Tampere University of Applied Sciences

Thesis: Future Working Skills in Finland

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BACHELOR'S THESIS

May 2020

International Business

ABSTRACT

Tampereen ammattikorkeakoulu
Tampere University of Applied Sciences
Bachelor's degree in International Business

KAREN AHTIAINEN:
Future Working Skills in Finland

Bachelor's thesis 58 pages, appendices: 15 pages
May 2020

In a digital economy, more job roles are being automated and as a result, human job roles are changing in the future working environment. Having the right core job skills itself is insufficient to do the job efficiently and individuals need to have the right soft skills to complement the core job skills. The higher education institutions, such as TAMK, play an important role in preparing the students with the proper skills for the future work life.

This research aims to find out the type of core job skills and soft skills needed in the future working environment in Finland. Literature reviews and empirical studies were conducted using the e-Delphi method. Data were collected from 46 companies in the first-round and 12 companies in the second-round inquiry. Inductive approach was used with the mixed method of quantitative and qualitative to analyse the results. The findings were then divided into common themes based on Accenture's four defining job categories for the core job skills and 'New Skills Now' taxonomy for the soft skills as the conceptual framework.

The data revealed that core job skills in the 'Knowledge and Task-Based' job category were the most needed for the future with 'Apply We'Q' soft skills category as the most important type of soft skills needed to do these kind of jobs efficiently. In terms of skills for the general working environment, skills in the 'Apply We'Q' skills category are the most important irregardless of job roles. This skill category consists of skills which an individual will need to work effectively with others, face-to-face or virtually, by interacting and building a working relationship with the other person. The data also revealed that soft skills such as negotiation, emotional intelligence and problem-solving are currently insufficient in the work life environment in Finland.

While the results did not reach a consensus agreement on the level of needs, it still provided compelling results which identified the type of core job skills and soft skills that are relevant for the future working life environment in Finland.

Key words: future skills, finland, core job skills, soft skills

CONTENTS

ABBREVIATIONS AND TERMS

AI	Artificial Intelligence
EU	European Union
IT	Information Technology
NGO	Non-governmental Organisation
TAMK	Tampere University of Applied Sciences

1 INTRODUCTION

Finland has the most advanced digital economy in the EU, based on the Digital Economy and Society Index (DESI) 2019. Finland is Europe's most digitally advanced country and it is among the most digitally advanced countries in the world. (European Commission 2019.) Skills are important to ensure economic productivity and efficiency of a country and anticipation of the changing skill needs are important for the educational institutions to ensure that individuals have the right skills for the economic needs of a country (Wilson 2013, 102).

Companies in Finland recognised that graduating with a degree does not necessarily guarantee a person has the necessary soft skill competencies to do the job efficiently or to adapt successfully in the working environment. Due to this internet and technology age where automation is overtaking most of the manual and autonomy work, a combination of both core and soft skills are important. This is required in order to ensure that the graduates are employable, and the individual will be able to successfully integrate and communicate successfully in the working environment.

Tampere University of Applied Sciences (TAMK) is a higher education institution oriented towards preparing their students for working life, applying mainly pedagogical approaches to educate the students. Their strengths lie in multi-disciplinary education and creativity with a strong international dimension. (TAMK n.d.)

The purpose of this research is to determine what kind of core job and soft skill elements TAMK could improve or implement in their curriculum to prepare the students for the real working environment in the next five or more years and to ensure that the graduates are employable in the digital economy. The aim is to equip the students with the appropriate skills that are needed in the real-life working environment based on the companies' feedbacks. This research will also analyse the sufficiency of skills set taught in TAMK's curriculum based on the current work life situation. It is important for TAMK to be pro-active and plan ahead what kind of skills the companies in Finland require from their employees in order to ensure that students are 'employable' after graduation. TAMK will use this

research study as a guideline to determine which skill elements can be incorporated or improved in their degree programme curriculum. It will also provide TAMK with information on the sufficiency of skill sets currently taught in the curriculum.

The first part of the thesis consists of conducting literature review on the theories of core job and soft skills needed for the working environment and existing studies done regarding future working skills in a digital economy. Thereafter, research approaches and methodologies were studied and compared to determine the best approach and method to use for this research.

The second part of the thesis is an empirical study on future skills in Finland. Delphi method was used in the research and two rounds of inquiries were conducted, whereby the respondents were asked in the first part in open questions on their opinion of core job skills needed for the future and soft skills needed for those jobs and in the general working environment. In the second part of the research, respondents were asked if they agree with the results on core job skills needed, as well as the soft skills elements needed for the general working environment. Respondents were also asked to provide their opinion on the sufficiency of those soft skills in the current work-life environment.

Part three of the thesis consist of analysing the research findings and providing a summary of the findings, conclusion and recommendations. The discussion section reflects the success and reliability of the research, as well as, suggestions based on the experience, findings and results.

2 OBJECTIVES AND PURPOSE

There is always a link between employment and education, recent socio-economic discourse has emphasized the role of education to prepare students for the working environment, opening opportunities and facilitating social mobility. The overall aim of education is to impart knowledge and understanding to the students. Education needs to prepare individuals for the working life environment, and it can also help the individuals to play a part in designing and shaping the future. In summary, education plays a key role in facing significant challenges, such as ageing society, climate change, technology change, sustainable economic development, and inequality. Therefore, the education services have a choice to either handle this passively or proactively. (Wilson 2013, 102.)

In a survey conducted by the World Economic Forum (WEF 2018) on 'Future of Jobs Report', majority of employers expects that by 2022 the skills required to perform most jobs will have shifted significantly. According to the survey, while the skills needs could differ amongst the industries and regions, the respondents expect an average skills stability in proportion with the core skills required to perform a job to shift by 42 percent over the 2018-2022 period. (WEF 2018; Ehlers 2019, 8.) The WEF 2018 also estimated that by 2022, 62 percent of a company's information and data processing and information search and transmission tasks will be performed by machines compared to 46 percent today. Despite these findings that are pointing towards the usage of more machines and less human, it does not mean there will be fewer job roles available. By 2022, it is estimated that emerging new tasks and jobs will offset the declining jobs that are being replaced by machines. These emerging professions are estimated to increase employment from 16 percent to 27 percent (11% growth) across all industries. (WEF 2018, 7-8.) Therefore, research on future skills has become more important, in order to find out the list of job skills needed for the future working environment and the soft skills that are needed for the specific jobs.

According to Accenture's report on New Skills Now (2017), the future working environment and labour markets will be disrupted and altered due to the fast-paced changes in technology and information flow will also change globally.

Some of these changes will lead to routine jobs being automated using technology instead of humans, however these changes can also create new jobs which could involve more flexible work. Therefore, the needs of the job markets could be changing in terms of the skills needed to do the work. However, not all individuals are aware of these changes or seizing the opportunities available and handling the potential obstacles to adapt to these changes and this could lead to a disadvantage for them in the future. (Accenture 2017, 2-6.)

Accenture did a survey in 2014 with senior executives and students in Finland which provided important insights into the country's skills gap between the employers and students. The study found significant differences in perception between the two respondents. The survey also showed that there is widespread concern about the lack of proper skills required in the working environment. It revealed several areas where perceptions of those who need relevant skills to meet the business goals and those who are tasked with finding those skills need to be more aligned. As Finland evolves into a digitally enabled economy, the education, skills and business must also undergo changes to remain globally competitive well into the future. Therefore, employees of tomorrow must be prepared to adapt to these changes by being more collaborative, creative, entrepreneurial and digitally savvy than before. (Accenture 2014, 3-5.)

