



Lappeenranta-Lahti University of Technology
LUT School of Engineering Science
Industrial Engineering and Management
Global Management of Innovation and Technology

Master's Thesis

**INDUSTRY-UNIVERSITY COLLABORATION IN CORPORATE TRAINING: A
STUDY OF FINNISH MARKET**

Anastasia Chakir

Examiner(s): Professor Leonid Chechurin

2019

ABSTRACT

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62 pages including 15 figures, 14 tables and 1 appendix

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In the context of digitalization and globalization, the concept of lifelong learning is gaining its popularity and reflects corporate training. The research addresses the question of whether enterprises and universities can mutually benefit from cooperation in this field. This Master's Thesis is a part of CEPHEI project. The key idea of the project is to bring together international teachers, students and industry to collaborate in the field of Industrial Innovations. Primary research method is a structured survey conducted among Finnish companies. The survey aims to assess corporate training activity and willingness to cooperate within the project.

The results reveal the high activity of Finnish companies in providing training opportunities for employees, it is also proved that Finnish enterprises prefer internal face-to-face corporate training. The study also shows companies' preference to collaborate with universities in the educational area. Results can be implied by the project team members for building an effective marketing campaign to extend industry ties.

Keywords: industry-university collaboration, corporate training, andragogy, digital education.

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Lappeenranta, December 2019

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LIST OF ABBREVIATIONS

ANOVA	Analysis of variance
CEPHEI	Cooperative eLearning Platform for Industrial Innovation
HEI	Higher education institutions
IUC	Industry-university collaboration
ISCED	International Standard Classification of Education
MOOC	Massive Online Open Course
OESD	Organization of Economic Co-operation and Development
R&D	Research and Development

1 INTRODUCTION

This chapter introduces the entire research and contains four subchapters, considering background, research objective, research questions and research structure.

1.1 Background

Nowadays, digitalization influence on all sectors and especially on education. The popularity of online courses is growing both among content producers and learners. The audience of Massive Open Online Course (MOOC) platforms reaches millions of people and continue growing every year. Enterprises have a similar dynamic, as a new knowledge appears, they have to train employees and management staff in order to keep the retention rate of employees and compete in the labor market. The most advanced and resource-effective way to develop new skills or onboard employees is to participate in online training. The research compares online training against traditional and in-house corporate training against external.

This research is conducted under the EU ERASMUS + project: Cooperative eLearning Platform for Industrial Innovation (CEPHEI). CEPHEI project is a consortium of nine universities: Lappeenranta-Lahti University of Technology (LUT University), Royal Institute of Technology (KTH), University of Twente (UT), MEF University (MEF), Peter the Great St. Petersburg Polytechnic University (SPbPU), Tomsk State University of Control Systems and Radioelectronics (TUSUR), Gubkin Russian State University of Oil and Gas (GUBKIN), Tianjin University (TJU), Hebei University of Technology (HEBUT). Universities represent 6 different countries: 4 European, Russia and China. The project is aiming to build a community of digital learners from academia and industry. Although one of the main project goals is digitalization of master's degree curricular in Industrial Innovation in consortium universities, great attention is also paid to developing guidelines and recommendations. Recommendations cover course content-related and technological issues. Among them are learning design guidelines, teaching instruction, video laboratories setups and platform development and usage. All courses within the project published on CEPHEI platform require both university and industry stakeholders.

The research topic was derived from project activities in CEPHEI. It brings together academic literature, working experience of the author and knowledge obtained during

master’s studies. The research implies digital education as a bridge between universities and companies.

Firstly, this research is relevant for the project progress as it identifies in which direction a further marketing strategy might be built to attract industry partners. It is limited to Finnish market; however, further study may increase its value. Secondly, the research can be used by corporate training providers as it analyses the readiness of Finnish technological companies to cooperate.

1.2 Research objective

A clear understanding of the research subject cannot be achieved without a holistic analysis of literature on e-learning, corporate training and industry-university collaboration. Therefore, the study addresses industry, university staff and students collaboration in online courses.

1.3 Research question and framework

The main research question is “How different stakeholders can benefit from online courses?”. Based on the main research question three research sub-questions are derived and illustrated in Table 1.

Table 1. Research questions

Research question (RQ)	Goal	Hypothesis
RQ1. Do Finnish companies have corporate training and what channels they use for it?	To identify the preferable channel for corporate training in companies	H1. Finnish companies have corporate training. H2. Finnish companies prefer in-house corporate training. H3. Finnish companies prefer online corporate training.

RQ2. Does form of cooperation between companies and universities depend on the company size?	To provide an analysis on which basis companies cooperate with academia.	H4. Form of cooperation depends on the size of the company.
RQ3. What is the difference in educational approaches on corporate level and master's degree level?	To reveal if the andragogy can be used for teaching master's students.	There is no difference in educational approach for these groups of learners.

A theoretical framework for research questions assessment is illustrated in Figure 1.

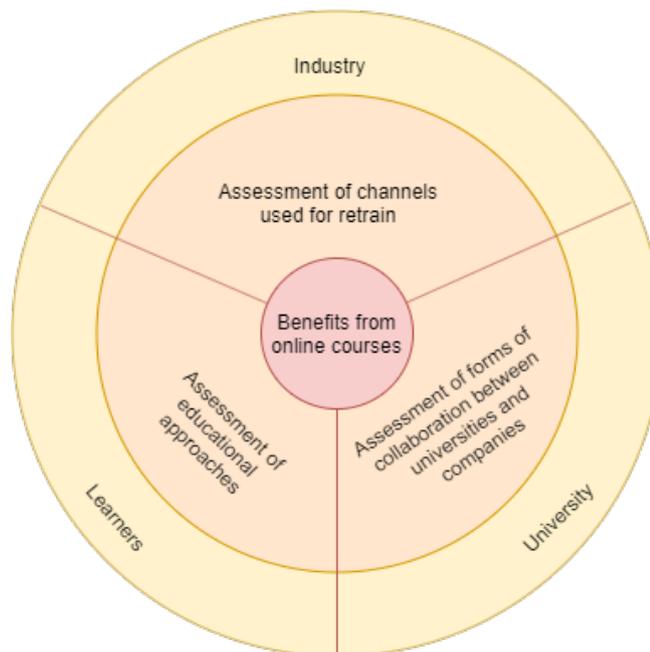


Figure 1. Theoretical framework

1.4 Structure of the thesis

In order to present the results of the research in a clear and comprehensive way, the master's thesis is divided into six chapters. Each chapter of the thesis contributes to answering the

research questions. The structure of the thesis can be presented in a process way, where each element has input and output. The structure of the research is illustrated in Figure 2.

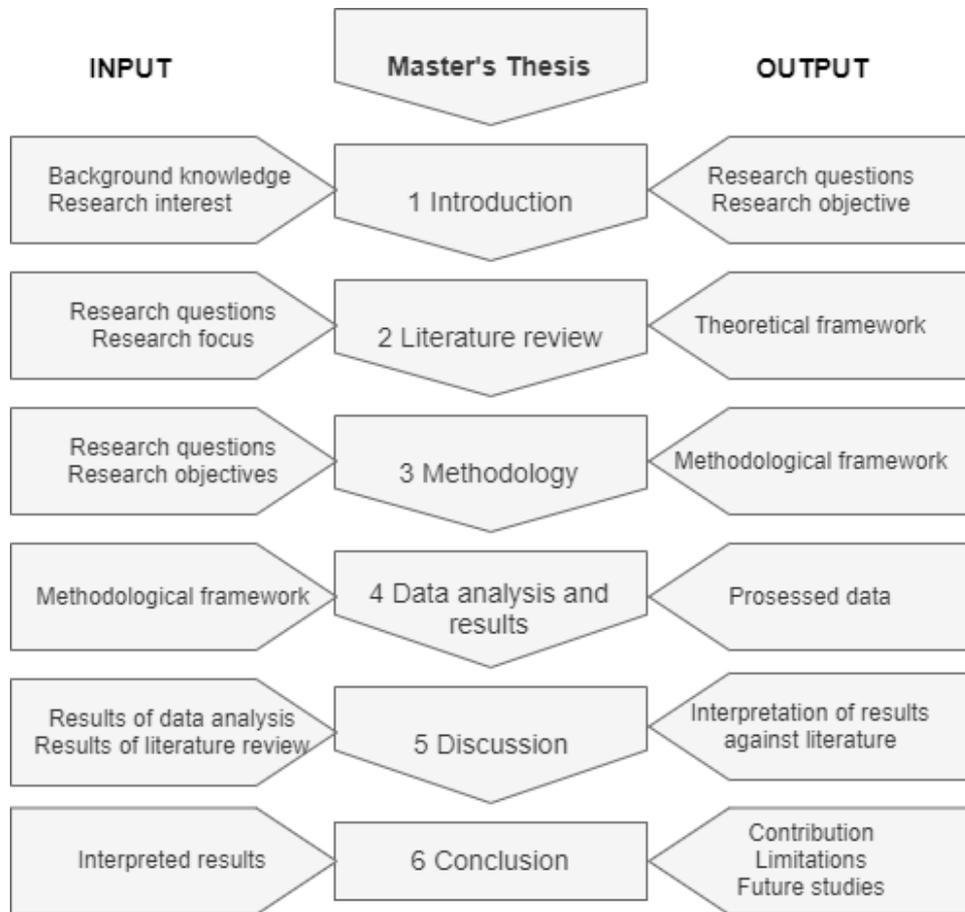


Figure 2. Structure of the thesis

Within the first chapter, the background of the research is provided. Research questions and the objectives are also formulated in the Introduction chapter. The literature review has six subchapters. It provides an overview of the criteria for literature selection, analysis of the literature on main domains and summary where hypotheses for the study are formulated. Literature review chapter is followed by Methodology, which gives a methodological framework. In Data Analysis and Results chapter gathered data has proceeded. It is followed by Discussion where achieved results are compared with academic literature. The conclusion summarises contribution and implementation of the study, discuss limitations and future studies. The list of research materials cited during the work is presented in References chapter. The questionnaire used for data collection is presented in the Appendix.

