distance learning

Despite the closely related development process of e-learning and distance learning, it is essential to differentiate the two concepts. Mason and Rennie (2006, 16)

consider distance learning as a means of engaging with students who are relatively remote (in geography and/or time) from their tutor. Guri-Rosenblit (2005) stated that “distance education”, by its very definition, denoted the physical separation of the learner from the instructor, at least at certain stages of the learning process. E-learning, on the other hand, refers to the use of electronic media for a variety of learning purposes that range from add-on functions in conventional classrooms to full substitution for face-to-face meetings by online encounters. (Guri-Rosenblit 2005, 469-470.) E-learning only indicates learning activities done using electronic devices with network access. Its definition says nothing about the physical location where e-learning operates. In higher education, students often experience e-learning by using online platforms to access learning content in the format of digital documents or videos, but they can do it both at home and on campus.

Additionally, Mason and Rennie (2006, 16), while discussing terminologies, referred to distance learning as print-based learning materials plus some form of online tutoring. This reference is backed up by Britain’s Open University distance learning scheme which utilized the postal service to deliver course materials as mails before the invention of tele-writing or audio-graphic system in 1976. Distance learning happened long before the internet was brought into life to enable education innovations. ASTD’s E-learning glossary defined e-learning as a subset of distance learning (ASTD 2000). In the digital age, technology affordance has enforced such innovation and made e-learning faster and more cost-effective. Meanwhile, paper-based learning has become inefficient and outdated. Therefore, with time, e-learning has been considered the primary method for distance education.

3.1.3 E-learning and blended learning

In the previous section, we know that e-learning refers to “new forms of distance delivery” that take advantage of the ICT development. We also learn that they are very distinct concepts. In fact, e-learning nowadays can happen regardless of the physical separation of the learner from the instructor. In higher education, teachers usually combined face-to-face (f2f) classroom activities with some amount of e-learning such as online assignments and assessments, virtual group discussions, and webinars. This way of learning is called blended learning.

Blended learning was introduced after e-learning. Although it is a common educational practice in higher education nowadays, but it was not common when it was first introduced. The initial purpose of e-learning was only to simplify distance learning. At the early stages of e-learning in higher education, face-to-face and e-learning environments remained largely separate because they used different media and addressed different needs of audiences (Caner 2012, 21). That is because face-to-face learning practices are, by nature, more synchronous and require more human interactions, while online learning can happen in an isolated and asynchronous manner. As a result, the two educational settings could not compromise and take place interchangeably.

With time, e-learning was gaining more and more audiences, yet showing more and more drawbacks. One of the drawbacks is the lack of the human interaction in learning activities. Students and teachers started to not only care about *the full advantage of anytime, anywhere learning* (Young 2004, according to Caner 2012, 21) but also the interaction and motivation aspects of it. That was when *a shift in dynamic away from learners interacting with computers to interacting with other humans via the computers* (Kern & Warschauer 2000, 11) became worthwhile. The need for collaboration between face-to-face and online learning leads the educators towards a new approach to teaching and learning which is called hybrid or blended learning (Caner 2012, 23).

There are nuances and complexity when it comes to the definition of blended learning. Because the word “blended” indicates a combination of two or more factors, many authors tend to define the concept in the vastest possible way. For example, Laster (2004, 154) insists that blended learning can be any kind of learning. Bersin (2004, 15) defines blended learning as a combination of different training media and methodologies. However, blended learning boils down to the combination of e-learning and face-to-face educational settings. One of the most transparent definitions is the one authored by Mason and Rennie. They refer to blended learning as courses that mix online and face-to-face components (Mason & Rennie 2006, 32). They also assert that the term had also been described as a range of technologies, a range of locations of the learning events and that *through the term continues to be used, it is beginning to lose all meaning*. However, the concept’s development process does signify that it was brought into used to make the

best out of both face-to-face and e-learning. Therefore, in this study, blended learning is regarded as a mixture of face-to-face and online networked learning practices.

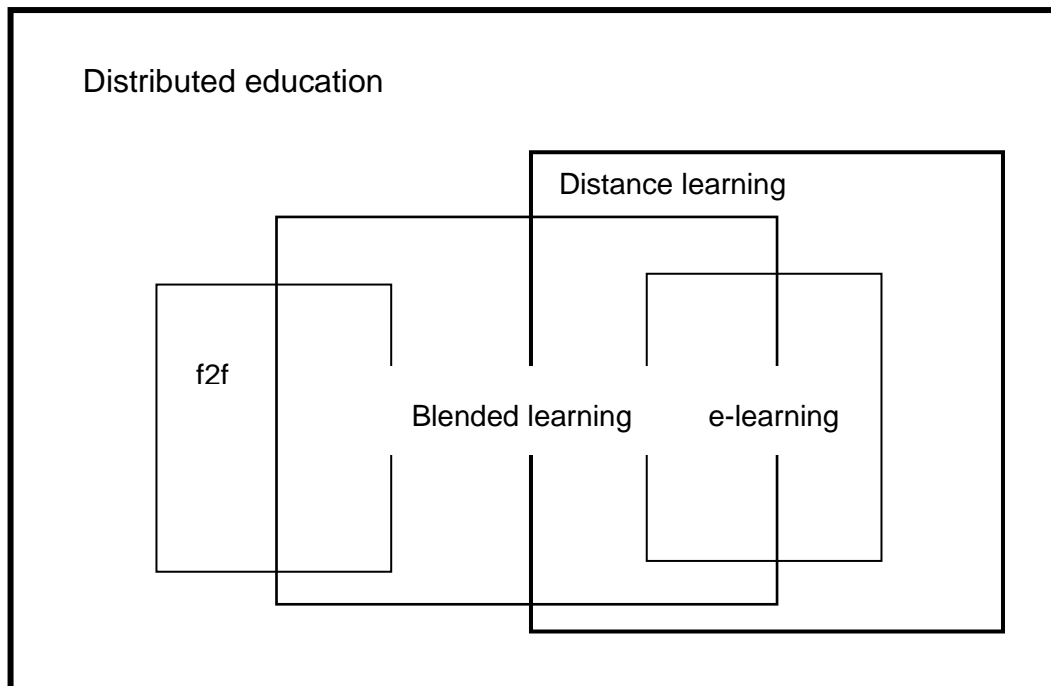


Figure 1. The relationship of e-learning to distributed learning (Mason & Rennie 2006)

To give a better understanding of blended learning, Mason and Rennie (2006, 32) also mention the proportions of e-learning and face-to-face learning in blended learning. They are convinced that a 50/50 model or even 75 percent of online learning is successful in overcoming the limitations of online learning while benefiting from its overall cost-effectiveness and flexibility. Canner (2012, 26) created a classification table (Table 1) where he specified that online learning takes up 30-79% of blended learning.

Proportion of Content Delivered Online	Type of course	Typical description
0%	Traditional	Course with no online technology used - content is delivered in writing or orally.

1 to 29%	Web Facilitated	Course, which uses Web-based technology to facilitate what is essentially a face-to-face course. Uses a course management system (CMS) or Web pages to post the syllabus and assignments, for example.
30 to 79%	Blended	Course that blends online and face-to-face delivery. Substantial proportion of the content is delivered online, typically uses online discussions, and typically has some face-to-face meetings.
80+%	Online	A course where most or all of the content is delivered online. Typically have no face-to-face meetings.

Table 1: Classifications of blended learning (Caner 2012)

3.2 Learning Management System (LMS)

When it comes to the delivery of distance learning, many media have been brought into use ranging from interactive TV and CD-ROM to computer-based training programs and internet/intranet platforms. While interactive TV and satellite broadcast are generally tailored for mass education, CD-ROM and audio-/videotapes are considered as the legacy means of e-learning. Nowadays, there are needs for proper administration and distribution of learning content in different sectors of education. However, the idea of storing data in compact discs has been succeeded by the internet and data servers. Therefore, educationalists had to come up with a tool powered by the internet to support e-learning even further. In the next three sub-sections, the thesis discusses about LMS definition, features, and technical functionalities.