According to OECD (2019), failure to develop and maintain skills that are relevant to the labour market results in recruitment difficulties for employers while at the same time, many individuals, from recent graduates to workers with considerable experience, struggle to find jobs that match their qualifications. Lack of certain skills or skill sets can limit the ability of companies to adopt new technologies and therefore lead to lower competitiveness and efficiencies for the companies. At the same time, individuals who do not have the right skills for the job may face lower wages, job dissatisfaction, job security and poorer career prospects. (OECD 2019, 2.)

TAMK recognised the importance to educate their students with the right job skills while integrating soft skills into the course curriculum to ensure that the graduates are equipped with the proper skills to match current and future work in Finland. Therefore, they would like to find out what kind of core job skills and soft skill sets

are needed for future jobs in Finland. They would also like to find out if those skill sets are currently sufficiently taught in order to prepare the graduates to seek employment and do their job efficiently.

While it is undeniable that the economy is evolving into a digital economy and many jobs have been replaced with machines, such as automated cashier in supermarkets, this research is not limited to digital skills, rather future core and soft skills that incorporates not just the digital skills but also to determine what kind of other skills are in demand due to the changes brought by economy digitalisation.

Therefore, the purpose of this research is to find out what kind of core job skills and soft skill elements TAMK could implement and integrate into their business degree curriculum that will make TAMK graduates employable and at the same time, prepare the graduates for the future working environment.

The main questions for this research are:

1. What core job skills are needed for the future working environment and which soft skill elements are needed to complement those core job skills?
2. Which soft skills in general are important to have in the working environment?

The sub-question to support the main question are:

1. Which of those soft skill elements needed are sufficiently integrated into TAMK's degree curriculum?
2. Which soft skill elements are important for TAMK to integrate into their degree curriculum?

3 THEORETICAL AND CONCEPTUAL FRAMEWORK

Many countries face the challenge of matching the education and training of their people with the current demands of the economy and skills anticipation or forecasting is one way of determining the needs. There are different methods and approaches to anticipate the changing skills needed for education. (Wilson 2013, 102.) Bell (1996) pointed out that there are many standard research methods which can be used to forecast the future needs, and this includes quantitative and qualitative methods using surveys, participant observation and focus groups and each of these have their advantages and disadvantages. However, by combining these methods, it can provide an insight into the perceptions of the future (Bell 1996; Wilson 2013, 103.)

According to Almeida, Behrman and Robalino (2012), the accumulation of human capital through the acquisition of knowledge and skills is recognised as central for economic development. Educated employees not only have better employment opportunities, but they also earn more and have more stable and rewarding jobs. However, companies are also frequently complaining that employees' lack of skills constraints their business efficiencies. This situation is further complicated by the diversity of skills that seem to be needed in a job. Furthermore, recent empirical analyses show that success in being employable does not only depend on the knowledge of technical skills, but also cognitive and non-cognitive skills, and both the core job and soft skills are determinants of an individual's employability and earnings later in life. A pattern that is emerging shows that, as economies develop and diversify, the demand for higher-level cognitive skills increases relative to the demands for manual job-specific skills. (Almeida, Behrman and Robalino 2012, 14.)

3.1 Theoretical Framework

Gary Becker (1964) made the first attempt to distinguish the different type of skills needed in the job market. He distinguished the 'general' skills, which are useful in all types of jobs and companies, and 'specific' skills, which are required by a specific job or type of companies. (Becker 1964; Suleman 2017, 267.) Thereaf-

ter, many experts have conducted empirical analysis on employability skills, using both direct and indirect methods. In 2017, Suleman conducted a research on the analysis done by the experts and summarised the set of employability skills in her article titled 'The employability skills of higher education graduates: insights into conceptual frameworks and methodological options' (Suleman 2017). The research seeks to find out what are employability skills precisely and can these skills be detailed in an inventory of skills. Figure 1 below shows a modified version on the summary of employability skills. (Suleman 2017, 273.)

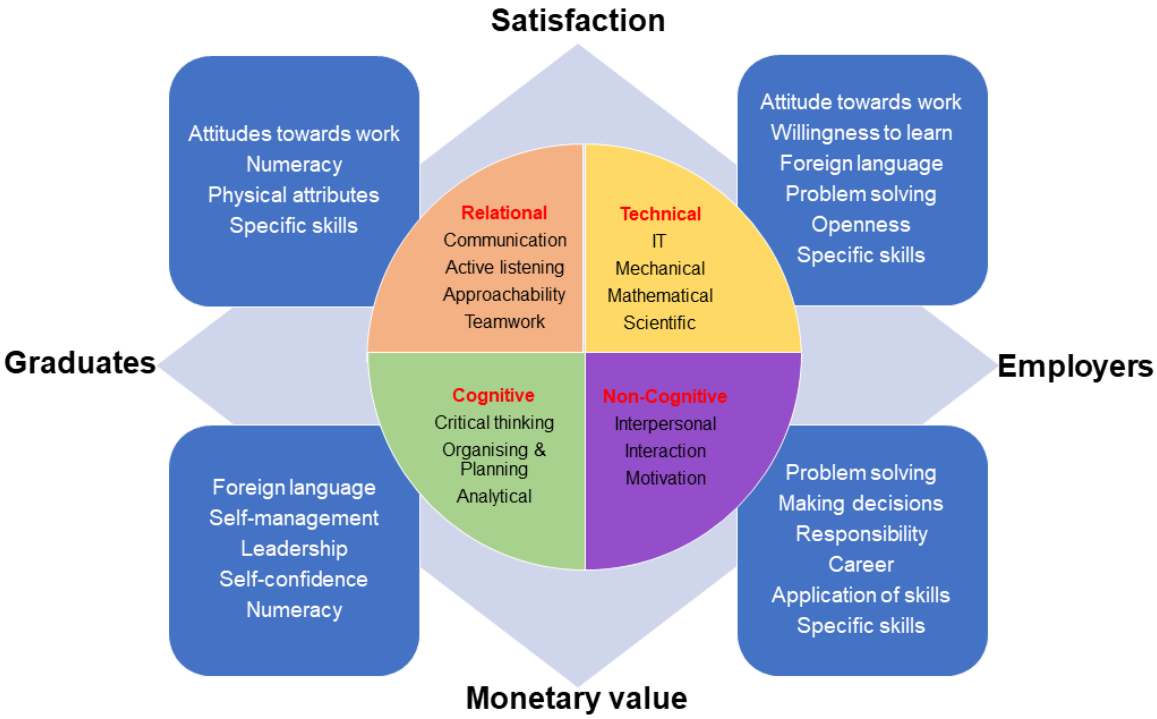

Figure 1. Summary of employability skills (Suleman 2017, modified).

Figure 1 shows that there is an underlying agreement on the following skills: relational (communication and teamwork), technical (IT and scientific skills), cognitive skills (analytical and critical skills), and non-cognitive skills (interaction and motivation skills). These are the core skills that higher education institutions should focus their attention on. Figure 1 also shows a summary of the foundation skills (Olivier, Freeman, Young, Yu & Verma 2014) or methodological and generic abilities, which help boost graduates' employability (García-Aracil & van der Velden 2008, 226-227). Foundation skills are the absolute minimum a graduate need to be employable, such as oral and written communication, numeracy and

the capacity to develop knowledge and skills, as well as analyse and solve problems (Olivier, Freeman, Young, Yu & Verma 2014, 62). Methodological competencies are defined as being able to react to a problem appropriately and find solutions that are sensible to solve the problems. Generic competencies are defined as competencies that can be applied across a broad range of context. (García-Aracil & van der Velden 2008, 226-227.)