2 LITERATURE REVIEW

This chapter provides a broad overview of the literature on industry-university collaboration in corporate training. The first subchapter is devoted to literature search strategy. Later, it proceeds to educational approaches and discussion when adult teaching techniques can be applied to students. After that, an introduction to E-learning is given. The chapter continues with a discussion of corporate training ways in terms of place and method. Then it reveals possible cooperation between universities and companies. The chapter is finalized with a summary, where hypotheses for the study are formulated.

2.1 Literature review overview

The purpose of the literature review is to reveal the main concepts and theories of the research topic in order to answer the research questions. The preliminary analysis of search results has shown that there is a lack of studies in corporate training in specific industries, besides medicine. Therefore, the focus is on corporate training in general. The literature search was made in the Scopus database using different keywords and their combination. Thus, the search request is *corporate AND (train* or education or retrain*)*. The initial search provides 11114 results that later were narrowed by applying different filters. Later, articles were filtered by the availability of full text, publication year (from 2009 to 2019). The language was limited to English, the document type was limited to articles and excluded conference papers, reviews, book chapters and books. After this step, the number of available papers was narrowed to 524. Figure 3 illustrates the dynamics of papers published per year available in the Scopus database. The increasing trend in publications means that interest in the topic is growing. However, this trend may be observed in many other subject areas.

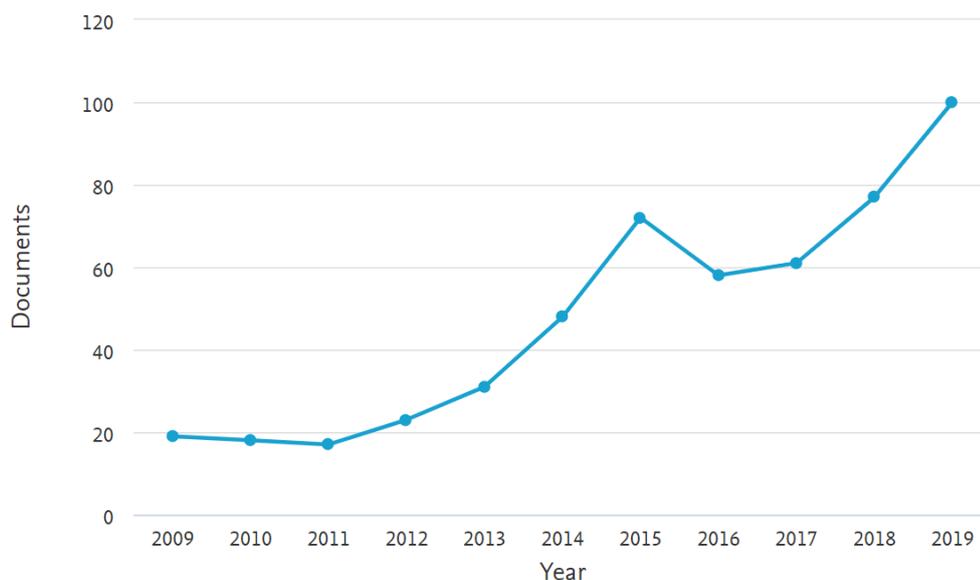


Figure 3. Articles published per year in Scopus database

Following the previous step, the search was narrowed to social sciences and business subject areas excluding medicine, chemistry, mathematics and other irrelevant subject areas. The search results were also narrowed by relative keywords. One of the key criteria for papers selection was the number of citations. The final decision to include paper to the literature review was based on the abstract.

2.2 Educational approaches: pedagogy and andragogy

Prior to diving to corporate education and retraining, the attention is paid to students and different teaching approaches. Often, teachers consider students as children in terms of learning processes, when they just come to university from school. However, on the master's level, adult learners prevail. They already learn to upgrade their career or to develop special skills which respond to company needs. Working with adults is different from working with youth. How people learn has been studied for generations and divided into two groups: pedagogy and andragogy.

Pedagogy is an educational approach that addressing the learning of children (Knowles et al., 2005). Pedagogy studies how children learn and what methodology to use to teach them. The key subject of pedagogical science is an instructor, who makes decisions on what, how and when will be learned, and how the learning process is assessed (Speed et al., 2015).

Thus, pedagogy can also be called instructor-centred learning, as learning depends on teachers and their experience and motivation. However, this approach does not consider the growing up and maturing process of learners, thus, needs of learners are not fully covered. Pedagogy was used as a primary instruction both for adult and children until andragogy theory was proposed in the mid of 19th century and popularized in the 1960s by M. Knowles (Speed et al., 2015).

Andragogy is initially considered as only adults' learning. Needs and motivation of this group of learners differ from children, as being more self-directed. Knowles et al. (2005) propose several basic assumptions to revolve about key comparison points between children and adults. The aspects are the following: self-concept, orientation to learning, readiness to learn, relevance and experience. While in further studies Feltsan (2017) highlights only three aspects: learner's experience, readiness to learn and orientation to learn. Upon these assumptions, four principles of andragogy can be derived: involvement, experience, relevance and problem orientation. The involvement means that learners should be included in the development of their instructions, they must have an active role in what they learn. And this is also relevant for evaluation, adult students need feedback to stay engaged. Adult students bring positive and negative experience as a foundation for learning activities. So, in adult education, a greater emphasis is on learning techniques that rely on experience: case studies, problem-solving, discussions (Edmunds et al., 2002). This helps to understand how given information is relative to their lives. Relevance provides ways of seeing how what they are learning has immediate relevance to and impact on their future career, on their social role or personal life. Adult students learn best when the learning is problem-centred, as they explore the application of methods in real-life cases. A problem-centred approach is preferred to content-oriented. The comparison of pedagogy and andragogy teaching and learning is presented in Table 2. Rogers (2003) argues that there is no difference in how adults and children learn, but there is a difference in how to teach them.

Table 2. Comparison of pedagogy and andragogy

	Pedagogy	Andragogy
The learner	An instructor-centred approach. The learner relies on instructor for all learning process: what, how and when to learn and how to evaluate learning.	A self-centred approach. The learner is responsible for own learning, as decides what is important content. Self-evaluation is a characteristic of this approach.
Role of the experience	The learner comes to the class with little experience. Accept information being presented on the face value.	The learner has considerable experience. Need to validate information based on experience.
Readiness to learn	The learner is guided by instructor on what has to be learned in order to move forward.	The learner gain knowledge for improving the performance in some aspects of working or personal life.
Orientation to learning	Subject-oriented. Content of the course is structured according to the logic of the subject matter.	Problem or task-oriented. The learning is organized around life or work cases, rather than subject theory, as knowledge should have relevance to real life.
Motivation for learning	External motivation.	Internal motivation.

Source: Knowles et al. (2005); Noor et al. (2012); Tasir et al. (2008)

There are several studies that compare the use of pedagogy and andragogy in course delivery. The study conducted by Tasir et al. (2008) supports the idea that undergraduate students prefer a combination of pedagogical and andragogical approaches. This study includes 433 final year undergraduate students, 48,4 per cent of which were from 21 to 25 years. The same result was achieved by Noor et al. (2012) in the case study of 323 undergraduate students who took “Introduction to programming” course as a part of minor studies. 94,7 per cent of respondents aged from 18 to 24 stated that they prefer a combination of pedagogical and andragogical orientation in their learning process. According to Noor et al. (2012 and Tasir et al. (2008) studies, undergraduate students are already problem-oriented and able to work independently, however, they still require instructor’s guidance. Muduli et al. (2018) studied 313 postgraduate students in business schools. The findings support that learners are self-centred, motivated and experience, so andragogical orientation prevails for postgraduates.

International Standard Classification of Education (ISCED) divides educational process into nine levels: 0-early childhood education, 1-primary education, 2-lower secondary education, 3-upper secondary education, 4-post-secondary non-tertiary education, 5-short-cycle tertiary education, 6-bachelor’s or equivalent level, 7-master’s or equivalent level, 8-doctoral or equivalent level (Ec.europa.eu, 2019a). The correspondence of educational levels and applied approaches for education is presented in Figure 4. Education lower bachelor’s level traditionally applies pedagogical approach as learners are children and require instructor guidance. Previous studies state that the teaching process of 18-25 years old students, that refers to the age of bachelor’s level learners, should be both pedagogical and andragogical oriented. While postgraduate students, master’s level and higher, are ready to fully andragogical education.

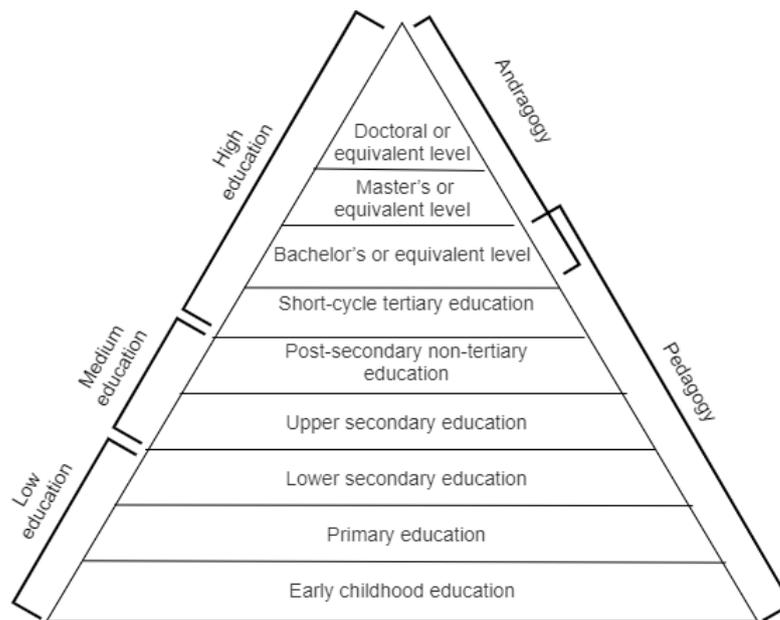


Figure 4. Correspondence of educational levels and applied approaches for education

Source: adapted from Ec.europa.eu (2019a)

For the purpose of the research, only high education (level 5-8) is considered, with a special emphasis on master's level studies (level 7). All further education that happens outside universities (for example corporate education) does not belong to ISCED as education does not result to degree.