3.2.1 LMS definition

According to ASTD's E-learning Glossary, a learning management system (LMS) is a software that automates the administration of training events. It registers users, tracks courses in a catalog, and records data from learners. It also provides reports to management. (ASTD 2000.) The term is often considered to be closely

related to content management system and course management system, both of which is abbreviated to CMS. A content management system is defined as a software application that streamlines the process of designing, testing, approving, and posting content on Webpages (ASTD 2000). A course management system is said to provide an instructor with a set of tools and a framework that allows the relatively easy creation of online course content and the subsequent teaching and management of that course (EDUCAUSE 2003, 1). Comparing the two interpretations, they share the same idea of content creation and course authoring, which is completely absent in the definition of LMS. Despite the common confusion towards LMS and CMS, LMS focuses mainly on the administration, management, and delivery of the learning content instead of the authoring part.

Nevertheless, there is another term that combines the theories of LMS and CMS into one acronym – LCMS. LCMS is a learning content management system, that is a software application that allows trainers and training directors to manage both the administrative and content-related functions of training. An LCMS combines the course management of an LMS with the content creation and storage capabilities of a CMS. (ASTD 2000.) Compared to CMS, LCMS is a version that is more targeted to the training field. But compared to LMS, LCMS is more about the *challenges of creating, reusing, managing, and delivering content* than the *logistics of managing learners, learning activities, and the competency mapping of an organization* (Oakes 2002, 74).

This study mainly tackles LMS rather than LCMS and CMS. Having said that, it regards LMS as having developed from the integrated learning system (ILS), which was defined by Bailey (1993, 3-4) as complex, integrated hardware/software management systems using computer-based instruction. Besides, in some specific countries, instead of LMS, academics also use the term virtual learning environment (VLE). A VLE shares a significant number of key features with LMS, as it *provides the facilities for presenting content, for online communication, for assessment, and for tracking student activity* (Mason & Rennie 2006, 33). Within the thesis's context, ILS and VLE are interchangeable with LMS. However, LMS is a more modern and widely used term. Therefore, to keep the consistency, this study will only use the term LMS when mentioning e-learning platforms.

3.2.2 LMS features

Different LMSs can have different combinations of features and functionalities. Many popular LMSs are open source, making them even more customizable in terms of features. However, some functions are more essential and considered as the bare minimum when it comes to LMS's feature requirements. These functions include the capability to disseminate knowledge, assessment of learner competency, the recording of learner attainment, support for online social communities, communication tools, and system security. (Turnbull et al. 2019, 3.)

LMSs' fundamental features can be categorized into four basic groups:

- Learning content management and distribution
- Communication and notification
- User interaction
- Administration and coordination

First, LMS is a learning management system at its core. It helps streamline the training process and create a centralized learning environment. This can be demonstrated by the fact that LMSs usually have similar hierarchical structures of learning contents. For instance, a course can be constructed by smaller learning modules, each of which covers a specific chapter. A module can be an array of different learning media, materials, and activities, which are authored and uploaded by the teachers/instructors. A course usually has multiple types of assignments and/or a final test so that the learners can be assessed. Above the course level, there are curricula and certifications. All together, they created a centralized way of learning distribution.

Communication and notification refer to such features as reminders of deadlines and schedules, automatic emails and announcements related to the course, and so on. This group of features can be widely varied depending on the LMS vendor, as well as the learners' needs. Turnbull et al (2019, 3-4) classified communication within LMS as synchronous and asynchronous. Synchronous communications can be ad hoc ways such as emails and discussion boards. Asynchronous communications are real-time activities like video conferencing.

The interaction aspect of LMS enables further collaboration among students and feedback channels and between teachers and students. It can be seen in such activities as grading, giving feedback, group discussions, and live chats. In general, interaction features are any features that *try to replicate a social environment online* (Turnbull et al. 2019, 4).

Administration and coordination refer to the facilitating and monitoring of learning process. This group involves such features as registering users, tracking courses in a catalog, recording data from learners, providing reports to management, and so on (ASTD 2000). These features are always tied to an admin role in LMS systems.

3.2.3 LMS technical functionalities

Technical functionalities lie beneath the user interface layer and make LMS surpass CMS in education settings. The availability of these functionalities also depends largely on whether the LMS is open-source or proprietary and whether the LMS is free or commercial.

Learning and user management is one of the most fundamental yet vital of an LMS. Institutions and organizations that utilize e-learning often need to create more learner accounts, push learning content to specific learners, enroll learners in courses, deactivate users, and so on. These actions are categorized as the administration and coordination features. LMSs usually try to optimize learning management for administrators by, for example, automating tasks, scheduling activities, and visualizing learner reports. In addition to learning management, user management is another segment of an LMS architecture. User role assignment makes LMSs more agile and, thus, able to support upscaling organizations more effectively. Regarding user roles, different LMSs may have different structures. However, they mostly share the same hierarchy that divides the roles into two groups of course-level roles and account-level roles. Course-level roles are tied to the learner and learning content management activities, which involve such roles as teacher/instructor, teaching assistant, course author, and student. Account-level roles tackle high-level operations and are often performed by super admins/global admins, local R&D personnel, or group admins.

Secondly, LMSs nowadays conform to one or more e-learning communication standards. E-learning communication standards are sets of rules and specifications of how contents are authored to work seamlessly with different LMSs. Without a standardized specification, each data supplier or tool developer would rather expect others to conform to its own data structure (Bianco et al. 2004, 2). Thanks to the development of e-learning standards, contents are sharable, playable, and able to communicate to multiple LMS. Ranging from simple learner completion to detailed activities and interactions, different standards can provide various solutions to LMS to track the learning process. For years, nearly every LMS follows SCORM standard. But the ability to support multiple e-learning standards will help LMS become a successor to others.

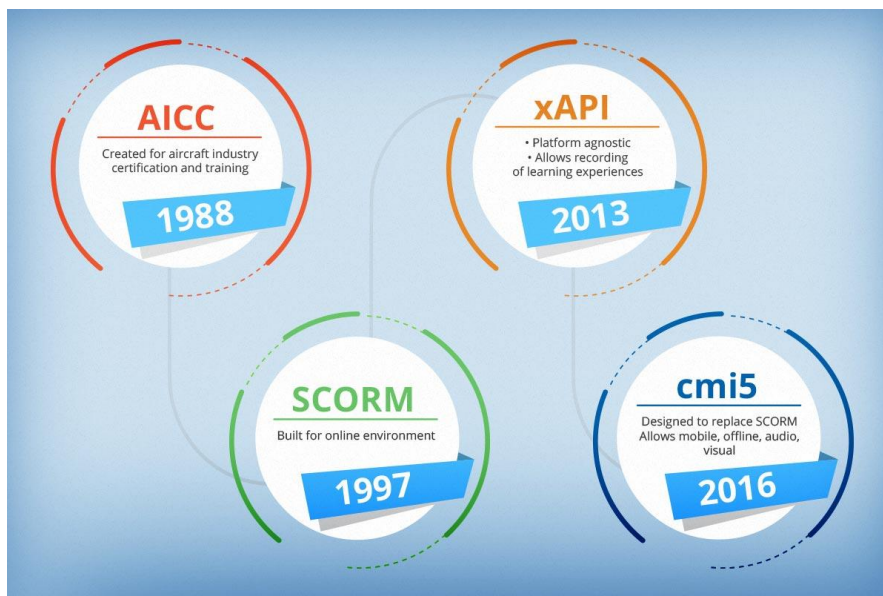


Image 2. E-learning standards timeline (Mardinger n.d)

On top of that, LMSs need to be customizable and brandable to a certain extent. Companies that use e-learning or education institutions often want to freely integrate their brand material to outsourced LMSs. Even though some LMS vendors are more rigid towards these requirements, most of them need to fulfill at least to a certain extent. Some LMSs support further with scalability and migratability, while some others focus more on responsiveness and accessibility as their selling points.

Recently, some vendors have made their efforts to integrate AI and machine learning into their products. The potential goals are, for example, admin task

automation, personalized learner experience, automated grading, machine-generated quizzes, and so on. Gamification also gains more and more interest. The concepts of challenges, rewards, rankings, and so on make learning more enjoyable. There are more and more technical functionalities that LMS vendors have tested and brought into use.