These skills show that employers demand observable and non-observable skills. Relational skills can be observed and assessed directly by the employers or higher learning institute, while cognitive skills are hard to observe but these are skills required by employers. In summary, employability skills refer to a group of both general and transferable skills which are useful in any workplace for any job roles, in addition to the specific job skills needed to do the job. (Suleman 2017, 275.)

In Accenture's report on skills needed for Finland's future (2014), the survey found some significant differences in the perception between the senior executives and students interviewed. For example, there were major divergences on the skills required in a working environment, the skills that students actually possessed and the areas of greatest employment opportunity. Despite a 22.9 percent unemployment rate among Finns under 25 years of age in 2014, companies still find it difficult to hire qualified candidates. This clearly shows a mismatch between the skills needed by companies to effectively execute their business strategies and the skills of graduates entering the workforce. As Finland evolves into a more digital economy, the nature of work is evolving from standardised, repetitive activities to more complex, problem-solving ones. As a result, companies are increasingly looking for employees that have not just one or two specific skills, but a diverse portfolio of skills that can help them operate more seamlessly and efficiently. (Accenture 2014, 3-11.)

Accenture also did a global survey for skills needed for the future of digital economy. Based on their research with the innovators, business executives, NGOs and influencers in education from 31 countries across Asia, Europe and America, individuals need to invest in acquiring new skills to work if they want to stay relevant in the future. Accenture's 'New Skills Now' report (2017) revealed that 65

percent of young school children will be employed in jobs that do not even exist yet. By the year 2024, roles requiring digital skills will grow by 12 percent, while 82 percent of businesses using collaboration tools want to increase their future use. Project-based work will increase from 28 percent in 2015 to 66 percent in 2020. (Accenture 2017, 4-8.)

3.2 Conceptual Framework

During an economy recovery in 2010, Accenture launched their 'Skills to Succeed' (2010) and the aim of this was to improve the skills and unemployment gaps around the world. According to Accenture, they collaborated and worked with an international network of more than 500 non-profit organisations and other eco-system partners to do so and succeeded in preparing more than 1.7 million people with skills that will get them a job or build their own business. However, in recent years, the rapid pace and scale of technological change, as well as, the global flow of information are disrupting the employment market and fundamentally altering the type of job skills needed for the future. This challenge compelled them to undertake their research on 'New Skills Now: Inclusion in the Digital Economy.' (Accenture 2017, 2-3.) The primary aim of this research is to incorporate their learnings from 'Skills to Succeed' with the latest trends and opinions into a useful reference framework for the employment practitioners and funders. They also wanted to challenge the experts to think and debate about how to 'future-proof' workforce development in a rapidly changing economy. (Accenture 2017, 3.)

An empirical study was conducted for this research by interviewing more than 40 professionals and experts from different field of expertise, which includes: neuroscience, workforce development, corporate learning and talent development, education, sociology and cognitive psychology. They have also analysed over 130 million job postings; surveyed 1,000 workforce development programs; established a Learning Circle that is formed with specialists from around the world; and appraised more than 25 of the leading frameworks with regards to the future of work and skills. Their research revealed that the earlier an individual develop the 'New Skills Now' and build the right mindset and habits, the more likely they are to succeed in the future. Future generations can also expect to navigate multiple

jobs, some of which have not yet been created. Therefore, a growth mindset with characteristics such as resilience, adaptability and willingness to learn, underpins all other skills a job seeker or an entrepreneur needs to successfully navigate the future of work. (Accenture 2017, 3.)

The conceptual framework of this research is based on Accenture's theory on the four defining features of job types and their New Skills Now taxonomy on soft skills (Accenture 2017). Both these concepts provide a framework on how to gather, group and analyse the data in this research. The results will then be presented in the format of these concepts to show which are the job skills and soft skills needed for the future work-life environment. These skills concepts were used as the framework in this research as it consists of the cognitive competencies and attributes which are needed to remain relevant and at the same time, develop in the fast-paced digital economy (Accenture 2017, 14).

3.2.1 Job skills features of the future

Based on two of Accenture's previous researches (2017 Technology Vision and Digital Disruption) and the 'New Skills Now' research, Accenture identified that the future of work has four defining features, as shown in Figure 2 below:

Figure 2. Accenture's four defining job skills (Accenture 2017, modified)

- **Digital and Human:** Accenture's 'New Skills Now' report (2017) stated that digital technologies such as machines, artificial intelligence (AI) and robotics are changing the way of working nowadays and hence, in the future, humans need the skills to work together with machines to drive productivity and efficiency in a business (Accenture 2017, 9). According to Purdy and Daugherty in Accenture's 'Why Artificial Intelligence is the

Future of Growth report' (2016), AI could increase productivity by 40 percent and annual economic growth rates could double by 2035 in developed economies with Sweden (37%) and Finland (36%) leading the way. The study also reported that 82 percent employees agree and acknowledge that digital technologies will change the way humans work in the next three years. (Purdy & Daugherty 2016, 17, 23.)

- **Cooperative and Collaborative**: This job category requires colleagues and customers to work together for mutual benefit and towards a shared goal. The digital technology is changing the way people are working together with the availability of tools such as interactive portal and social networking. It also increases the potential to work with colleagues and customers across the world and multiple platforms. (Accenture 2017, 10.)

- **Knowledge and Task-based**: According to Sloman and Thomas in Accenture's 'Humanizing Work Through Technology Vision Report' (2016), 79 percent of business experts in different industries believe that the structure of the future workforce will be more of a project team based than by job function. This way of working will enable the people in a company to share ideas, feedbacks and innovations at all levels. (Sloman & Thomas 2016, 3.)

- **Flexible and Fluid**: In this digital economy, technology has allowed humans to connect with each other irregardless of geographical location. Accenture's Technology Vision Report on 'Workforce Market Place' (2017) states that 85 percent of IT and business executives plan to increase the usage of independent freelance workers in their companies over the next few years. (Accenture 2017, 6.) This flexibility enables the freedom to earn more income, choose the number of working hours and by eliminating the geographic and time constraints, it also allows people to seek for jobs that are outside the city they are living in. (Accenture 2017, 12.)

3.2.2 Soft Skills taxonomy for the future

As a result of the research and interviews with experts from different fields, Accenture used their insights to determine and classify both the common skill families and the elemental cognitive capabilities that needs to be included in the digital economy and thus, created a taxonomy called 'New Skills Now'. (Accenture 2017, 13.) Figure 3 below shows a modified version of the 'New Skills Now' taxonomy.

Figure 3. Accenture's New Skills Now Taxonomy (Accenture 2017, modified)

Figure 3 shows a modified version of Accenture's New Skills Now taxonomy which consists of the cognitive abilities, aptitudes and attributes. These soft skills, together with the core job skills for a specific job market, industry or environment, are the important skills needed to stay relevant and succeed in the fast-paced digital economy. According to Accenture (2017), 'Cultivate a Growth Mindset' is the cornerstone that connects all the six skill families. This skill set family will provide the required skills to stay relevant, adapt, specialise and grow in the new digital economy, such as agility, resilience, curiosity and motivation for learning. (Accenture 2017, 14.)