In 2019, 35 per cent of enrolled to master's degree programs in Finnish universities students are from 25 to 29 years, while 51,7 per cent of accepted students are over 30 (Vipunen.fi, 2019). These statistics justify why such andragogical teaching methods as a project-based approach and self-study courses are popular in local educational institutions.

2.3 E-learning

Digitalization of education enables cooperation between different organisations including universities. Higher education institutions (HEI) develop an extensive number of online teaching materials that can be used across the borders of the university and foster to open learning environment (Hyvönen, 2019). A growing amount of universities are interested in this digital shift and take actions on courses transition to digital form. Among new "go online" strategies for Finnish universities are online campuses or non-degree online studies (Lut.fi, 2019; XAMK, 2019).

E-learning refers to digital form of education which is available by the use of the innovative technologies, specifically by the Internet (Bond et al., 2018). It is an online delivery of information, communication and training. E-learning gained its popularity because of flexibility in terms of time and geographical location. Due to its ability to cope with the time and distance barriers on the way to knowledge, online learning became a universal tool for individuals and business on-demand learning (Galagan, 2001). Massive Online Open Course (MOOC) revolutionized online learning by letting a large number of users to access online course content mostly free of charge (Vernau and Hauptmann, 2014). The key feature of MOOCs is that they have unlimited access. Starting from the first appearance in the early 2010s, MOOCs popularity was growing fast, and a number of unique users reaches millions of learners worldwide (Table 3). For instance, the edX platform have reached 130 university partners and over 2400 courses in 7 years. Nowadays, the market of online learning is highly competitive and is represented by a dozen of big players and thousands of small. Only four the most famous MOOC platform gather almost a million unique users and over ten thousand courses. However, the quality of material and partner universities differs significantly across platforms (Daniel et al., 2015).

Table 3. The key MOOC platforms

Platform	Partner universities	Courses	Users
Coursera	201	3894	40 mil
Udemy	na	3500	30 mil
edX	130	2400	20 mil
Future Learn	100	420	7.1 mil

Source: Based on data from Coursera (2019), Udemy (2019), edX (2019), Future Learn (2019).

Over the last five years, the interest to MOOC platforms was growing not only from the side of users but also from universities and researches. Only in Scopus database, the number of research papers exceeds three thousand. Studies were conducted to explore different aspects

of MOOCs. Hone and el Said (2016) discuss what factor effect on MOOC's retention rate. Daniel et al. (2015) focus on business model of MOOCs. Another group of researches compares the performance of students in online and traditional courses (Xu and Jaggars, 2014). Most of MOOC's learners already have a university degree or previous higher education studies and aged between 26 and 45 (Daniel et al., 2015). Yukselturk and Top (2013) support this funding with research: 186 students participated in "Computer Systems and Structures" online course were aged from 20 to 51, with an average 28,5. Therefore, online learners are older than normal undergraduate students,

The market of online learning is highly diversified in terms of courses specializations (Figure 5). The highest share of suggested courses belongs to the business and managerial fields (16,8%), the second most popular subject area is science (11,3%). Only 6% of all suggested courses belong to engineering science.

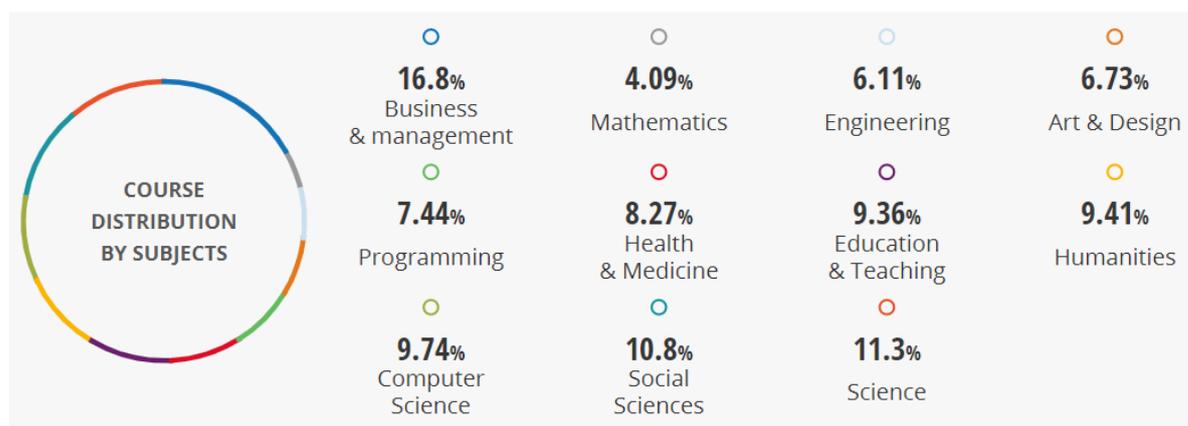


Figure 5. Course distribution by subject

Source: Docebo (2016)

The field of Industrial Innovations is a symbiosis of business and engineering studies. Prior to the start of CEPHEI project the survey of 33 industry partners from Russia, China and Turkey was conducted. The results of the survey supported the key idea of the project – companies are interested in professional development in the field of Industrial Innovation. Russian interviews illustrate interest to Commercialization of R&D results and Marketing of Innovations, Chinese participates select Systematic creativity and TRIZ and Disruptive Innovations courses (CEPHEI, 2019a).

2.4 Corporate education

Annually over four million bachelor's, master's and doctoral level students graduate from European universities (Ec.europa.eu. 2019b). Soon after the graduation most of these learners are joining millions of employees in the European workforce. However, in working life former students continue their education through corporate education, training and lifelong learning.

Corporate education is one of the branches of the educational system and it is completely different from traditional high education. By corporate education, Masalimova and Sabirova (2014) define “a process of professional training, as well as further improvement of specialists’ competencies through multidimensional interaction between education, science and production of a single industry focus”. The objective of corporate training is “to ensure an employee has the knowledge and skills to undertake a specific operation to enable an organization to continue to operate” (Talentlms, 2014). Vernau and Hauptmann (2014) point out that the goal of corporate learning is to change the mindset and behaviour of the workforce. Talentlms (2014) introduces the following main characteristics of corporate learning:

- *Fast-paced.* The training needs to be delivered in a short time and with a maximum result. Any delay in the delivery causes money loss due to lack of knowledge.
- *Career-related.* New skills and knowledge developed during training have to relate to the career path in the company.
- *Benefits company.* The immediate benefit to the company is more important than individual benefit.
- *Training vs education.* Essentially, the industry is interested in training as a way to develop skills. Training has a practical implication to the job duties, while education is mainly theoretical ground.

In their study Masalimova and Sabirova (2014) analyze socioeconomic and educational literature and provide a holistic classification of corporate training according to local scale, temporal and target characteristics. They also classify training on the level of employment in the workplace and the relevance of the study. However, for the purpose of this research,

only the first classification deserves attention. According to local characteristics, training can be in-house and out-of-house.

In-house training is carried out within the company both at the workplace and with separation from working duties. In-house corporate learning can be carried in the following forms: workplace learning, training departments or corporate universities (Lytovchenko, 2016). Workplace learning refers to the simplest form of personal learning, as it does not require additional resources. In such form, employees are learning the job by doing it. The training department is a separate business unit of a company, which task is both the further training of employees and improvement of staff efficiency for achieving the strategic goal of the company. The most advanced and expensive form of in-house corporate training is a corporate university. According to Katkalo et al., (2019) corporate university “is an educational division designed to support a company's strategic development and to be a catalyst for its renewal by training managers and other employees, as well as by creating, accumulating and disseminating advanced knowledge within the organization”. However, Katkalo et al., (2019) contradict with Lytovchenko (2016) in terms of separation of training departments and corporate universities, as both pursue the same goal, but the only difference in the legal status of the division. According to Katkalo et al. (2019), corporate university can be both in the form of a department that aligns with Lytovchenko (2016) about training department and in a subsidiary company. Out-of-house training is a different kind of courses, workshops or seminars conducted out of the company’s territory – in training centres or universities.

A key decision factor whether to outsource corporate training or conduct it in-house is the availability of financial, time and human resources (Crumpton, 2011). Development of in-house training requires high capital costs, human resources with sufficient skills to conduct training and time for organization and implementation. However, internally developed training better fits company culture, it matches enterprise strategy, goals and objectives. Out-of-house training is preferred when the topic is universal and does not require the sharing of sensitive data (Crumpton, 2011). Masalimova et al. (2016.) argue that preference to internal or external training is defined not only by the availability of resources but also by the culture. According to their study, in such European countries’ (as France and UK) companies choose

in-house training, while US businesses go for external learning. There is a lack of research on organizational part of corporate training in Finland, however, according to Organization of Economic Co-operation and Development (OECD, 2018), Finnish small, medium and large enterprises are equally investing in employees training.

It was previously noticed that corporate training is mainly aiming at the development of skills needed now in the company. According to Docebo (2016), the top areas for corporate training are professional and industry-specific skills, compliance and managerial (Figure 6).