4 OVERVIEW ABOUT E-LEARNING IN FINNISH HIGHER EDUCATION

4.1 ICT development in Finnish higher education institutions

In Finland, higher education is funded by the government and municipalities. Since the start of the 21st century, Finland has made significant efforts in increasing ICT application in education, which can be seen through multiple initiatives from 2000 to 2006. In 1999, the Ministry of Education published an Information Strategy for Education and Research 2000–2004 Implementation Plan. Some specific initiatives were announced, one of which was the start of a Finnish Virtual University. For the years 2001-2003, the University of Helsinki also included ICT administration in their Strategic Plan, which anticipated a sharp rise in the next few years in the number of virtual courses and the amount of network learning material available. (Huisman & Bacsich 2004, 19-28.) They declared their mission to improve network reliability and server capacity to meet the growing ICT needs. They also founded an educational center for ICT that oversaw the development of flexible web-based supporting services for university teachers and students, as well as other projects under the framework of online learning. During the earlier 2000s, many R&D projects involved experimenting with different ways of delivering learning content in Finnish HEIs such as the E-book project, UniWap 2000 project, and the Finnish Virtual University projects (Huisman & Bacsich 2004, 34-36). In 2002, Finland was the third-highest country in Internet use by adults with 62% of the whole population (OECD 2003, 86). That high Internet exposure boosted the integration of ICT further into adult education in the early 2000s in Finland.

During the next two decades, technology advancement has enabled more e-learning activities in higher education. More activities have been trialed to challenge the readiness of Finnish universities in online learning. Many of them were integrated in the blended learning settings. Blended learning was dealt with for the first time in Finland in 2005 in the online publication *Piirtoheitin*, where the authors translated the term “blended learning” into Finnish as “sulautuva opetus”. In March 2007, the first national one-day blended learning seminar (*Sulautuva opetus – seminaari*) was held with the main purpose of having teachers share their own blended learning experiences with their peers. After the seminar, many publications were made, and initiatives were had that led to more concrete programs. The

event was also proved to be successful as it was also arranged in the following years. (Joutsenvirta & Myyry 2010, 5-6.)

“Introduction to Media Education” was a blended course organized at the University of Tampere in the autumn of 2008. The organizers claimed that they wanted to develop a blended but simple course with respect to the study culture in higher education that is becoming more and more penetrated by the ubiquitous technologies. The course was enrolled by a big number of 142 students, making it an important project to test the capability of blended learning approaches. The organizers employed Moodle as a platform for learning content, Adobe Connect Pro for online lectures, and weblogging as an optional way to do assignments. Students' feedbacks show the importance of the weblog and Moodle platform to the success of the course. (Portimojärvi & Rantala 2008, according to Joutsenvirta and Myyry 2010)

The web-based virtual patient pool project (VPP) was also a project continuously developed from 2004 and 2006 in the medical faculty of the University of Helsinki. Its goal is to develop web-based software to simulate the natural process of clinical examination of adult patients. With this system, teachers can take part in designing the properties of a virtual patient to suit a specific learning emphasis. Teachers can also provide standards, which can be used to grade students' performances. This project facilitated another modality in the medical curriculum, in addition to theory lectures and grand rounds. Even though, this project was a success considering the practicalities. (Tuominen & Romanov 2008, according to Joutsenvirta and Myyry 2010)

There are many other research projects about practicalities, processes, and quality assurance in the context of Finnish higher education e-learning. In many areas of higher education, web-based learning is used as a natural way to organize teaching and many good practices can be observed. Nevertheless, in Finnish higher education, it is still a portion of blended learning. The e-learning forerunner remains open universities with versatile learning opportunities. In most universities and UASs, students do not have that much choice regarding the mode of teaching they receive. (Owusu-Boampong & Holmberg 2015, 10-11.) The current way of organizing learning activities still depends largely on physical lectures. LMSs are

partially used for materials and assignments allocation. With that being said, in the attempt to make learning more flexible in higher education, the Finnish government has actively funded many e-learning projects. One of these projects is the introduction of cross-study possibilities at the UASs in the form of the CampusOnline portal (Moitus et al. 2020, 130). CampusOnline is a MOOC provider that offers courses from many Finnish HEIs. Students in Finnish universities and UASs can take MOOCs as a part of their complementary study. Finnish policy and higher education experts also anticipate e-learning developments in Finnish higher education in the near future, with CampusOnline as a good starting point (Moitus et al. 2020, 88).

4.2 E-learning implementation and tools usage from students' perspectives

4.2.1 E-learning implementation

Finnish higher education has been a blended learning environment before the Covid-19 pandemic. MOOCs were offered as an alternative way for students to gain credits. In the survey conducted for this study, participants were asked if they could take online courses before Covid-19. Figure 2 shows that only 19.4 percent of the respondents were not offered the chance to take online classes as part of their program. More significantly, 29 percent of them replied "yes" as to whether they were allowed to take online courses. More than half of the respondents specified that they were allowed to take online classes on some rare occasions. This indicates that Finnish degree programs are quite flexible with the student's study path.

4. Were you offered the chance to take online courses as part of your program?

62 responses

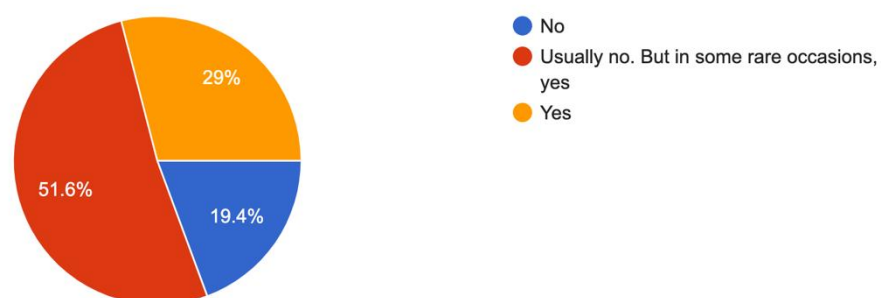


Figure 2. The possibility to take online courses in Finnish higher education

When it comes to the platforms or providers that they took the online courses, 66.7 percent of the respondents selected CampusOnline. External MOOC providers are also a common option as 27.5 percent of the students chose to take their online courses there. The remaining answers were divided into two selections, with 5 students selecting Open University/Open UAS of their institute and 5 students opting in for other providers. (Figure 3.)

5. If you had course of which lecture are always delivered online, where did you find the courses?
51 responses

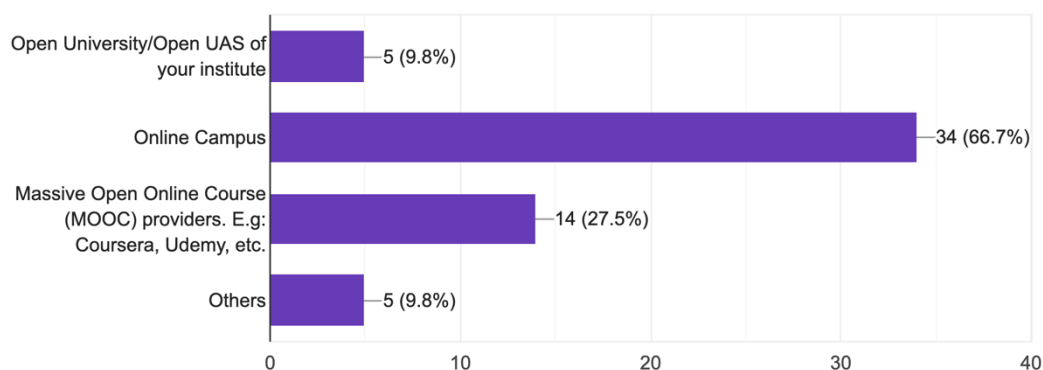


Figure 3. Providers for online courses degree students in Finnish higher education

4.2.2 E-learning tool usage

LMS has an important role in e-learning and blended e-learning. However, in Finnish higher education, there is no official statistic of different LMS choices. Amongst LMSs used in Finnish higher education, Moodle appears to be the most popular. It is currently the selected LMS by many institutions such as the University of Helsinki, Tampere University and University of Applied Sciences, Oulu University, and Jyväskylä University of Applied Sciences. In the survey conducted for this thesis, the respondents were asked about the LMS that their institution has been using. Their answers show that the open-source integrated application, Moodle, has been used by most of the institutions, accounting for 82.3 percent. 21 percent of the survey participants indicated that their institution had their own system for teaching activities. (Figure 5.) It is possible that some respondents selected the

institute's e-learning platform option because they were not sure if their LMS is provided by Moodle or other vendors. Therefore, this ratio cannot depict the whole Finnish higher education regarding choices of LMS. However, it can still prove that Moodle is a prominent LMS provider in Finnish HEIs.