A dynamic mix of these six skill families are important to secure the first job or start a new business and it is also critical in retaining a job, growing a business, staying relevant or navigate the next job opportunity. According to Accenture (2017), 'New Skills Now' also focuses on competencies that an individual can learn at any age and improve throughout their study and working lifetime. (Accenture 2017, 14.) In order to succeed in the digital economy, the next generation of individuals will need to build these critical skills early, as well as, adopt continuous learning through every stage of their life. These skills can be developed and strengthened both inside and outside a higher learning institution or workplace. (Doidge 2007; Accenture 2017, 14.)

Below is a description of the six skill families and why it is important for the future working environment:

3.1.2.1 Learn to Earn

This skills family are the minimum competencies and foundation required for work. This means minimum literacy, numeracy, language and digital literacy competencies. It also includes the basic skills for employment, behaviour and practise, such as IT skills, listening and time management. Core cognitive functions, such as focused attention, working memory and organising are also important. (Accenture 2017, 15.)

These foundational skills are essential to gain higher learning and better earning, and central to this is self-efficacy, which is one's competency to gain knowledge and motivation to achieve their goals (Cleary & Zimmerman 2004; Accenture 2017, 15). Bandura (1977) formally defined self-efficacy as "personal judgements of one's capabilities to organize and execute courses of action to attain designated goals" (Bandura 1977; Zimmerman, 83). Studies conducted by Multon, Brown and Lent (1991) revealed that about 14 percent of the difference between students' performance lies in self-efficacy (Multon, Brown and Lent 1991, 34). According to Morris (2018), with the advancement of digital technology, being literate doesn't mean just being able to read and write in the basic level, rather it has evolved into digital literacy. One must now be able to utilise online tools and social media platforms. (Morris 2018.)

3.1.2.2 Build Tech Know-How

The skills in this category are measurable technical skills and knowledge can be acquired through education, while expertise can be acquired through practice. This means that an individual will need to have the competencies to analyse, explore and share the data collected from the digital platform. The individual should also be able to work together with machine intelligence effectively. This requires an individual to learn and understand how technology and data can be built, controlled and used. (Accenture 2017, 17.)

According to Accenture's New Skills Now report (2017), technology and data skills are no longer just for the experts working in technical job roles. Based on their research, 85 percent of those interviewed believed that the ability to use and understand digital and other emerging technologies will become more important in the next five years and more. All job roles and businesses already have a digital component and will continue to be so in the future. (Accenture 2017, 17.) According to McLaren (2019), those who have been developing their tech skills are already silently moving ahead of others as they are learning skills that are relevant to the industries and job roles of the future. The skills needed goes beyond the basic IT skills, such as email and Microsoft Word, it goes deeper and it ranges from blockchain and artificial intelligence to learning how to code applications and websites and knowing how to navigate video editing software. (McLaren 2019.)

3.1.2.3 Apply We'Q

This category consists of skills which an individual will need to work effectively with others, face-to-face or virtually, by interacting and building a working relationship with the other person. According to Accenture (2017), the soft skills in this category consist of skills such as teamwork, collaboration, communication, social and emotional intelligence, and the competency to handle others. This skill family also includes cognitive functions such as self-management that will allow the individuals to understand, control and adapt their emotions and behaviours in a team environment. (Accenture 2017, 19.)

Accenture (2017) emphasized that, in an increasingly digital working environment, skills such as empathy, teamwork, emotional understanding and listening are gaining importance. According to Ready (2019), a senior lecturer in organisational effectiveness at the MIT Sloan School of Management and founder and chief executive of the International Consortium for Executive Development Research (ICEDR), mastering personal relationship that builds trust with a co-worker and creating a collaborative work environment is important to the effectiveness of leadership in the digital economy. Collaborative relationships are not only essential for producing better results, but it also builds a more dynamic working environment. In his article in MIT's Sloan Management Review, he quoted Lori Beer, chief information officer of JPMorgan Chase, who said: “Without mastering collaborative relationships, both inside and outside the company, we won’t produce the outcomes needed to win our customers’ business.” Lori went on to say, “We don’t need everybody to know how to write the perfect API, but we do need people with a passion for working together to create an understanding of how those APIs, a blockchain, the cloud, AI, and machine learning can change the way you think about delivering services to our customers.” (Ready 2019.) According to World Economic Forum (WEF 2018), skills that will see a huge increase in demand by 2022, relative to the current situation are emotional intelligence, leadership, social influence and service orientation and skills such as persuasion and negotiation will retain or increase in value. (WEF 2018, 12.)

3.1.2.4 Create and Solve

This category consists of skills an individual will need to solve problems creatively by using empathy, logic and innovation. It consists of creative problem solving, design thinking, critical thinking, reason and logic to appraise and resolve problems, and an entrepreneurial mindset. This skills sets also include cognitive functions such as decision making and the capability to plan and execute a goal. (Accenture 2017, 22.)

While a straightforward problem can be resolved using automation and human intelligence, problem-solving and logic thinking will remain important to solve

more complex problems. In a digital economy, complex problems require individuals to think in an unorthodox way and gather ideas and inputs from different sources. As automated tasks increase, there will be more demand for the human skills of creativity and dexterity, which cannot be imitated or replaced by machines. The workforce experts interviewed in the New Skills Now report rated this skill family as one of the most important skill family for both entrepreneurs and employees now and in the future. (Accenture 2017, 22.) According to World Economic Forum (WEF 2018), skills that will grow significantly by 2022 are analytical thinking and innovation, and skills such as creativity, critical thinking and complex problem solving will retain or increase in value. (WEF 2018, 12.)

3.1.2.5 Cultivate a Growth Mindset

By developing skills in this category, an individual will learn to stay relevant, be agile and curious, as well as, learning continuously and adapting to the pace of change. The soft skills in this category includes the ability to develop curiosity, openness, a growth mindset and the capacity for lifelong learning. With the cognitive function of flexibility as a support, these skills are the elements an individual will need to be resilient and have the capability to cope with and adapt to change. (Accenture 2017, 24.)

According to Accenture (2017), work will no longer be limited to just one employee, job or team. Therefore, individuals need to continuously learn new skills to remain relevant and be adaptable to the environment, hence, a growth mindset is important in order to be successful. Having the inspiration and love to learn new things and skills will also be critical to succeed in an evolving economy and labour market. (Accenture 2017, 24.) The World Economic Forum (WEF 2018) revealed that skills such as resilience and flexibility will retain or increase in value by 2022. (WEF 2018, 12.)

4 RESEARCH APPROACH AND METHODOLOGY

The research methodology is a path that a researcher will use to construct the research problem and objective and present the results of their findings. A research design is the framework used for the intended study. (Sileyew 2019.) The research design enables a researcher to focus on the methods that are suitable for the research question(s) (Bhat n.d). Research design is important as it ensures the research process is efficient by yielding maximum information with minimal effort, time and money. According to Kothari (2004), a good research design minimises bias and maximises the reliability of the data collected and analysed. The following factors were considered in this research design: means of obtaining information; availability and skills of research; the objective of the research question; and the availability of time and money for the research. (Kothari 2004, 33.)

4.1 Research design

There are different methods to research and collect the data for the research questions, namely desk research to review existing data concerning the questions asked, observations of the target group, surveys, and various types of interviews. As the questions are related to the future working environment, observation of a target group was not feasible as this method refers to studying an individual or group behaviour and reaction to a current situation (Provalis Research 2019). Interview method involves conducting an intensive or detailed individual interview with a sampling group to explore their opinion and ideas on a particular idea or situation (Dudovskiy n.d.). This method was a consideration but due to time constraint, lack of control on the sampling group and language barrier, it was not possible to use this method.