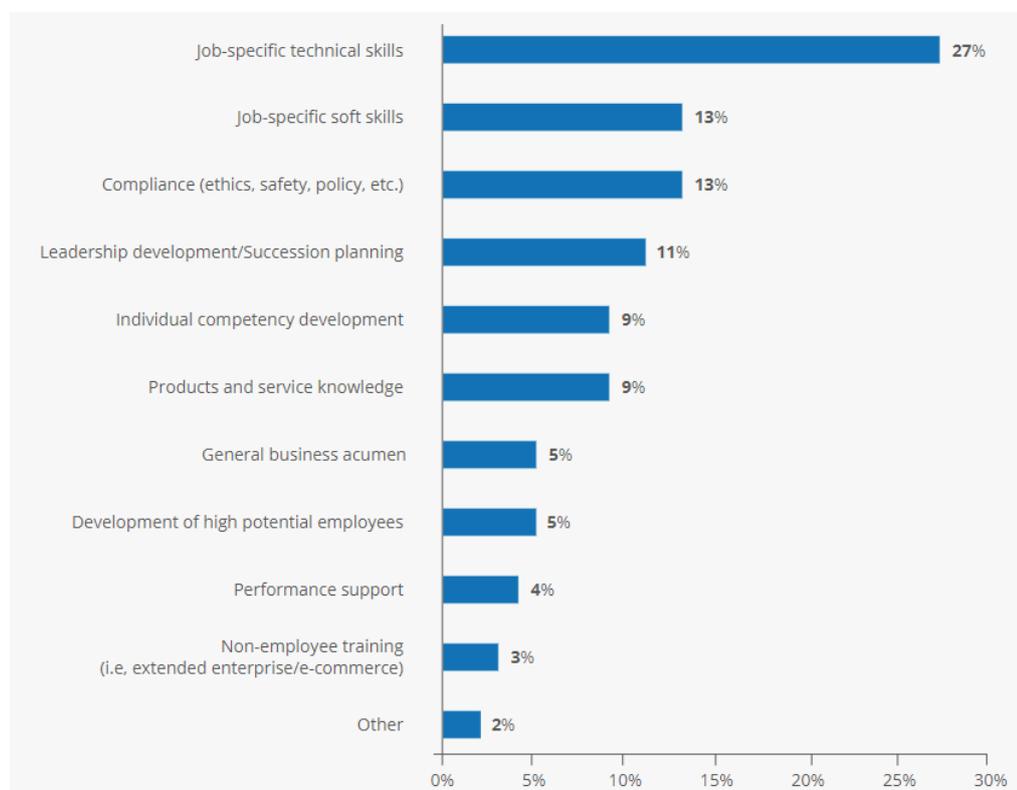


Figure 6. Corporate training by topic

Source: Docebo (2016)

The opportunities offered by online education influence on corporate learning. The learning process and knowledge transfer are integrated in employees working life and helps them to obtain information that is needed and when it is needed. Corporate learning is one of the fastest-growing segments of e-learning market. According to Vernau and Hauptmann (2014) 51 per cent of European companies offers online learning to employees. There are three main motives that accelerate the shift from traditional corporate learning to online: time,

globalization and costs (Lytovchenko, 2016; Vernau and Hauptmann, 2014). With increasing dynamics and complexity of industries, companies tend to formulate short-term strategies. Since such agility to the environment is a key of the success and competitive factor, the training for staff should be offered in a short time on parallel with job performance. Companies are growing globally, open branches in new locations and markets, thus, corporate learning needs to follow the speed of a company's development and be equally available worldwide. The last but not the least in terms of importance is cost pressure. Companies try to avoid financial burden associated with employees training. Thus, employees are forced to perform daily tasks, build portfolio and develop competences with learning opportunities at the same time. The costs for trainers, travel and infrastructure for face-to-face training influence on the demand for corporate e-learning (Vernau and Hauptmann, 2014).

According to the forecast prepared by Docebo (2016), the market of corporate e-learning will continue to grow minimum for the next two years. Technavio (2018) also forecasting the growth of corporate e-learning training by 15 %.

2.5 Industry-university collaboration

Since 1980s universities have focused on the development of skills that undergraduate and graduate students require for employment (Wilson, 2012). Today, there is a high level of competition among universities. Consequently, more and more universities adopt a market orientation strategy in order to make timely improvements in connection with students' requirements and desires (Machado et al., 2011). There is an adaptation of proposals from universities in connection with the needs of business and of students' demand for employment. The development of employment skills of students required for the shift into industrial roles are viewed as fundamental (Jackson, 2015). Williams et al. (2013) point that collaboration between industry and universities is initiated by HEI and focused on having closer interaction with industry.

There is a number of advantages in industry-university collaboration (IUC) for both parties. Business benefits from highly qualified researchers, access to technologies and knowledge and expensive research infrastructure (Ankrah and AL-Tabbaa, 2015; Myoken, 2013). In

return, HEIs profit from industrial equipment and laboratories, additional funding for research and licensing and patent activity (Bodas Freitas and Verspagen, 2017; Rybnicek and Königgruber, 2019). IUC and international funding are the main sources of finance for universities in many countries. However, in Finland 80 per cent of total university funding comes from general university funds and direct government funding (OECD, 2018). The core idea of CEPHEI project is to link universities and companies, that create mutual benefits (Figure 7). To meet the needs of HEIs represented by university staff and students, industry and society. CEPHEI project brings together “innovations in industry, links universities and industry, promotes a blended learning approach and a freemium model of education” (CEPHEI project, 2019).

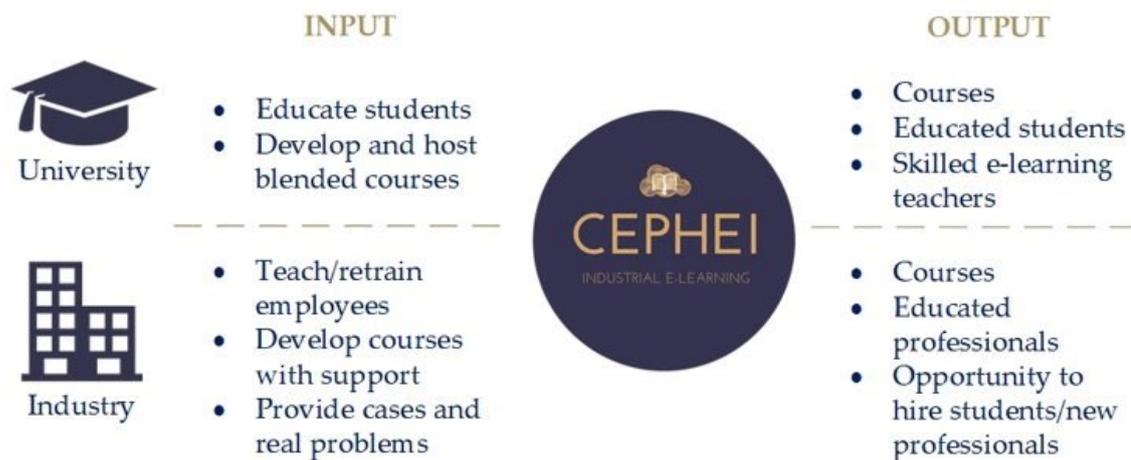


Figure 7. Inputs and outputs of CEPHEI Project

Source: CEPHEI Project, (2019)

Nowadays, a collaboration between universities and companies happens on the number of grounds. All cooperative activities can be grouped into four areas: education, research, valorization and management (Davey et al., 2018). Education includes joint activities from curricular design and delivers to lifelong learning of company staff, for example, executive training, professional courses and industry training. Research area includes joint or financed research and development, mutual staff mobility. Valorization refers to commercialization of R&D and academic and student entrepreneurship. Cooperation in the research area, followed by the education area the most developed forms of IUC in Europe (Davey et al., 2018). Following this classification, CEPHEI project suggests four forms of cooperation

within the project. Three of these forms refer to education activities: “to delegate retraining to the platform”, “to outsource cases and problems to platform learners” and “to publish own courses”, and one refers to management area: “to hire employees among successful students” (CEPHEI, 2019).

2.6 Summary of literature review

The modern academic literature actively investigates background of educational process in terms of approaches, methods and cooperation strategies between different stakeholders. However, there is a significant lack of Finnish education market research, especially in the field of corporate training. Thus, the following hypotheses are formulated for this research:

H1. Finnish companies need corporate training.

Finnish small, medium and large companies equally invest in staff development (OECD, 2018). Thus, it allows to assume that Finnish companies need and provide training to employees, but the share is not known.

H2. Finish companies prefer in-house corporate training.

French and UK enterprises mostly prefer to conduct in-house corporate training, that explained by availability of local financial, human and time resources and unwillingness to share sensitive information (Masalimova et al., 2016), while in the contrast US companies prefer external training. As Finland belongs to the group of European countries, that allows assuming that Finnish enterprises also prefer in-house corporate training.

H3. Finnish companies prefer online corporate training.

51 per cent of European companies offered online learning to employees (Vernau and Hauptmann, 2014). Thus, Finnish companies might prefer online corporate training to traditional.

H4. Form of cooperation with CEPHEI project depends on the size of the company.

Regarding the fact that Finnish companies equally invest in corporate training, it might be assumed that large and medium enterprises would prefer cooperation in education area, while small in management.

3 METHODOLOGY

In the previous chapter, a comprehensive literature review is provided. This research aims to identify differences in types of corporate training performed in Finnish companies according to sizes. It also aims to identify patterns or differences in forms of cooperation between companies and CEPHEI project. The study utilizes a structured questionnaire survey.

The forms of retraining in companies were discussed in several articles, for example, Crumpton, (2011); Masalimova et al., (2016). A primary data was collected with a questionnaire. The collected data includes companies' characteristics, forms of retraining in Finnish companies and readiness to participate in CEPHEI project. The questionnaire used for research data collection is presented in Appendix 1.

3.1 Research design

As Saunders et al. (2016) claim that questionnaire is the most commonly used method for the data collection with the survey strategy. It is an objective method for testing hypotheses; however, the design of the questionnaire may effect on response rate and reliability of the data. To assure the reliability of results, the questionnaire adopts Crumpton, (2011); Masalimova et al., (2016) studies and the context of CEPHEI project.