1. What is Learning Management System (LMS) your institute had been using in teaching activities?

62 responses

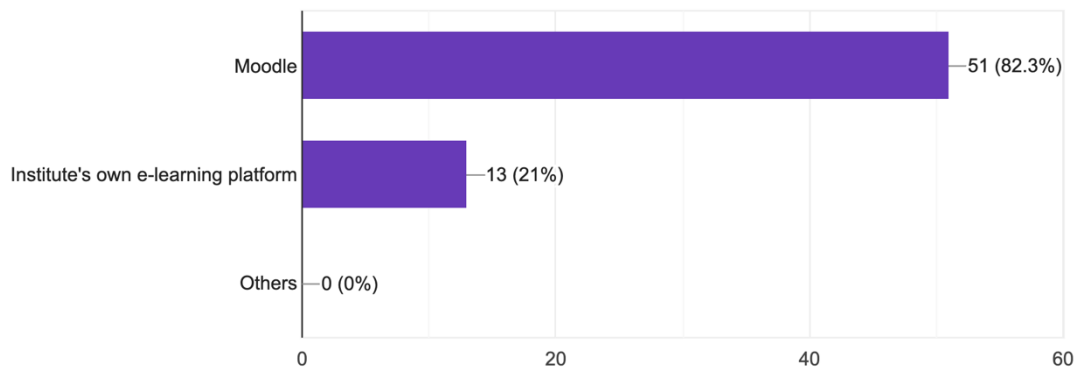


Figure 5. E-learning tool usage in Finnish higher institutions

As for the level of tool usage, the survey participants were asked to rate their confidence in using the tool. The answers show an above-average exposure of the respondents to e-learning tools they used in school. Many of them indicated that they are completely confident by choosing 5 on the Likert scale (37.1%). 27.4 percent and 32.3 percent of the respondents selected 4 and 3 respectively as their confidence level. Only 2 students implied that they are not so confident by choosing 2. (Figure 6.) Overall, this suggests that the students have used e-learning tools on a regular basis. In the time of crisis, this will help them cope with the online learning condition better.

2. On the scale of 1 to 5, please rate your confidence level in using your institute's e-learning tools
62 responses

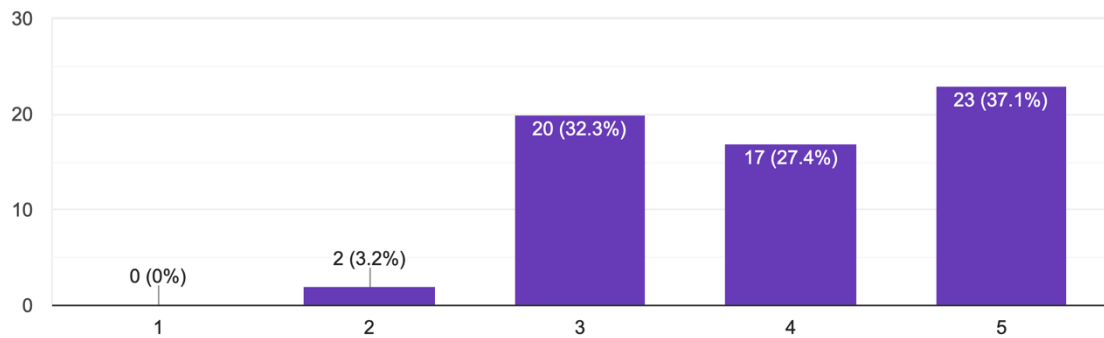


Figure 6. Students' confidence level in using e-learning tool in Finnish higher education

To further examine the e-learning readiness, teachers' performance from students' angles was also brought into the survey. More than half of the responses voted for 4 as for how good their teachers are at organizing class activities and learning content in e-learning tools (56.5%). 30.6 percent of them agreed on a median score of 3. Only 7 students thought that the teacher's performance in e-learning tools is under average. (Figure 7.) Generally, Finnish higher education teachers have a decent performance in organizing activities in e-learning tools.

3. On the scale of 1 to 5, please rate how well your teachers organised classes' activities and learning contents in those e-learning tools?

62 responses

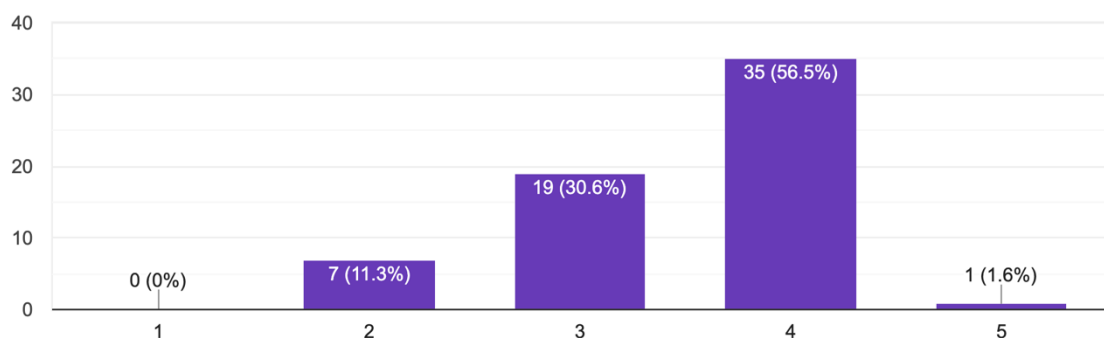


Figure 7. Teachers' performance in e-learning tools from students' perspectives in Finnish higher education

5 E-LEARNING IMPLEMENTATION IN FINNISH HIGHER DURING THE COVID-19 PANDEMIC

5.1 National measures and initial observations

In this section, the thesis discusses the state of e-learning in the Covid-19 pandemic based on national policies and observations. This section focuses on the national and Finnish higher education management level's viewpoints. The first part of this section mentions general measures and actions by Finnish government and Ministry of Education and Culture regarding online learning. The second part of this section presents initial observations of the e-learning implementation in Finnish higher education during the earlier phase of Covid-19.

5.1.1 Measures

In Finland, the national administration of education and training has a two-tier structure of The Ministry of Education and Culture and The Finnish National Agency for Education (EDUFI) (EDUFI 2020, 6). While EDUFI is more responsible for early childhood to upper secondary education, the Ministry of Education and Culture takes a more active role in higher education funding and facilitation. Universities Finland (UNIFI), an association of Finnish research universities that is represented by rectors. When the pandemic surfaced, it began to collect and coordinate nationwide information on universities to provide a platform for discussions, negotiations, and coordination. Rectors at Finnish universities also communicated through UNIFI to increase joint collaboration and the actions taken in response to the crisis (Pekkola et al. 2021, 2).

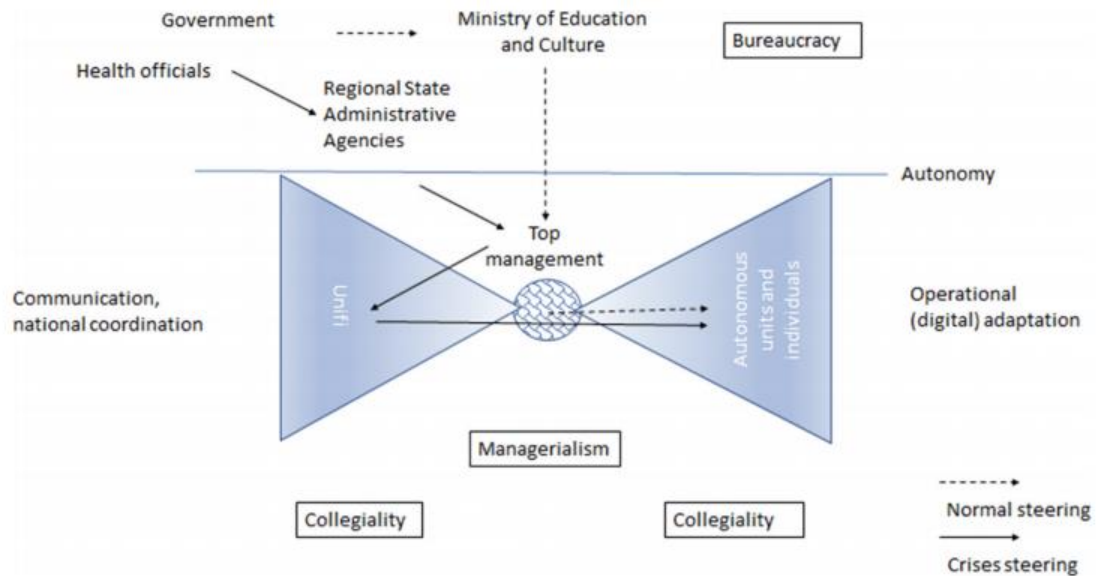


Figure 8. A hierarchal depiction of the management and guidance of Finnish higher education during the emergence of the Covid-19 pandemic in March 2020 (Pekkola et al. 2021, 3)

On the 16th of March 2020, the Ministry of Education and Culture decided that contact teaching would be replaced by distance education at schools and educational institutions. This was the first measure taken to contain the spread of the virus as the cases were starting to rise in Finland. This led to the closing of facilities of schools, educational institutions, universities, UASs, adult education institutions, and other liberal adult education providers, as well as to the suspension of contact teaching (EDUFI 2020, 1). On the 30th of March, the extension of the initial restriction on contact teaching was decided to be valid until the 13th of May. As the summer holiday ended and a new semester approached, the guideline was updated again on the 4th of August 2020. According to the guideline, providers of HEIs were able to flexibly decide on safe and appropriate teaching methods and arrangements. However, the remote ways were still recommended especially if teaching is arranged for a large number of people.