Therefore, desk research and an empirical study using e-Delphi were selected as the best method to use based on the problem of the research, resources availability and constraints of time, money and sampling group.

Olaf Helmer and Norman Dalkey, who was part of a project team in RAND Corporation, laid the foundations for the Delphi method. This method was used to gather a consensus opinion from a group of experts by asking intensive questions

with controlled opinion feedback. (Helmer & Dalkey 1962, 1.) Delphi is a method used to achieve a common viewpoint or opinion from the sampling group using questionnaires to gather the data (Msibi, Mogale, Waal & Ngcobo 2018, 2). This is a useful method to collect an individual's viewpoint or ideas about issues where there is no or little evidence and thus, opinions are important (Thangaratinam & Redman 2005, 120). The Delphi method is suitable for this research as it is a structured group communication method for soliciting expert opinion on forecasting the future scenarios, using a series of questionnaires and controlled feedback. Key decisions can be identified to help guide the conduct of an inquiry, by isolating those decisions that have the most influence upon the standard of the final research deliverables. (Day & Bobeva 2005, 103.)

Delphi method has also been known to be useful in the education settings, especially higher learning education. It is used to research and formulate education guidelines, standards and predicting trends. (Green 2014, 2.) Judd (1972) listed five major uses for this method in the higher learning education, namely: cost-benefit analysis; curriculum planning; university education goals and objectives; and a general view on the future educational goals and objectives. (Judd 1972; Green 2014, 2.) Green (2014) suggested that the Delphi method is a useful tool for educators to develop their curriculum and learning experiences to prepare the students for their future careers. These studies are useful when coordinated with other grounded research in determining curriculum needs, training and staffing needs. (Green 2014, 2.)

Linstone and Turoff (1975) identified three criteria which can be used to determine when the Delphi method can be used:

- The problem cannot be analysed with precise analytical techniques, rather it can benefit from subjective collective judgments. (Linstone & Turoff 1975; Green 2014, 2.)
- The individuals needed to contribute and give their opinions on a broad or complex problem and those individuals represent diverse backgrounds with respect to expertise or experience. (Linstone & Turoff 1975; Green 2014, 2.)
- The diversity of the participants must be preserved to assure the validity of the results. (Linstone & Turoff 1975; Green 2014, 2.)

With the traditional Delphi method, two or more rounds of face-to-face interactions are conducted to reach a consensus for the research. In this technological era, the e-Delphi method is a convenient and pragmatic way of conducting and analysing research as it allows the participants to post their ideas and opinions online in their own time and vicinity. The participants also have the option to remain anonymous and hence, they would be more willing to give their honest opinion or ideas. (Msibi et al. 2018, 2.) Mamaqi, Miguel and Olave (2010) stated that the e-Delphi method is ideal for anonymity and unbiased opinion, as the physical presence of the researcher does not influence the communication which could lead to prejudiced answers (Mamaqi, Miguel & Olave 2010, 1321). Participants may also not be willing to discuss openly and honestly in the presence of a researcher. Delbecq, Van de Ven and Gustafson (1975) suggested that two or three iterations with the Delphi method are sufficient for the research and the process stops if the research questions are answered and sufficient information has been gathered (Delbecq, Van de Ven & Gustafson 1975; Mamaqi et al. 2010, 1321). The purpose of the first iteration is to identify broad issues related to the questions in the research. Therefore, the questionnaire should consist of mainly open-ended questions. The questions are then analysed qualitatively and categorised into common themes. The responses are then used to construct the second questionnaire. The second and subsequent questionnaires should be more specific, with the questions seeking to validate, rate or rank the various items in the identified common themes and these are usually analysed quantitatively. (Thangaratinam & Redman 2005, 120.)

For this research, two rounds of questionnaires were conducted. The questionnaires are presented in Appendix 1 for Round One and Appendix 2 for Round Two. The process was conducted in three phases, as shown in Figure 4:

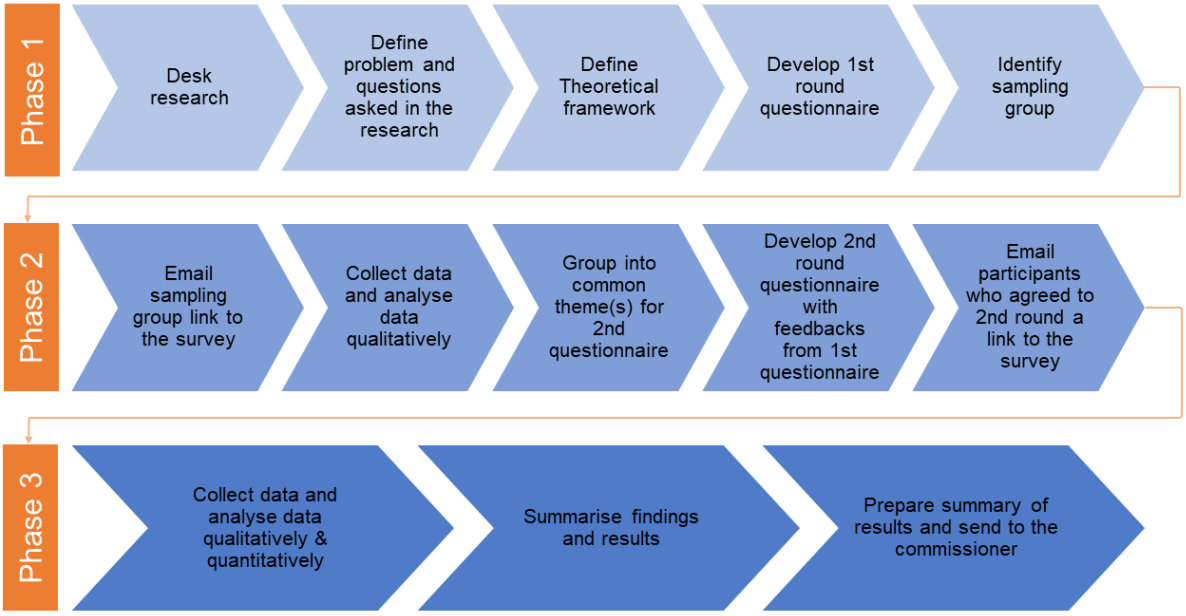

Figure 4. The three phases of research's e-Delphi process.

4.1.1 Phase 1

Phase 1 consist of desk research on theories and concepts, as well as, existing studies on job skills and soft skills for employment. Thereafter, the problem and questions were defined for the research. Open questions were then created in the first questionnaire using SurveyPal management platform. The sampling group information was gathered by compiling a list of potential participants with identified email information.

4.1.2 Phase 2

Phase 2 consist of emailing the online questionnaire link to the targeted participants explaining the purpose of the research for Round One. Participants were also asked to provide their contact details if they wish to participate in Round Two. A total of 46 respondents participated in the first-round questionnaire. The responses were then analysed qualitatively and segregated into common themes. Some of the results were provided as feedback and integrated into Round Two questionnaires where participants need to respond if they agree or disagree and to provide their opinion on the results. The second-round question-

naire was emailed to the list of participants who agreed to participate in the second-round questionnaires. A total of 12 respondents participated in Round Two questionnaire.