Prior to the main survey, pilot testing was conducted to ensure the significance of questions and their relevance to the survey. The survey was prepared in two languages: English and Finnish. The questionnaire was firstly drafted in English and translated to the Finnish language by a native Finnish speaker. Later, the Finnish version was translated back to English by another native Finnish speaker to examine the correctness of translation and verify that meaning is the same. The pilot survey was discussed with researchers from Industrial Engineering and Management department asking for feedback on the structure, that it is comprehensive and clear for respondents from one side, and data would answer research questions from the other side. It was decided to use both English and Finnish versions of the survey as during the preliminary set of contacts with Finnish companies, the response rate was less than 5%. The survey was prepared in Google forms.

The questionnaire consists of four main parts. The first part is introduction to the research, it explains objectives of the research. At the second part respondents are asked about company's details, such as size, presence and absence of corporate training in the company. The third part deals with questions related to different forms of training and invites respondents to rate frequency of them using five-point Likert scale ranging from 1 "not used at all" to 5 "the main form of retraining". The last part includes a description of CEPHEI project and asks respondents to answer whether they would like to participate in such project and in what form. In total, the survey includes 10 questions.

3.2 Sampling and data collection

The survey for this research was conducted among industrial Finnish companies. To identify potentially suitable companies the list of member companies of Technology Industries of Finland Association was used (Technology Industries, 2019). Initially, it included 1400 companies, however, several large and medium companies were mentioned several times because of having separate offices for different functions. After removing repeating lines and international companies that have an office in Finland only for export, 1161 unique companies have left. At the next step, 20 per cent of companies presented in the list were randomly chosen for obtaining contact information. Only 232 companies were selected due to high time consumption for contact information collection. The target group of the survey is HR managers and managing directors.

Later, an email with covering letter explaining the purpose of the survey and inviting to participate was sent to potential respondents. For emailing Mailchimp marketing platform was used, as it not only fastens the process but also provides some statistics on the campaign. 9 emails were not delivered and for 19 emails an automatic response informed that potential respondent is no longer work in the company or currently on a business trip with limited access to the internet. Thus, the eligible sample size is 204. 42,3 per cent of reached contacts have opened an email and 17,6 per cent have clicked on the link. 96,3 per cent of respondents opened an email from Finland, that means the target group – Finnish enterprises – was reached. One email with a reminder was sent to potential respondents within a week. Finally, 32 surveys were completed with an effective response rate of 15,6 per cent. The sample is

considered representative, as an average response rate for web surveys outside one company is approximately 15 per cent (Saunders et al., 2016).

4 DATA ANALYSIS AND RESULTS

In the following chapter, the collected data sample is analyzed with data analysis and statistical software - STATA SE16, preliminary data was manually encoded in Excel. The summary information on how values of variables were encoded is presented in Table 4.

Table 4. Values of variables

Variable	Value	Code
Language	English	1
	Finnish	2
Size	Small	1
	Medium	2
	Large	3
Corporate training	No	0
	Yes	1
Attitude to CEPHEI project	No	0
	Yes	1
Form of collaboration	To delegate a retraining to the platform	1
	To outsource cases and problems to platform learners	2
	To publish own courses	3
	To hire employees among successful students	4
	I am not interested in collaboration	5

As the survey was conducted both in English and Finnish languages, the results were combined in one document. The distribution between respondents according to the preferred language is illustrated in Figure 8. As can be seen, the decision of using both languages was rational, as 53,13 per cent of respondents preferred Finnish to English.

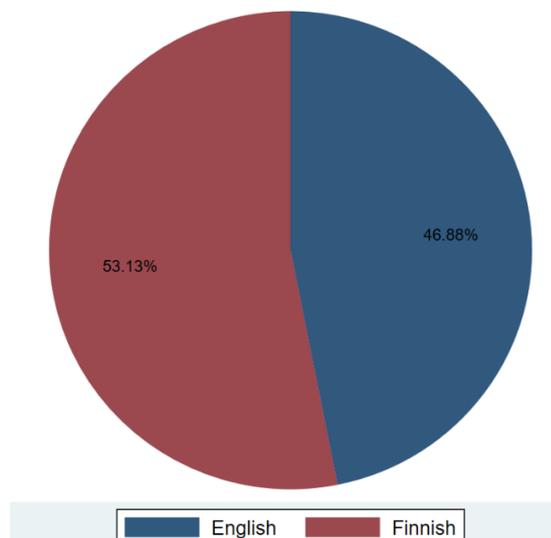


Figure 8. Distribution of language preferences

Two respondents or 6,25 per cent state that they do not have corporate training in the company (Figure 9). While the majority indicates that they have corporate training at any of forms. Negative answers were not removed from the data sample, due to relatively small sample size and as respondents also later indicated interest to CEPHEI project and chosen a preferable form of cooperation.

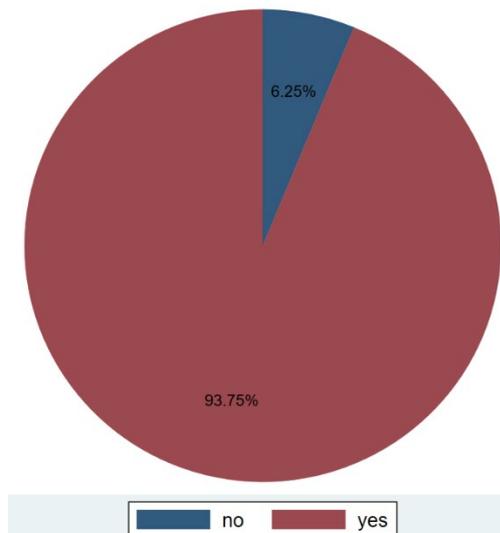


Figure 9. Distribution of corporate training activity in companies

In this chapter first, the descriptive statistics of the dataset is provided. Next, the correlation analysis is performed. After that, a one-way ANOVA aimed to answer the research question is performed. And finally, cluster analysis is conducted.

4.1 Descriptive statistics

This subchapter focuses on the basic characteristics of the collected primary data. It describes basic information about companies and frequency, variation and dispersion of parameters.

Table 5 presents the profile of companies participated in the survey. Majority of the respondents (55,00%) represent medium size companies. Small and large companies are equally represented (25,00%). Figure 10 shows a graphical illustration of respondents' distribution between different size groups of companies.

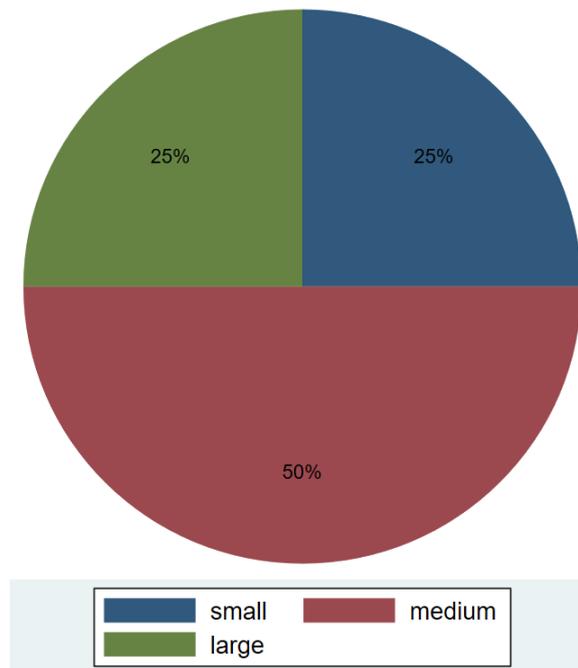


Figure 10. Distribution of companies according to size

Table 5. Characteristics of companies

Company size	Frequency	Percent	Cumulative
Small	8	25,00	25,00
Medium	16	50,00	75,00
Large	8	25,00	100,00

The descriptive statistics for parameters later analyzed in this research is presented in Table 6. The number of observations is 32 and it is equal for all parameters, that means there were no missing variables, that require additional coding. The correctness of manual data coding and preparation is ensured by minimum and maximum values, as all observations are within range.

Table 6. Descriptive statistics of factors

Variable	Obs.	Mean	Std. dev.	Min	Max
Size	32	2	0,718	1	3
Corporate training	32	0,938	0,246	0	1
Internal face-to-face training (organized by HR or training department)	32	3,438	1,134	1	5
External face-to-face training (conducted by an expert or influencer from outside of your company)	32	2,812	1,203	1	5
Internal online training (organized by HR or training department)	32	2,5	1,391	1	5
External online training developed by university for the needs of your company	32	1,219	0,491	1	3
External online training developed by an expert/influencer/other company for the needs of your company	32	2,563	1,076	1	5
External online training at massive online open courses (MOOCs), f.e. Coursera, Udemy, LinkedIn	32	2,563	1,318	1	5
Willingness to cooperate with CEPHEI Project	32	0,969	0,177	0	1

Form of collaboration with CEPHEI	32	2,344	1,382	1	5
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Respondents evaluate “internal face-to-face training” higher than other types of training with mean 3,438, that means this type of corporate training is used more often. The second popular option is “external face-to-face training” with mean 2,812, so comparing with different kinds of online options for education, companies still prefer traditional forms. The lowest interest and applicability is indicated to “External online training developed by university for the needs of your company” with mean 1,219 and as standard deviation is low (0,491) answers are closely clustered around the mean.