Finnish Universities and Universities of Applied Sciences have followed closely guidelines and recommendations given by the Ministry of Education and Culture. In the beginning, they went into complete contact teaching suspension. As the amendments were put into place, most of them still kept their teaching activities remote and online. Teaching and learning activities have been mostly versatile and

mobile in 2020 and the first half of 2021. Almost all the HEIs estimate to have less student mobility in the academic year 2020/21 compared to normal (EDUFI 2020).

5.1.2 Initial observations

According to EDUFI, the transition to and delivery of distance education in Finnish schools and educational institutions were highly successful considering the circumstances (EDUFI 2020, 2). While this is a general statement, the real situation might vary a lot depending on the type of education and the student demographics. In the initial observations document by EDUFI, they stated that the availability of ICT devices and primary knowledge in Finnish basic education contributed a lot to this early success. However, this might not be the case for higher education.

Statistically, there are no national indications of how well remote online teaching and learning has been performed in Finnish HEIs. But there are some observations on the HEI management level regarding the Covid-19 coping strategies in general. From a survey administered to the top and mid-level managers at Finnish universities, some findings can be drawn out. Overall, university top management (rectors and vice-rectors) and middle management (deans) reported that the Covid-19 pandemic had been managed effectively at Finnish universities (Pekkola et al. 2021, 4). While most positive responses were related to communication, central administration, and IT support function, slightly negativity can be seen from responses towards research and international activities as well as social impacts (Figure 9.)

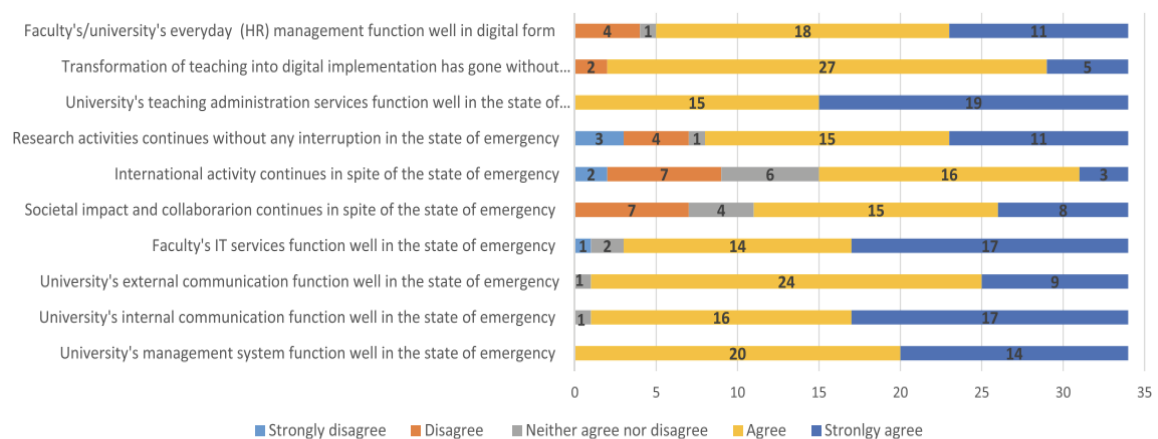


Figure 9. Coping strategies during the crisis included an assessment of the managerial systems and operational capabilities by the deans and rectors (Pekkola et al. 2021, 4)

When it comes to e-learning, in particular, the impact was not very apparent in the big context of Finnish higher education. The Covid-19 pandemic affected higher education but to a lesser extent because higher education institutions have various tools available for distance learning (European Commission 2020). However, from the students' points of view, there are still certain problems regarding the sudden change at the onset of the pandemic. According to a survey targeting international master's degree students in Finland, some of the problems were admitted such as cancellation of study-related plans, discontinuation of courses, and concern over degree completion (Pappa et al. 2020, 240). These were allegedly caused by the disruption of contact teaching and the stress to cope with online distance learning. Some students, on the other hand, express positive attitudes towards an online replacement of their study and the supervision and support they have received from the teachers (Pappa et al. 2020, 247).

5.2 E-learning implementation from student's perspectives

In the survey administered to higher education students in Finnish HEIs, a collection of questions was asked. These questions asked about common learning practices, students' and teachers' general performance, and their attitudes towards e-learning post-crisis. This section mainly discusses the survey results.

5.2.1 Common practices

Since August 2020, the national guideline has given providers of HEIs the right to flexibly decide on safe and appropriate teaching methods. In most of the institutions, the teaching and learning activities continued to be done online and distantly. From the survey, 71 percent of the respondents stated that their institution suspended on-site learning activities. 29 percent said that the suspension was partial. (Figure 10.) As for modality of studying, 71 percent of the students have studied online since the start of the pandemic in Finland, while 29 percent of them have switched between online and classroom-based classes from time to time.

(Figure 11.) Despite the amount of f2f learning being implemented, most of the students have studied completely online as being seen from these two figures.

6. During the Covid-19 pandemic in Finland, has your institution suspended on-site learning activities?

62 responses

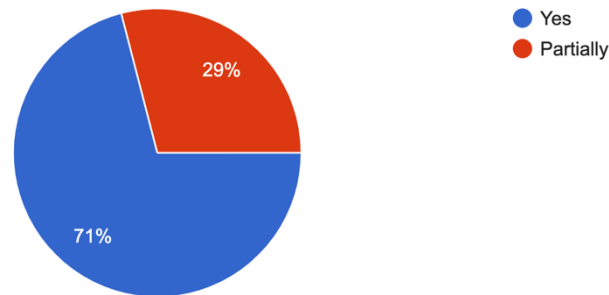


Figure 10. How Finnish HEIs implemented school closure and on-site activity suspension during the Covid-19 pandemic

7. How has you been taking classes since the start of Covid-19 pandemic in Finland until now?

62 responses

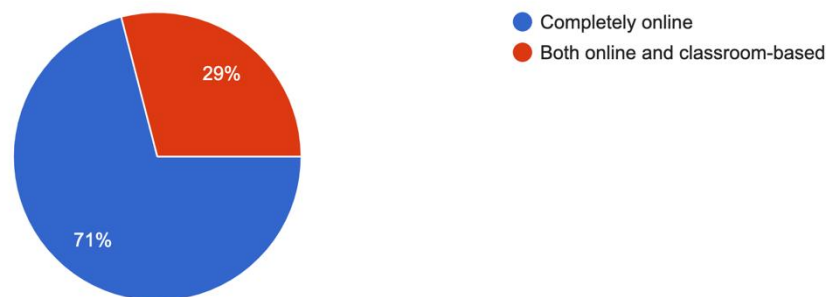


Figure 11. How Finnish higher education students have been taking classes during the Covid-19 pandemic

The survey also studied the methods by which teaching and learning activities have been carried in Finnish HEIs. There were multiple options to choose from and the responses showed some diversities. All the respondents have used online video conferencing tools. 87.1 percent of them have studied through external integrated learning/teaching apps, while 25.8 percent of them studied on their institution's owned platform. 35.5 percent and 21 percent of the respondents also

studied accordingly with audio recorded presentations and lecture videos made by their school's or other institutions' teachers. (Figure 12.)