4.1.3 Phase 3

Phase 3 consist of analysing the results qualitatively and quantitatively, prepare a summary of the results and findings. The results were then sent to the commissioner of this research.

4.2 Research approach

There are three types of research approaches, namely:

- **Deductive Approach**. This approach is used when the researcher has developed a set of conceptions that needs to be confirmed or rejected during the process of the research (Dudovskiy n.d). In summary, this approach is used when the researcher needs to test a theory.
- **Inductive Approach**. This approach is the opposite of deductive approach where theories are formed after the observation process. This approach involves searching for a pattern based on the observation and development of explanations. (Bernard 2011; Dudovskiy n.d.) However, this does not mean that theories when developing the questions and objectives are ignored, this approach intends to generate the meaning of the findings to form a theory or to explore an existing theory (Dudovskiy n.d).
- **Abductive Approach**. This approach is used to offset the weaknesses of both the deductive and inductive approaches by adopting a logical viewpoint. According to Dudovskiy, this approach starts with ‘surprising facts’ or ‘puzzles’ and the process is dedicated to explaining the facts or puzzles. It seeks to find the best explanation for them and both numerical and cognitive reasoning can be used during the process. (Dudovskiy n.d.)

Deductive approach follows a framework tightly and it is pre-structured which could lead to too much restrictions that could ignore certain important features. On the other hand, inductive approach could be described as ‘too loose and

emergent' which could lead to too much data or data indiscrimination during the empirical study. (Miles and Huberman 1994; Dubois and Gadde 2002, 558.)

In the case of this research, abductive approach was selected as it is positioned between inductive and deductive approaches. Charles Sanders Peirce was considered as the founding father of the abductive approach. He founded this third approach as an addition to the deductive and inductive approach as he concluded that both the deductive and inductive approaches are inadequate to explain the reason of a researcher. (Gold, Walton, Cureton and Anderson 2010, 233-234.) There are different kind models that use the abductive approach as the essential element. This research adopts Van de Ven's 'engaged scholarship research model'. Van de Ven (2007) defined 'engaged scholarship' as "a participative form of research for obtaining the different perspectives of key stakeholders (researchers, users, clients, sponsors, and practitioners) in studying complex problems. By involving others and leveraging their different kinds of knowledge, engaged scholarship can produce knowledge that is more penetrating and insightful than when scholars or practitioners work on the problems alone." (Ven 2007, 9.)

Van de Ven (2007) stressed that a research is not a solitary exercise, rather it is a collaborative one. The engagement means that a researcher seeks the opinions and interpretations of other experts in the research process. He developed a collaborative method in which the 'engaged scholarship' framework supports further discovery about a complex phenomenon by involving others in the activities during the research process, such as theory building, problem formulation and problem solving. Each of these activities can be conducted in any sequence and the activities can use different approaches, for example a researcher may want to start with a theory first and then define the problem to apply and evaluate the theory while others may want to start with defining the problem first and then develop a theory using certain methodological tools. (Ven 2007, 10-11.)

With regards to this research, the scope and topic were investigated to determine the objectives and problems of the research. Initial meetings were conducted with the commissioner of the research to find out their expectations and goal of the research, the budget and limitations. Thereafter, desk research was performed including literature review. Conceptual literature review was conducted on the

concepts and theories of both core job skills and soft skills for employment, while empirical literature reviews were conducted on existing studies regarding job skills and soft skills needed for the future work environment, both globally and in Finland.

This research aims to explore the type of core job skills and soft skills individuals will need for the future work life in Finland. Deductive approach was used to define the theory with a theoretical conceptual framework as the foundation to create a reference and used as a guideline when conducting the empirical study. (Blumer 1954; Dubois and Gadde, 558.) while the inductive approach was used to conduct the problem solving and evaluation as it is flexible, descriptive and it seeks to examine the phenomenon, opinions, predictions and feedback from the experts based on their knowledge and experience. (Cooper & Endacott 2007, 816.) The findings are then summarised into themes and an assumption is then developed based on the data. The conclusion was then drawn based on those assumptions and the feedback and opinions of the representation group.

While the findings cannot yield an absolute conclusion for this research, it can increase knowledge which can help TAMK predict the kind of core job and soft skills needed in the future. The conclusions using this approach may only probably be true, but they are compelling with the relevant evidence found in the findings and is therefore generally convincing. (Butte College n.d.) The findings and assumption will then be presented to TAMK on the types of future core job skills and soft skills needed in Finland to help them plan and decide on their degree curriculum to prepare the students for the future work environment.

4.3 Research analysis

Once the questions to answer the research problem have been developed, online questionnaires were created using SurveyPal to gather information on the perception of companies in Finland on jobs and soft skills needed for the future work environment. E-Delphi method, with the mixed method of quantitative and qualitative, were used to collect the data and analyse the results. The questionnaires were conducted in two rounds.

The first-round questionnaire was targeted to companies in Finland to find out their opinions and perceptions on the type of core job skills and soft skills that will be needed in the future in their respective industries. The second-round questionnaire was sent to the respondents who provided contact details and consent to the second-round research. Round Two aims to validate the results in Round One and seek further information on the general soft skills needed for the working environment.

There are three types of research methods, namely quantitative, qualitative and mixed-method, which incorporates both quantitative and qualitative method. According to Creswell (2009), quantitative research is a method for testing objective theories by examining the relationship among variables. These variables can be measured with numbered data that can be analysed using statistical procedures. Qualitative research is then a method for exploring and understanding the meaning individuals or groups which attributes a social or human problem. The process of this research involves questions and procedures related to the problem and the data is collected and analysed, identifying the patterns and connections that can answer the questions, and it is then divided into one or more themes. The researcher then evaluates and interprets the collected data, theme(s) and present its findings in a discussion. Mixed method is the method that collects both quantitative and qualitative data, integrating the two forms of data, and using specific methods which may involve philosophical assumptions and theoretical frameworks. The idea of using a mixed method is so that the approaches will provide a more complete understanding of a research problem than either approach alone. (Creswell 2009, 3-4.)

With regards on which type of question method to use for this research, the qualitative method tends to be less constraint and it provides participants with the opportunity to think openly and provide their opinion and feedback on the current situation and their forecast of their future business, which can then provide insights of what kind of jobs and soft skills are needed based on their feedbacks. The quantitative method tends to see the future based on a set of key indicators and driving factors and it is essential to provide an understanding of the labour market. However, since trends could change due to factors such as political, so-

cio-economic and so forth, quantitative method cannot be used alone as a solution to seek the answers to forecast skills for the future working life environment. (Wilson 2013, 103.)

Therefore, a mixed method of both quantitative and qualitative questions were used to collect the data. Quantitative questions were used to define the respondents' type of industries, size of companies, age and job title of respondents to determine the background of the respondents. The purpose of this is to provide a rationale and correlation to the qualitative data on the opinions and feedback. Qualitative questions were mainly used in the questionnaire as the future perception is a subjective matter which explores the respondent's perception on the future jobs and soft skills needed in Finland and the reason for the perception.

4.4 Representation group

A sampling or representation group occurs when the research selects a portion of a larger group of potential participants and use the results as findings that apply to the broader group or population. In theory, a solid representation group is free from bias and reliable as they represent the entire population of interest being examined, thus enabling the researcher to draw a valid conclusion on the research. (Salkind 2012, 2.) There are two different type of representation groups:

- Probability representation, in which the researcher has access to a list of accessible individuals within the targeted population. (Salkind 2012, 3-4.)
- Non-probability representation is used when the researcher has no access to any individuals in the targeted population and is not able to control the individuals being selected to represent the research. (Salkind 2012, 3-4.)