As can be seen from Figure 11 that presents a visualization of factors results, some factors are skewed to the right: “Internal face-to-face training (organized by HR or training department)”, “Internal online training (organized by HR or training department)” and “External online training at MOOCs”) as boxed are divided into unequal pieces and data is above median. The variable “External face-to-face training (conducted by an expert or influencer from outside of your company)” is symmetrically distributed. However, as can be seen from the graph, there are outlier for variables “Internal face-to-face training”, “External online training developed by university for the needs of your company” and “External online training developed by an expert/influencer/other company for the needs of your company”. Outlier values are far from the mean, so they might have a negative effect by giving incorrect estimates of distribution parameters. Normally, such outlier should be removed. However, in this research, as each answer is highly important for the purpose of the research due to relatively small sample size they are kept.



Figure 11. Distribution of factors

Respondents are mainly interested in collaboration with the project or organization that is ready to suggest courses developed by universities in collaboration with companies (Figure 12). 93,75 percent of respondents marked their interest to CEPHEI Project, and only two (6,25%) stated that they are not interested. However, only one of these two later stated full uninterest to the project, but the other one has chosen a suitable form of collaboration.

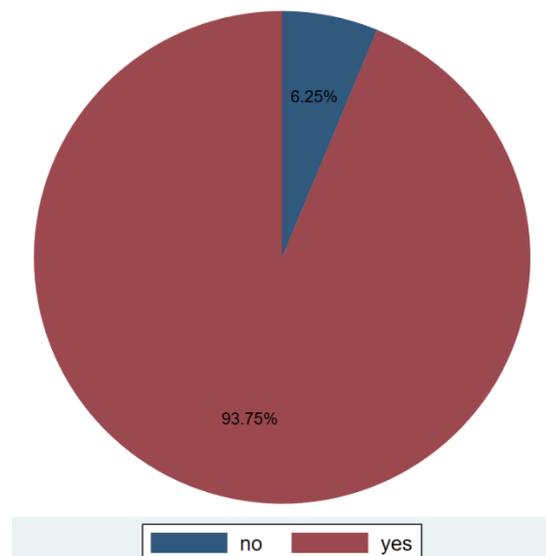


Figure 12. Distribution of interest to CEPHEI Project

Distribution of answers in forms of collaboration is illustrated in Figure 13. The respondents (37,5%) mostly would like to delegate a retraining to CEPHEI Project. It is followed by the option “to outsource problems and cases to platform learners” (28,13%). Every third company would like to receive external ideas for developing their business. A great interest was also indicated to “hiring employees among successful learner” (25%) that in its turn shows the passive interest to data analytics in general, and learning data analytics in particular. The least popular option of collaboration is through publishing own courses of company, this option was chosen only by one company (3,125%).

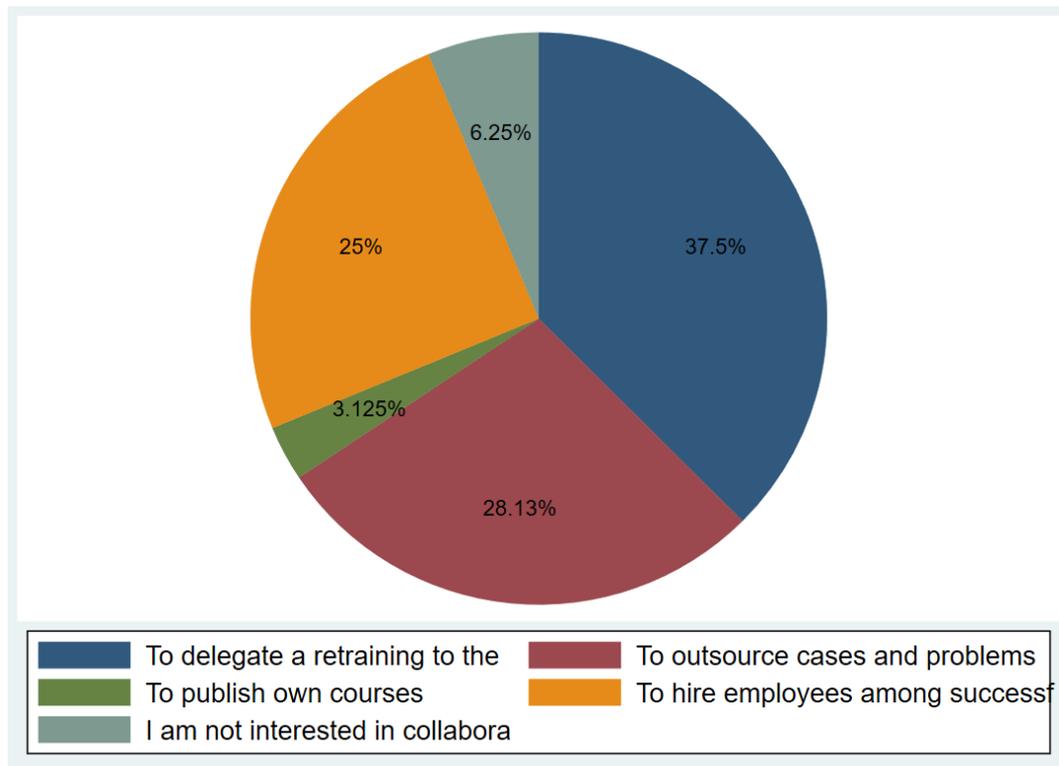


Figure 13. Distribution of forms of collaboration with CEPHEI Project

4.2 Paired t-test

Aiming to compare companies corporate learning activity in terms of preferred form four new variable were generated as an average of included components (Table 7).

Table 7. Generation of new variables

Variable	Label	Components
internal	Internal corporate training	Internal face-to-face training (organized by HR or training department) Internal online training (organized by HR or training department)
external	External corporate training	External face-to-face training (conducted by an expert or influencer from outside of your company)

		<p>External online training developed by university for the needs of your company</p> <p>External online training developed by an expert/influencer/other company for the needs of your company</p> <p>External online training at massive online open courses (MOOCs)</p>
trad	Face-to-face corporate training	<p>Internal face-to-face training (organized by HR or training department)</p> <p>External face-to-face training (conducted by an expert or influencer from outside of your company)</p>
online	Online corporate training	<p>Internal online training (organized by HR or training department)</p> <p>External online training developed by university for the needs of your company</p> <p>External online training developed by an expert/influencer/other company for the needs of your company</p> <p>External online training at massive online open courses (MOOCs)</p>

Table 8 represents a descriptive statistic for new generated variables as an average of the components included. The number of observations has not changed and equal to 32, that means all observations were counted. The mean value is for internal corporate training (2,969) is higher than to external (2,289), that means in average the higher score were given

to the components that forming “internal corporate training”. The same result is observed for mean values of traditional corporate training (3,125) and online (2,211).

Table 8. Descriptive statistics of new variables

Variable	Obs.	Mean	Std. dev.	Min	Max
internal	32	2,969	0,949	1	5
external	32	2,289	0,603	1	5
trad	32	3,125	0,898	1	5
online	32	2,211	0,654	1	5

The generation of new variables also allowed to eliminate the possible negative effect of outliers to the result (Figure 14). Variables are mostly symmetrically distributed.

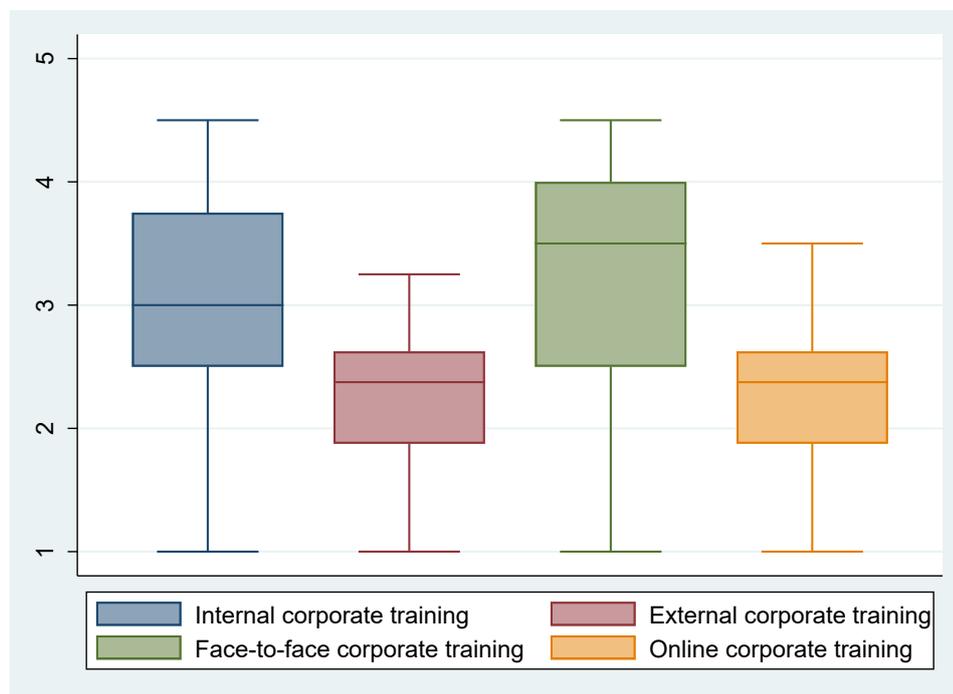


Figure 14. Distribution of new factors

Paired t-test, also known as “dependent” t-test is used when where is an assumption that observations are not independent of each other. In the case of this research, is expected that

there is a relationship between internal and external corporate training and between traditional and online corporate training. By applying paired t-test, the differences in values for each of two variables and if the mean difference is equal to zero is tested for each respondent. The following hypotheses are formulated for the test:

H1₀. There is no statistically significant difference in mean values across each respondent for variables “internal corporate training” and “external corporate training”.

H1₁. There is a statistically significant difference in mean values across each respondent for variables “internal corporate training” and “external corporate training”.

H2₀. There is no statistically significant difference in mean values across each respondent for variables “face-to-face corporate training” and “online corporate training”.

H2₁. There is a statistically significant difference in mean values across each respondent for variables “face-to-face corporate training” and “online corporate training”.

The results of the paired t-test are presented in Table 9.