8. Please select online teaching/learning methods that you and/or your institute have used on the daily basis during Covid-19 time

62 responses

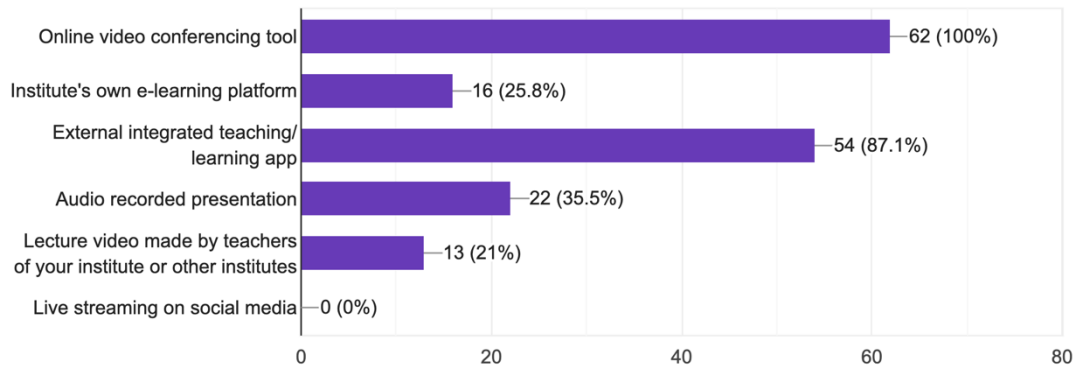


Figure 12. Common teaching/learning methods in Finnish HEIs during the Covid-19 pandemic

5.2.2 Performance assessment

When it comes to performance in online learning during the pandemic, both students' self-assessment and assessment of teachers in teaching and coordinating were brought into question. Even though this survey studies students' opinions only, the results can reflect their HEIs and teachers' performance.

5.2.2.1 Students' performance

First, the students were asked to assess the difficulties caused by distance learning activities. The responses were quite positive with 14.5 percent of them expressing no hardship at all. At the other end, only 4 students (6.5%) expressed absolute frustration over the distance learning situation. More significantly, 32.3 percent of the respondents indicated that the challenges were minimal. However, the most common opinion was that distance learning was more difficult in the beginning. (Figure 13.) This implies that the online learning modal can be improved over time. This also means that the students' ability to cope with distance learning has improved.

9. Have you had any difficulty practicing distance learning activities?

62 responses

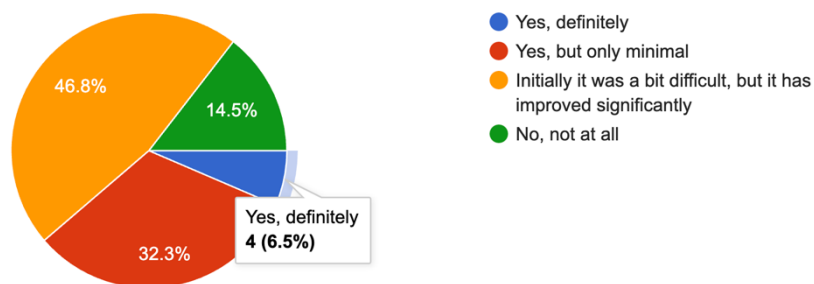


Figure 13. The experienced level of difficulty in doing distance learning activities in Finnish higher education

Delving into the difficulties the students have encountered, teamwork problems accounted for 40.3 percent of the responses. The second most common problem, in accordance with 32.3 percent of the responses, was classroom interaction limitation. Generally, these two problems are quite objective and unavoidable. In addition, 18 and 16 students admitted to having experienced technical problems and lack of personal assistance, respectively. Learning content appeared to be the least common problem for being selected by only 7 students. (Figure 14.)

10. What have been your common problems when taking distance online classes?

62 responses

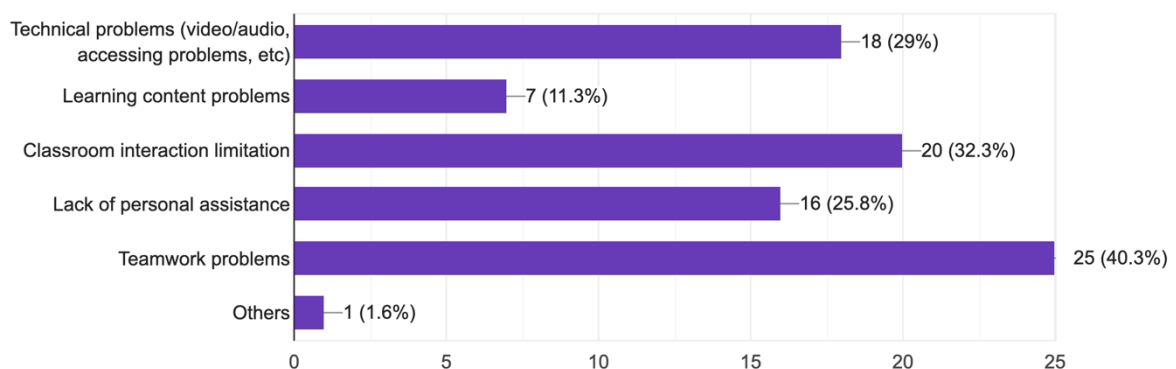


Figure 14. Common problems taking online classes according to Finnish higher education students

Regarding the possibility of online learning being more beneficial to the student's academic performance, 52 respondents ruled it out. Among them, 33.9 percent agreed that classroom-based learning was more effective, while 45.2 percent said that both contributed the same to their academic result. Nevertheless, there was 21 percent of the answers in favor of online learning. (Figure 15.) Based on this figure, most of the respondents agreed that their performance was the same despite learning delivery modalities. This hints that the Finnish higher education students can be highly tolerant of the learning condition.

11. Has online learning outdone classroom-based face-to-face learning when it comes to benefiting your academic performance?

62 responses

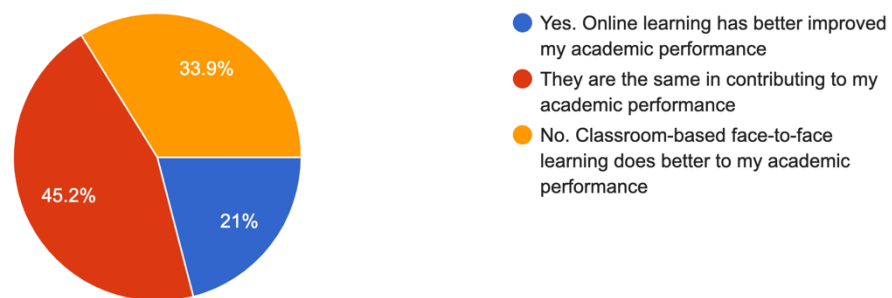


Figure 15. Finnish higher education students' opinions on a more beneficial learning delivery method: online vs classroom-based learning

5.2.2.2 HEI and teachers' performance

The survey investigated how well some HEIs reacted to the Covid-19 pandemic from the students' perspectives. One of the questions tackles how good the management-level decision-making is within the institutions. The management-level performance can be examined based on coping strategies, information channels, and general flexibility. Most of the respondents showed positive feedback with 62.9 percent indicating that they were completely satisfied. Only 2 students were not really satisfied. The rest of them stated that they were somewhat satisfied. (Figure 16.) Regardless, this shows that many Finnish HEIs have managed well under the condition of Covid-19.

12. Are you satisfied with the way your institute reacted to and facilitated teaching/learning activities despite Covid-19?

62 responses

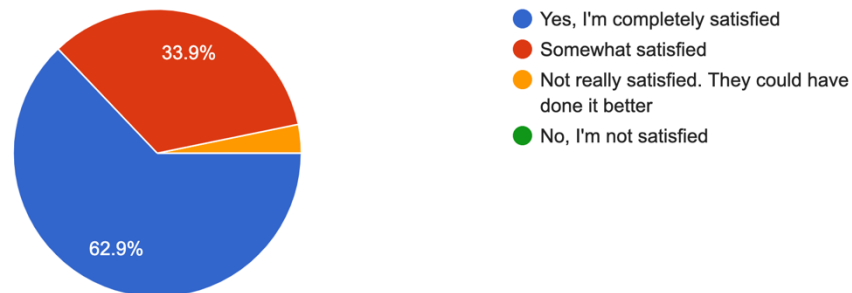


Figure 16. Finnish higher education students' satisfaction levels of their institution's reaction and facilitation during the Covid-19 pandemic

As to the teachers' performance, the survey participants were asked to rate their teachers' presentations in online classes on a scale of 1 to 5. The answers showed inclination towards a good and very good score of 4 and 5. As much as 54.8 percent of the respondents voted for 4 and 43.5 percent of the respondents voted for 5. Only 1 person voted for a modest score of 3. (Figure 17.)