In the case of this research, non-probability representation was used due to the e-Delphi method which usually adopt the non-probability techniques. This method uses individuals who have knowledge on the topic of the questions being researched. Therefore, these group of 'informed individuals' or 'experts' were selected to apply their knowledge and opinion on the problem being researched. While the participants were not selected randomly, the non-probability represen-

tation was selected without the knowledge on whether those chosen are representative of the entire industries being examined. (Hasson, Keeney and McKenna 2000, 1010.)

5 RESEARCH FINDINGS

The research findings focused on the perceptions of the respondents who provided their knowledge and opinions on the future core job skills and soft skills needed in Finland. From the two rounds of questionnaires, the participants provided information to answer the main questions this research seeks to find out, namely:

1. What core job skills are needed for the future working environment and which soft skill elements are needed to complement those core job skills?
2. Which soft skills in general are important to have in the working environment?

The participants also provided their opinion and information with regards to the level of skill sufficiency in the current work life environment to answer the sub-questions this research seeks to find out which are:

1. Which of those soft skill elements needed are sufficiently integrated into TAMK's degree curriculum?
2. Which soft skill elements are important for TAMK to integrate into their degree curriculum?

In the first round, participants were asked in open-answer questions to provide their knowledge and opinions on what kind of core job skills and soft skills are needed for the future in their respective industries. The responses were then analysed and divided into common themes based on the conceptual framework.

In the second round, participants were provided with the results of the core job skills and general soft skills needed and were asked to agree or disagree with the results. An option to provide their opinion were given in open-answer questions for respondents who disagreed with the results. The general skills categories were further broken down into individual skills within the categories and participants were asked to provide their knowledge and opinion on the current sufficiency level of each skills.

5.1 Background information

There was a total of 46 companies that responded to the first-round questionnaire, out of which, 12 companies responded to the second-round. The respondents consist mainly of companies with less than 50 employees (54%, n=25), followed by companies with 201-500 employees (15%, n=7) and 50-200 employees (13%, n=6). The least respondents are from large size companies with 501-1000 employees (9%, n=4) and over 1 000 employees (9%, n=4), as shown in Table 1 below.

Table 1. Size of companies that responded.

No of employees in companies Henkilöstön määrä yrityksissä	%	n.
Less than 50 / Alle 50	54%	25
50 - 200	13%	6
201 - 500	15%	7
501 - 1000	9%	4
Over 1000 / Yli 1000	9%	4

Figure 5 below shows the types of industry that responded to the questionnaire, companies from the manufacturing industry responded the most (26%, n=12), followed by information and communication industry (17%, n=8) and wholesale and retail trade (13%, n=6). Others category consist of companies from tourism, consulting and wholesale of scraps and waste.

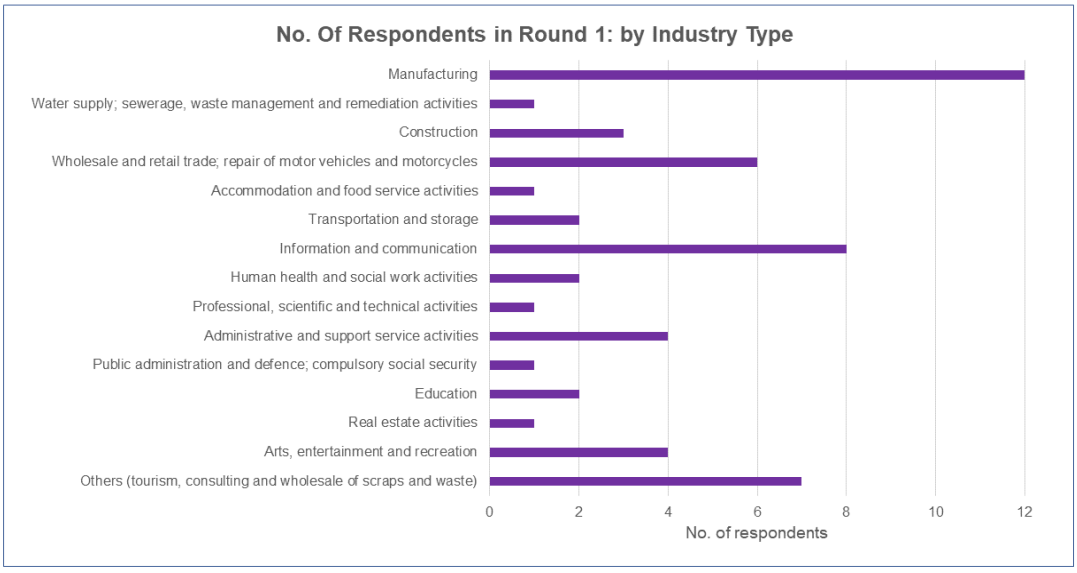

Figure 5. Types of respondents' industry

In terms of work culture of the companies, Figure 6 below shows that the biggest type of work culture are companies where employees are involved in responding to non-routine situations (28%). This is followed by employees needing to learn things at work (27%), working in a team (26%) and employees have the flexibility to choose how they work (19%).

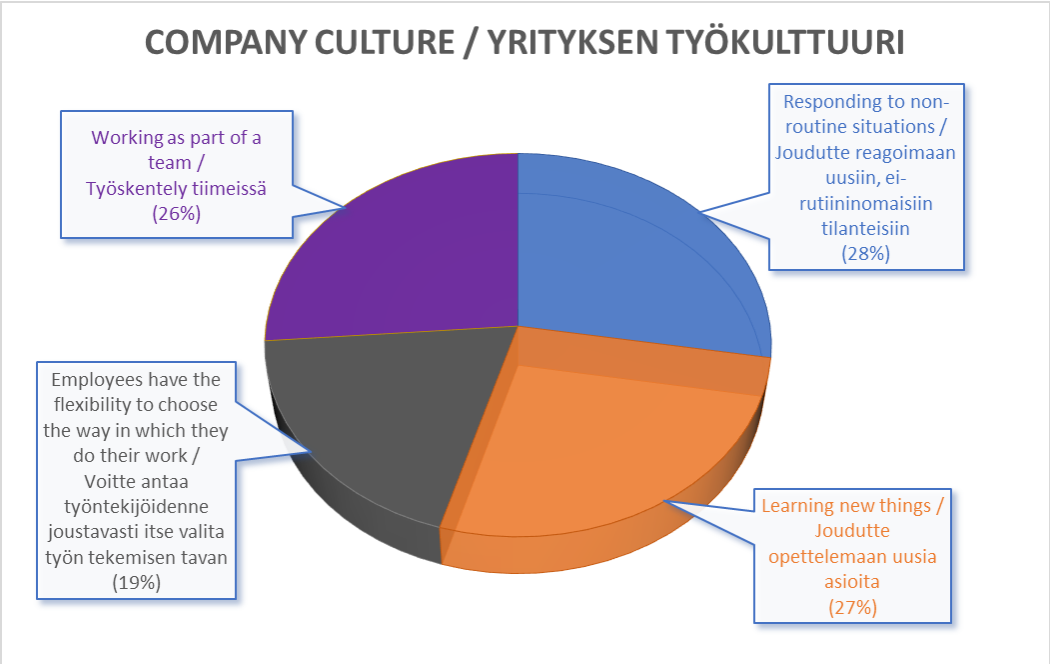

Figure 6. Types of company culture

With regards to participation of the companies in higher learning education, 59 percent (n=27) of the companies that responded cooperate with the higher learning institutions by offering internships, project works, lectures that provide real working environment information, thesis research, site visits and education fairs, as shown in Figure 7. This is encouraging as the students are able to practice both their core job skills and soft skills in a real working environment before graduating.