Table 9. Paired t-test

Pair	Mean	Std. dev.	t	df	p-value (T < t)	p-value (T > t)	p-value (T > t)
Internal - external	0,6797	1,0419	3,6902	31	0,9996	0,0009	0,0004
internal	2,9688	0,9499					
external	2,2891	0,6027					
Face-to-face - online	0,9141	1,0656	4,8524	31	1,0000	0,0000	0,0000
face-to-face	3,1250	0,8980					
online	2,2109	0,6541					

According to the results, H_{10} is rejected as two-tail p-value (0,0009) is below 0,05. There is a significant difference in scores for internal (M=2,97; SD=0,95) and external (M=2,29; SD=0,60) corporate education. H_{20} is also rejected as two-tail p-value (0,0000) is below 0,05. There is a significant difference in scores for face-to-face (M=3,13; SD=0,90) and online (M=2,21; SD=0,65) corporate education.

4.3 Correlation analysis

In this subchapter the correlation between variables is measured. Correlation refers to the degree of relationship between two variables. Commonly Person's correlation and Spearman's rank correlation tests are used for measuring the correlation between variables. The Person's correlation test can't be used for analyzing the sample, as according to the first assumption, variables should be measured on continues way. As variables are measured on an ordinal scale (Likert scale from 1 to 5) Spearman's correlation test is used instead. The other point for Spearman's correlation is that it is not sensitive to outliers, that is regarded as another argument for this test, as in previous subchapter the decision to keep outliers was made.

Spearman's rank correlation is a nonparametric test that measures the strength and direction of association between variables that measured on a Likert Scale. There are two assumptions for Spearman's rank, if any of them is not met, analyzing data might not lead to valid results. Firstly, variables should be measured on ordinal or continuous scale. As have been mentioned variables are measured on Likert scale that refers to ordinal. Secondly, there need to be monotonic relationships between variables.

A Spearman's rank correlation is tested in order to identify relationships between different forms of retraining performed in companies. Results of Spearman's rank correlation between variables are presented in Table 7. As can be seen, the correlation between variables is mainly small and positive. Between some variables, a negative correlation is observed, but relations are weak. The moderate positive correlation (0,3481) is observed between "External face-to-face training" and "External online training developed by the university for the needs of your company", that might mean that companies inviting external expert for lecturing more likely prefer online training developed by universities. Because variables are

low correlated between themselves, and none of them explains any other variable, it is irrelevant to use data reduction techniques.

Table 10. Spearman's rank correlation

Spearman's rank correlation	Internal face-to-face training	External face-to-face training	Internal online training	External online training developed by university	External online training developed by an expert/ influencer/ other company	External online training at MOOCs
Internal face-to-face training (organized by HR or training department)	1					
External face-to-face training (conducted by an expert or influencer from outside of your company)	0,1511	1				
Internal online training (organized by HR or training department)	0,0998	0,0945	1			
External online training developed by university for the needs of your company	0,0093	0,3481	0,0934	1		
External online training developed by an expert/influencer/other company for the needs of your company	-0,0535	0,2575	0,2300	0,1515	1	
External online training at massive online open courses (MOOCs)	-0,1479	0,0232	0,2012	-0,1133	0,1151	1

4.4 ANOVA analysis

The one-way analysis of variance (ANOVA) is performed in order to determine if the mean value for the variable “form of collaboration with CEPHEI project” differs across the size of company (three independent groups). The following assumptions are satisfied for ANOVA test: the independent variable size is a categorical variable; the independence of observations is achieved as no respondents are assigned to more than one group (a form of collaboration); there is no significant outliers. Before running the ANOVA test the following hypotheses were formulated:

H3₀: There is no statistically significant difference in the preferred form of collaboration with CEPHEI project between different size of companies.

H3₁: There is a statistically significant difference in the preferred form of collaboration with CEPHEI project between different size of companies.

The results of ANOVA are illustrated in Table 10.

Table 11. ANOVA analysis of variance 1

	Sum of squares	Degree of freedom	Mean square	F value	P value
Between groups	0,34375	2	0,171875	0,08	0,9191
Within groups	58,875	29	2,030172		
Total	59,21875	31	1,91028226		

A one-way ANOVA is conducted to compare the form of collaboration depending on the size of company. According to results, the significance level is 0,9191 ($p=0,9191$), which is above 0,05. Therefore, we fail to reject H3₀ and have to reject H3₁ and confirm H3₀. Thus, there is no statically significant difference in the preferred form of collaboration with CEPHEI project between different size of companies.

The second time ANOVA analysis was run in order to identify the difference in the decision to have a corporate training among companies with different size. The results of the test are performed in Table 12. The following hypotheses were formulated:

H4₀: There is no statistically significant difference in the decision to invest in corporate training between different size of companies.

H4₁: There no statistically significant difference in the decision to invest in corporate training between different size of companies.

Table 12. ANOVA analysis of variance 2

	Sum of squares	Degree of freedom	Mean square	F value	P value
Between groups	0,0625	2	0,03125	0,50	0,6117
Within groups	1,8125	29	0,0625		
Total	1,875	31	0,06048		

According to results, the significance level is 0,6117 ($p=0,6117$), which is above 0,05. Therefore, we fail to reject H4₀. Thus, there is no statically significant difference in decision to invest in corporate training between different size of companies.

4.5 Cluster analysis

Cluster analysis is a statistical technique for dividing data into clusters based on similarities and differences of variables. The variety of clustering techniques allow to achieve different results. For the purpose of this research a k-means clustering is applied which is based on mean values of variables. During k-means clustering each observation might belong only to one cluster. In this subchapter cluster analysis of observations is performed based on the forms of corporate training. The analysis starts with visual search for patterns (Figure 15). Unfortunately, scatterplot does not indicate that there might be any patterns in observations.

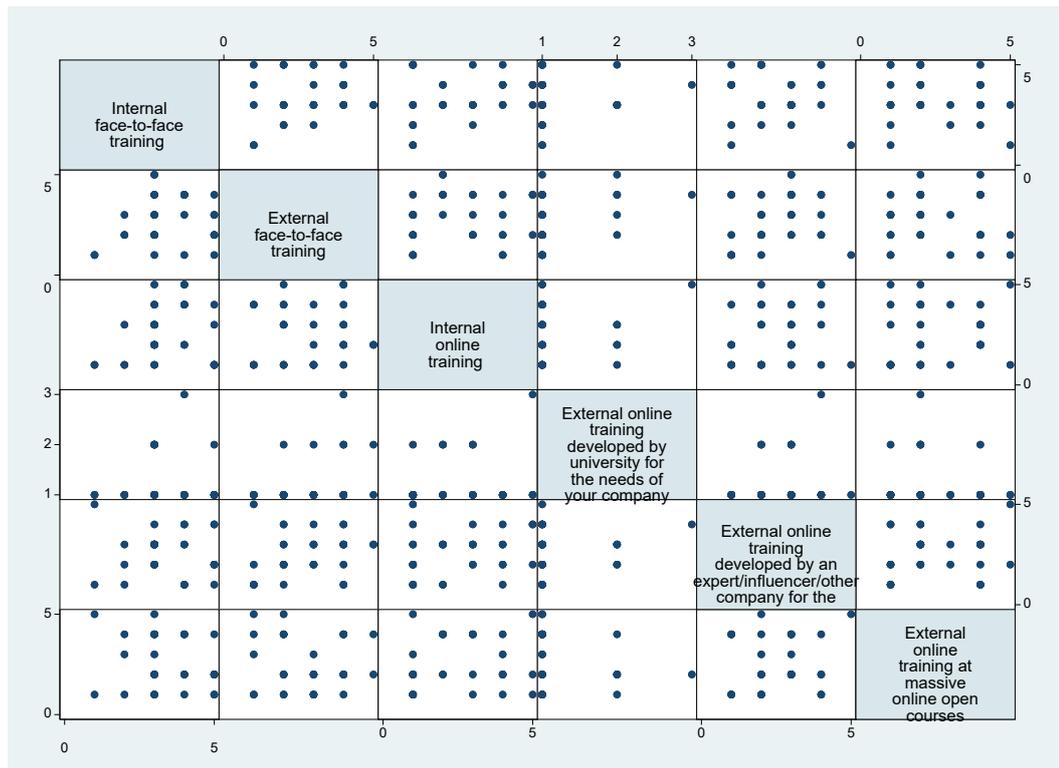


Figure 15. Scatterplot

However, there is a more reliable way to cluster observations. To choose the right clustering number a stopping rule is applied. There are two the most popular rules that are applied for identification of clusters numbers: Calinski–Harabasz pseudo-F index stopping rule and Duda–Hart $Je(2)/Je(1)$ index stopping rule. The results of both tests are presented in Table 13.

Table 13. Calinski–Harabasz and Duda–Hart indexes

Number of clusters	Calinski / Harabasz pseudo-F	Duda/Hart	
		$Je(2)/Je(1)$	Pseudo-T-squared
2	8,14	0.7139	6.41
3	8,17	0.6731	5.34

4	8,13	0.6820	5.59
5	8,33	0.5325	5.27
6	9,14	0.5479	5.78
7	9,69	0.6189	3.08
8	9,57	0.5250	4.52
9	9,61	0.2381	9.60
10	9,55	0.5000	3.00
11	9,64	0.5787	2.18
12	9,54	0.0000	0,00
13	9,60	0.5667	2.29
14	9,81	0.4267	2.69
15	9,94	0.3214	2.11

The recommended number of clusters correspond to the highest number of pseudo-F or to the lowest number of pseudo-T-squared. The highest number of Calinski–Harabasz index corresponds to 15 clusters, the lowest number of Duda-Hart index corresponds with 12 clusters. Clustering to 12 or 15 groups will not provide a reliable and representative results as each group will on average include 2-3 observations. The insufficient result is caused by relatively small sample size.