13. On the scale of 1 to 5, please rate the overall performance of your teachers in online classes during Covid-19 pandemic

62 responses

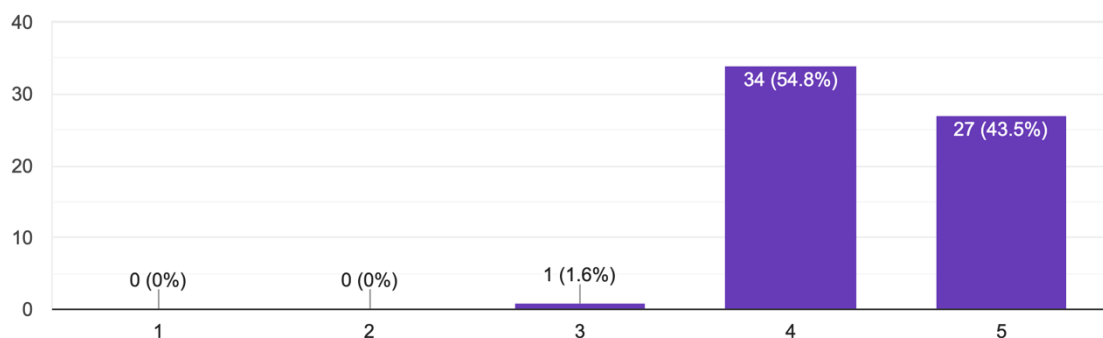


Figure 17. Finnish higher education students' opinions on teachers' performance in online classes during the Covid-19 pandemic

As a follow-up to the previous question, the survey asked the students to specify one area that their teachers have done the best in distance learning during the Covid-19 pandemic. Most of the respondents agreed that the teachers had given

the best performance in organizing and delivering virtual classrooms. Meanwhile, the teachers' ability to organize online learning content and their ability to provide in-time support both received an equal number of votes, accounting for 21 percent of the replies. (Figure 18.)

14. Please specify one area that your teachers have done the best during the time of distance learning
62 responses

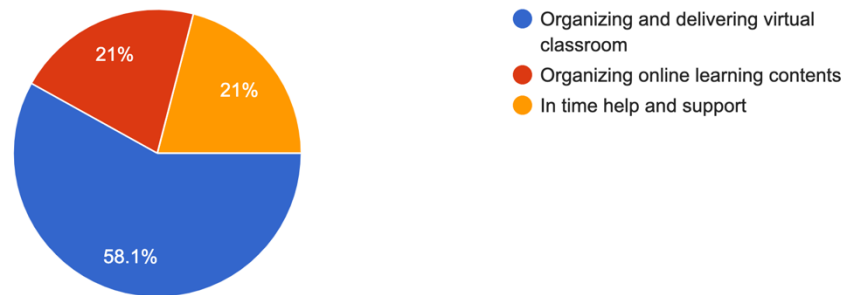


Figure 18. Finnish higher education students' votes for the area in which their teachers have done the best during distance learning

5.2.3 Motivation to continue after Covid-19

The possibility of Finnish higher education changing to a hybrid environment involves many parties' decisions. Within the scope of this thesis, it can only focus on understanding students' motivation and perspectives. In the self-administered survey, the first group of 27.4 percent of the respondents said that they were unmotivated to continue online learning after the pandemic. The second group accounting for 41.9 percent of the students expressed their reluctance by choosing "Maybe. I'm not sure". However, this still means that the second group are more likely to take online classes than the first group. Those that are willing to continue e-learning post Covid-19 accounted for 27.4 percent of the respondents. (Figure 19.) These findings prove further the diversity in the student preferences regarding the delivery methods of learning.

15. Do you feel motivated to continue online learning if it is possible after Covid-19 pandemic ends?
62 responses

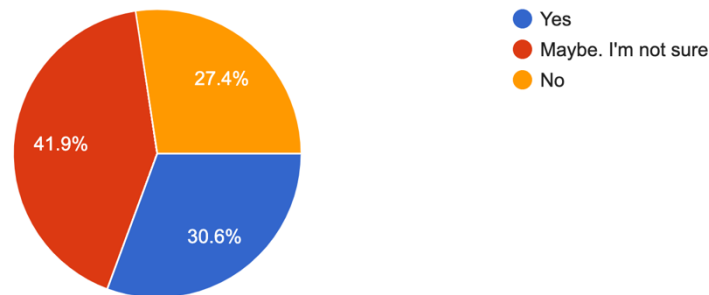


Figure 19. Finnish higher education students' motivation to continue online learning post Covid-19

About the reasons why some of the students wanted to continue online learning even after the pandemic, 66.7 percent of them believed that it would save time and cost for commuting. 35.4 percent and 33.3 percent of the respondents claimed that online learning's advantage was virtual collaboration and self-discipline improvement, respectively. The less popular reasons are flexible learning schedules (14.6%) and improved academic performance (12.5%). (Figure 20.)

16. If you feel motivated to continue online learning after Covid-19 pandemic ends, what are your reasons?
48 responses

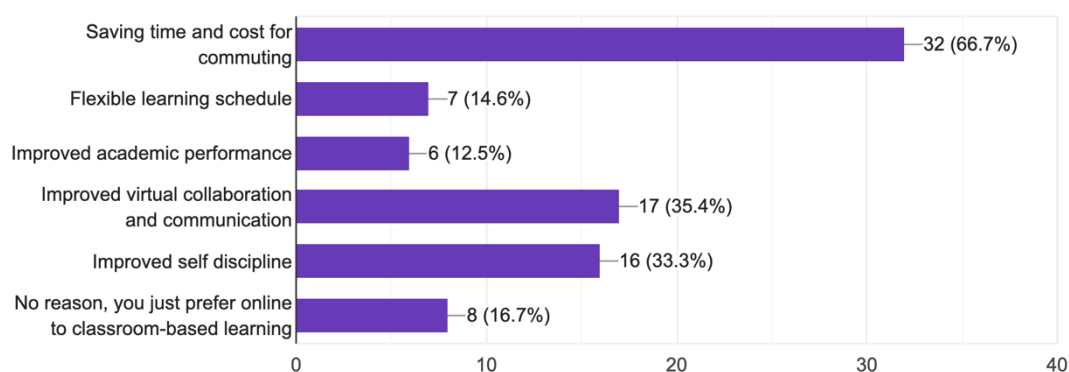


Figure 20. Finnish higher education students' reasons to continue online learning post Covid-19

The responses for why these students do not wish to continue further were divided more equally. 48.1 percent of them said that they did not want to continue e-

learning due to the unproductive collaboration and communication. Other typical reasons were lack of social interaction in class, learning demotivation and lack of support from the teacher, with 19, 19, and 18 votes respectively. Technical difficulties seemed to be a less significant reason as to why the students were not willing to continue e-learning. (Figure 21.)

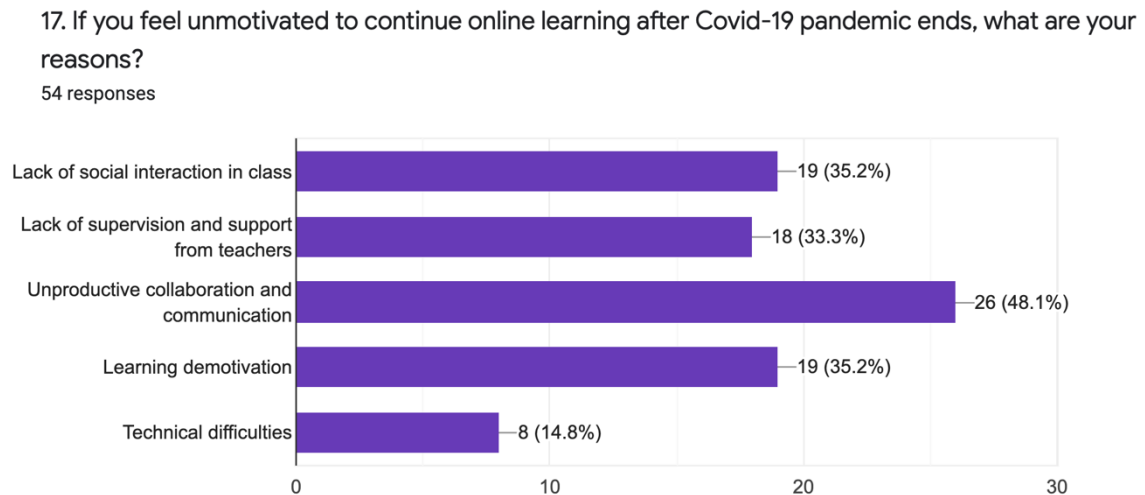


Figure 21. Finnish higher education students' reasons to not continue online learning post Covid-19

6 CONCLUSION

6.1 Summary

This thesis set the goal to study e-learning and e-learning in the Covid-19 crisis from Finnish higher education students' perspectives. Based on this goal, the study discussed subjects of e-learning, e-learning surrounding concepts, e-learning in Finnish higher education, and e-learning in Finnish higher education during Covid-19. The study utilized both qualitative and quantitative research.

Qualitative research was done to outline the theoretical framework. By doing qualitative research, e-learning and associated terminologies were unraveled. The thesis also distinguished e-learning from distance learning and e-learning from blended learning. Once their definitions were discussed, all three terms were used altogether throughout the thesis. Furthermore, a quantitative research method was also used to study the state e-learning in Finnish higher education before and after Covid-19. Secondary data collected for this quantitative method helped with presenting e-learning strategies and developments in Finnish higher education from the early 2000s to recent years. The thesis also discussed the Finnish government's, the Finnish Ministry of Education and Culture's, and the Finnish higher education sectors' coping policies in the Covid-19 pandemic. On top of that, a qualitative method was used in finding and analyzing reports about the initial observation of distance learning in Finnish HEIs. To sum up, this method was used to answer the research question one, two, three, and five.

In the second part of the thesis, quantitative research was done through the self-administered survey. The survey targeted Finnish higher education students. The main goal of the survey was to study the students' feelings and perspectives. Having said that, the survey did also include questions about practices and policies that Finnish higher institutions have done in the pandemic. The responses for these questions added more evidence to answer the third research question, in addition to data collected from the qualitative research. Moreover, the student's difficulties, preferences over specific methods, and opinions on their teachers' and school management's performances were questioned. To examine the transition in student's viewpoints, the questionnaire incorporated questions about e-learning

before Covid-19. To sum up, the survey was done to find the answers for research question three, four, six, and seven.

6.2 Findings

Following the research questions, here are the thesis's findings:

Question 1: What is e-learning, blended learning, and distance learning?

E-learning or online learning is any learning delivery modality that involved virtual connection via the internet. Distance learning is a means of learning in which the learners and the instructor are physically separated. Blended learning combines online learning and classroom-based learning to achieve *the full advantage of any-time, anywhere learning* (Young 2004, according to Caner 2012, 21) and classroom interaction.

Question 2: What is the fundamental element of these learning environments?

For e-learning, distance learning, and blended learning to happen, there is a tool called Learning Management System (LMS). There is a vast array of features that one LMS can do but some other LMSs cannot. But generally, LMS refers to an online platform to distribute, manage, and maintain learning content.

Question 3: What was the state of e-learning in Finnish HEIs before the Covid-19 pandemic?

E-learning was introduced in Finnish higher in the early 2000s through multiple development projects. In recent years, students have often experienced e-learning through MOOC. LMS is a frequently used tool in Finnish higher institutions, but LMS usages in Finnish HEIs were mostly for blended learning instead of online learning.

Question 4: How familiar are students in Finnish HEIs with Learning Management Systems and other concepts such as e-learning course providers and conferencing tools?

According to the survey, before Covid-19, students' confidence in using online tools was above average. This showed that they used the platforms on a regular basis. More specifically, most of the students used Moodle as the Learning

Management System of their institutions. Many students were able to take online courses from MOOC platforms such as Online Campus. Some of the students were also allowed to take online classes from external e-learning providers and open universities/open UASs.

Question 5: What has changed in Finnish HEIs as a result of the Covid-19 pandemic?

Nationally, there are no official reports about all the institutions' strategies. During the first period of the Covid-19 outbreak in Finland, school shutdown was mandatory. Later in the pandemic, higher institutions were more independent in deciding on their action based on the government guidelines. According to the survey, most of the learning has happened online since the onset of the pandemic in Finland. As for the e-learning tool, online conference tool, audio recorded presentation, and lecture videos were used besides LMS.

Question 6: How have Finnish HEIs' academic and student-related activities changed compared to the time before the Covid-19 outbreak?

From the survey responses, learning activities during the pandemic were mostly online with a small amount of blended learning. Quite a few of the Finnish HEIs suspended classroom-based learning partially, but many of them suspended completely. All the students used video conferencing tools to attend classes. Many of them also use external integrated teaching/learning apps in addition to LMS in their learning activities. The students also studied through audio recorded presentations and lecture videos.

Question 7: What are their points of view on continuing e-learning post Covid-19?

Finnish higher education students experienced some common difficulties in learning such as teamwork problems, classroom interaction limitations, and technical problems. Many students claimed that e-learning negatively affected their academic results. However, many of them were still motivated or more likely to continue e-learning after Covid-19.

6.3 Limitations

Regarding research limitation, the first problem is qualitative data shortage, especially about e-learning in Finnish higher education. Most of the resources discussed about e-learning development and strategies from basic to upper secondary education. There were just a few English resources about policies or common implementations in higher education. The thesis was focused on student's points of view. Nevertheless, not being able to study e-learning in Finnish higher education from authorities' views and national statistics has affected the reliability of this study.

Additionally, the quantitative method of the survey has observed some difficulties. Initially, a sample size of 70 and a response rate of 100 percent were aimed for. However, during the response collecting process, 8 people to whom the survey form was sent did not return their answers. Moreover, the data gathering process was prolonged from four to ten weeks. In the end, the survey form was closed with 62 responses. On top of that, even though pilot testing was conducted before the survey distribution, there were some potential wording problems with the questions that were only recognized afterward. These problems appear in the first and eighth question's options. Some of the questions are lengthy and prone to misunderstanding.

During the quantitative data collection, the thesis also faced a problem that had an impact on the external validity. Initially, the thesis used cluster sampling method for defining the clusters for the survey. As mentioned in the section 2.3.3, survey data collecting process, the final samples should be selected randomly from random clusters. However, the survey delivery method through connections on LinkedIn, Facebook, and personal email introduced the possibility of being biased. In reality, there were several clusters from which more samples were drawn. At the same time, there were clusters that no sample was selected from. There were also clusters from which samples were selected but no responses from these samples were returned.

These limitations altogether lead to the chance that the survey data can still be biased. And while the survey initially intended to make a generalization, these limitations suggest otherwise.

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APPENDICES

Appendix 1. Questions in the survey administered to Finnish higher education students:

Before the Covid-19 pandemic

1. What is Learning Management System (LMS) your institute had been using in teaching activities?
2. On a scale of 1 to 5, please rate your confidence level in using your institute's e-learning tools
3. On a scale of 1 to 5, please rate how well your teachers organised classes' activities and learning contents in those e-learning tools?
4. Were you offered the chance to take online courses as part of your program?
5. If you had course of which lecture are always delivered online, where did you find the courses?

During the Covid-19 pandemic

6. During the Covid-19 pandemic in Finland, has your institution suspended on-site learning activities?
7. How has you been taking classes since the start of the Covid-19 pandemic in Finland until now?
8. Please select online teaching/learning methods that you and/or your institute have used on the daily basis during the Covid-19 time
9. Have you had any difficulty practicing distance learning activities?
10. What have been your common problems when taking distance online classes?
11. Has online learning outdone classroom-based face-to-face learning when it comes to benefiting your academic performance?
12. Are you satisfied with the way your institute reacted to and facilitated teaching/learning activities despite the Covid-19?

13. On the scale of 1 to 5, please rate the overall performance of your teachers in online classes during the Covid-19 pandemic
14. Please specify one area that your teachers have done the best during the time of distance learning
15. Do you feel motivated to continue online learning if it is possible after the Covid-19 pandemic ends?
16. If you feel motivated to continue online learning after the Covid-19 pandemic ends, what are your reasons?
17. If you feel unmotivated to continue online learning after the Covid-19 pandemic ends, what are your reasons?