5 DISCUSSION

In this chapter, the results are discussed and compared with literature findings. To ensure a broad answer to each research question, every question and hypothesis are discussed separately.

RQ1. Do Finnish companies have corporate training and what channels they use for it?

Corporate education does not refer to official classification of educational levels, as it does not lead to new degree (Ec.europa.eu, 2019). However, former students continue their educational path in industry to follow changing business environment and stay as valuable human resources for the company. The objective of corporate training is to provide specific knowledge and skills to employees that will facilitate further operation activity and growth of the enterprise (Talentlms, 2014). While HEIs understand the need for development of employability skills of alumni, still provide mainly subject-based education (Wilson, 2012). Thus, corporate training was historically developing separately from higher education.

Academic literature discusses corporate training in general but does not focus on the issue if companies have it or not, and to what extent. Finnish market is less studied in all aspects. However, there is a point that Finnish small, medium and large companies equally invest in staff development (OECD, 2018). According to achieved results, out of 32 Finnish companies that participated in the study 93,75 per cent provide corporate training. Thus, the hypothesis *H1. Finnish companies have a corporate training* is approved. Moreover, the study continued to assess if the decision to have a corporate training depends on the size of the company. According to the results of ANOVA analysis, the significance level is 0,6117 ($p=0,6117$), which is above 0,05. That means there is no statically significant difference in decision to invest in corporate training between different sizes of companies. So, achieved results aligns with the theory.

The channels for corporate training can be classified based on a number of different grounds. In this research, the attention was focused only on local and instrument characteristics. According to local characteristics, training can be in-house and out-of-house (Masalimova

and Sabirova, 2014). In-house or internal corporate training takes place within the organization and is organized by the use of internal resources, for instance by HR or training department. Out-of-house or external corporate training utilizes intellectual resources of the external environment. It is conducted by an expert or influencer from outside of the company. French and UK enterprises mostly prefer to conduct in-house corporate training. It is explained by the availability of local financial, human and time resources and unwillingness to share sensitive information (Masalimova et al., 2016). While in contrast, US companies prefer external training. Finland being a European country allows to assume that Finnish enterprises also prefer in-house corporate training. The study utilizes paired t-test to compare means for in-house and out-of-house forms of corporate training. According to the results, with two-tail p-value = 0,0009, there is a significant difference in scores for internal (M=2,97; SD=0,95) and external (M=2,29; SD=0,60) corporate education. The mean value for internal training higher than means companies more often use this channel. Thus, the hypothesis **H2**. *Finish companies prefer in-house corporate training* is approved.

Another classification supposes diversification of corporate training according to instruments used for its delivery. Training can be face-to-face or online. 51 per cent of European companies offer online learning to employees (Vernau and Hauptmann, 2014). The study utilizes paired t-test to compare means of traditional and online corporate training. According to results, two-tail p-value = 0,0000. This means that there is a significant difference in scores for face-to-face (M=3,13; SD=0,90) and online (M=2,21; SD=0,65) corporate education. The mean value for traditional training is higher. Therefore, so Finnish companies prefer face-to-face training to online, that contradicts with academic literature. Thus, the hypothesis **H3**. *Finnish companies prefer online corporate training* is declined. Observation clustering and pattern identification was conducted in order to determine if a company with a preferred form of training would discard other options. However, at the stage when the number of clusters should be decided, the decision not to continue analysis was made due to high number of optimal clusters.

RQ2. In which forms companies can cooperate with universities for corporate training?

Nowadays, cooperation between universities and companies happens on a number of grounds: education, research, valorization and management (Davey et al., 2018). The most popular reason for cooperation in Europe is research, followed by the education area (Davey et al., 2018). This study aims to identify which reason is the most preferable for companies to cooperate with CEPHEI project. CEPHEI project provides master's level courses developed in cooperation with academia and industry. The project suggests four forms of cooperation, three of them refer to the education area and one to management (CEPHEI, 2019).

The results of the study show that companies prefer cooperation in the educational area. The majority of Finnish companies participated in the research (37,5%) would like to delegate retraining to CEPHEI project. This means that they would like to save money spent for corporate education by choosing a channel for nonunique mass education. Every third company (28,13%) would like to receive external ideas for business development through “outsource problems and cases to platform learners”. Great interest was also indicated to management area. Every fourth company (25%) interested in “hiring employees among successful learner”. That, in turn, shows the passive interest to data analytics in general and learning data analytics in particular. The least popular option of collaboration is through publishing company's courses. Reasons for the low interest maybe unwillingness to share sensitive data or distrust to the data security of the platform. Companies might also have courses that are too specialized to be interesting to other learners. The study continued with testing the hypothesis that the form of collaboration depends on company size, for example, large and medium companies would more likely prefer delegating retraining to the platform. Meanwhile, small companies would prefer to outsource cases and problems. A one-way ANOVA was conducted to compare the preferred forms of collaboration depending on the size of the company. According to the results, the significance level is 0,9191. Therefore, there is no statically significant difference in the preferred form of collaboration with CEPHEI project between the different sizes of companies. Hypothesis **H4**. *Form of cooperation with CEPHEI project depends on the size of the company* is declined.

RQ3. What is the difference in educational approaches on corporate level and master's degree level?

This question arises as CEPHEI project brings together master's level students and employees at one platform. It is important to ensure that the same educational approaches can be used for both groups of learners. The answer to this question is based on the literature review. Educational approaches can be pedagogical and andragogical. The distinctive feature of andragogical approach is that it is instructor-centered and subject-oriented (Knowles et al., 2005). While the andragogical approach is learner-centered and problem-oriented. The decision to study is motivated by learner's internal willingness and understanding of the future application of this knowledge. Undergraduate students from 18 to 24 years still have a lack of internal motivation and experience to proceed with studies without supervision (Noor et al., 2012; Tasir et al., 2008). However, graduate students that refer to master's level and PhD are mature enough to use an adult learning approach (Muduli et al., 2018). Thus, the same educational approaches can be applied to master's level students and companies' employees.

Table 14. Discussion summary

Hypothesis	Decision
H1. Finnish companies have a corporate training.	Approved
H2. Finish companies prefer in-house corporate training.	Approved
H3. Finnish companies prefer online corporate training.	Declined
H4. Form of cooperation with CEPHEI Project depends on the size of the company.	Declined

6 CONCLUSION

The research speculates around the interest of companies to conduct corporate training in cooperation with universities, participating in CEPHEI project. Adoption of this approach brings mutual benefits for all stakeholders. Companies can outsource problems and have international training. They save financial resources and time from having to search and prepare special training. Universities have a chance to teach digitally and cooperate internationally with industry. Learners have access to both digital and international innovation-related information. The research contributes to understanding the Finnish market of corporate training within industrial companies. It summarizes the existing literature on adult education and corporate training and investigates practices in the Finnish market. The main finding suggests that Finnish companies are not yet ready to explore opportunities for digital learning and prefer to have internal training in the traditional form that requires more resources to origination and participation.

There are several limitations associated with this study. The questionnaire was distributed only among industrial companies in Finland, as the profile of CEPHEI project is industrial innovations. Hence, there are some constraints in the generalization of the results to the whole Finnish market, the corporate strategy in other industries might be different. Moreover, the sample size is relatively small and some analysis, for instance, cluster analysis, was not possible to conduct in this study. Being successful, it could have provided a deep picture of what is happening in the market of corporate training.

Future research opportunities exist in conducting the study in all partner and program countries: Sweden, the Netherlands, Turkey, Russia and China. An extensive study will allow to identify cultural differences in corporate training and build a good marketing campaign for the project that considers these differences. The other opportunity is to increase the range of study in Finnish market and include different industries. It is recommended to follow the study with some in-depth interviews to understand the motives of companies in their choice of corporate training.

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APPENDIX 1

Industry-university collaboration in retraining

This survey is conducted as a part of Master's Thesis for LUT University. The research is aiming to learn how industry and university can collaborate in retraining.

The survey is anonymous and will take you less than 5 mins.

Thank you for participation! For any questions, please email anastasia.chakir@lut.fi

* Required

Choose language *

English

Finnish

Next

1. What is the size of the company you are working in? *

small (< 50 employees)

medium (50-249 employees)

large (>250 employees)

Corporate training is a professional training aimed to ensure an employee has the knowledge and skills to undertake a specific operation to enable an organization to continue to operate.

2. Do you have corporate training in your company? *

yes

no

In what form(s) the corporate training is organized in your company?

Indicate on the scale how often each of the forms is used, where is 1-not used at all, 2- seldom, 3- sometimes, 4-usually, 5-the main form of retraining.

3. Internal face-to-face training (organized by HR or training department) *

not used at all 1 2 3 4 5 the main form of retraining

4. External face-to-face training (conducted by an expert or influencer from outside of your company) *

not used at all 1 2 3 4 5 the main form of retraining

5. Internal online training (organized by HR or training department) *

not used at all 1 2 3 4 5 the main form of retraining

6. External online training developed by university for the needs of your company *

1 2 3 4 5

not used at all the main form of retraining

7. External online training developed by an expert/influencer/other company for the needs of your company *

1 2 3 4 5

not used at all the main form of retraining

8. External online training at massive online open courses (MOOCs), f.e. Coursera, Udemy, LinkedIn *

1 2 3 4 5

not used at all the main form of retraining

CEPHEI project is a consortium of 9 universities from 6 countries, with LUT University coordination. CEPHEI offers industrial innovation courses to university students, companies and the general public. It uniquely combines a digital learning educational approach with direct links to industry with the aim of educating the innovative leaders of tomorrow, solving current industry problems, providing freemium education to the general public, and creating a talent pipeline between university students and potential employers.

9. Would you like to cooperate with CEPHEI Project? *

yes

no

10. What form of collaboration is preferable for you? *

to delegate a retraining to the platform

to outsource cases and problems to platform learners

to publish own courses

to hire employees among successful students

I am not interested in collaboration

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