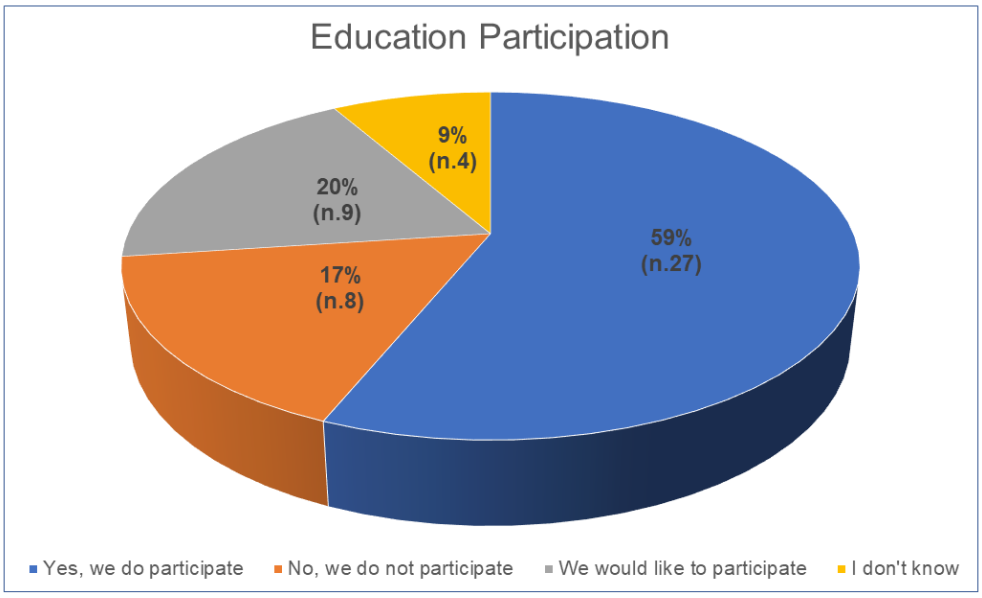

Figure 7. Companies participation in higher education.

The 17 percent (n=8) who responded that they do not participate does not see any benefit in cooperating with the higher education institution or lack resources and time. There is 20 percent (n=9) who are interested to participate and offered to partner with higher education institutions for project works, guest lecturers and technical training cooperation.

5.2 Core job skills demand for the future: Round One

In the first round, respondents were asked in open-answer questions to provide their opinion on what kind of jobs are needed in the future in Finland and within those jobs, what kind of soft skills are needed. The results, presented in Figure 8, were analysed and divided into core job skill categories based on Accenture's 'New Skills Now' report (2017) on the four defining features of the future of work, namely: Digital and Human; Cooperative and Collaboration; Knowledge and Task-based; and Flexible and Fluid (Accenture 2017, 8).

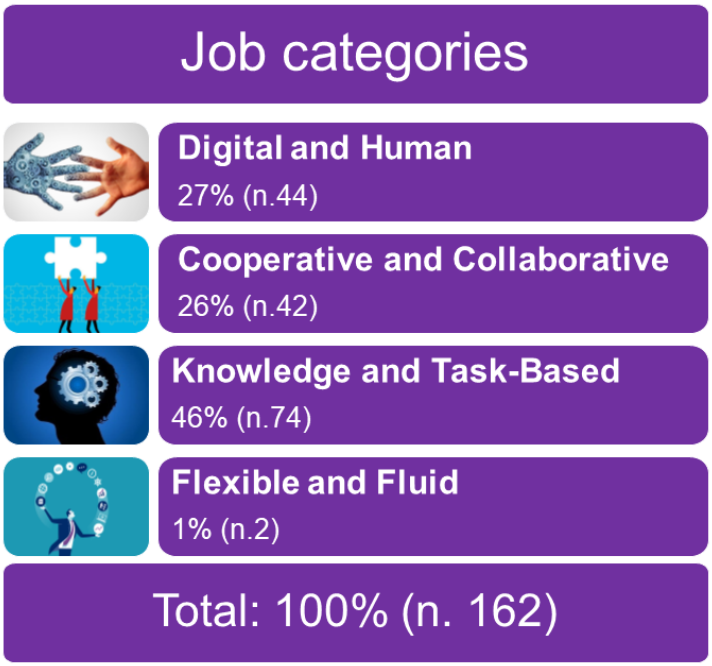

Figure 8. Results on types of future jobs needed – Round One.

5.2.1 'Digital and Human' job category

In Finland, 'Digital and Human' job category is estimated to be the second most needed in the future (27%, n=44). Jobs in this job category require an individual to work with digital technology, such as AI, machine design, ICT and robotic. Digital technologies are increasingly dominating the working environment and transforming the way of working and skills needed to do the work efficiently. Accenture reported in their 'New Skills Now' report (2017) that both human and machines will increasingly work together to drive productivity in the future. These emerging technologies will become human's co-workers as they continue to automate and enhance the work, thus generating new work activities and opportunities. (Accenture 2017, 9.) The World Economic Forum (WEF 2018) estimated that job roles which require human to work with machines will experience a growth in demand by 2022 such as Data Analysts and Scientists, Software and Applications Developers, and Ecommerce and Social Media Specialists. The analysis also discovered that there is an increasing demand for a variety of totally new specialist roles which requires the human to work with machines, such as AI and Machine Learning Specialists, Big Data Specialists, Process Automation Ex-

perts, Information Security Analysts, User Experience and Human-Machine Interaction Designers, Robotics Engineers and Blockchain Specialists. (WEF 2018, 8-9.)

5.2.2 'Cooperative and Collaborative' job category

'Cooperative and Collaborative' job category is a close third in demand (26%, n=42). This job category requires an individual to work closely together in a team or with the customers for mutual benefit or a shared goal, for example, sales, consumer experience, customer service, marketing and communications. Cooperation means working with others for a mutual benefit and collaboration means working with others to achieve the same goal. The digital economy has enabled individuals to work and communicate with each other easily with interactive tools such as social networking platform. (Accenture 2017, 10.) The World Economic Forum (WEF 2018) estimated that job roles such as Customer Service Workers, Sales and Marketing Professionals, Training and Development, People and Culture, and Organizational Development Specialists, which requires cooperation and collaborative will grow by 2022. (WEF 2018, 8.)

5.2.3 'Knowledge and Task-based' job category

Based on the result of this research, 'Knowledge and Task-based' job category is estimated to be the most in-demand in Finland in the future (46%, n=74). Examples of specialised knowledge and skills include finance, construction, machine design and social welfare. According to Accenture 'New Skills Now' report (2017), 'Knowledge and Task-based' jobs are work that utilises an individual's specific skills and knowledge. Companies are either hiring or outsourcing projects and tasks to an individual or a team with specialised knowledge and skills that are relevant to that specific industry or knowledge. (Accenture 2017, 11.)

5.2.4 'Flexibility and Fluid' job category

Only 1% (n=2) identified needs in the 'Flexibility and Fluid' job category. This category consists of jobs that enable an individual to have flexible working time and location, such as freelancers and consultants. According to Accenture's 'New

Skills Now' survey (2017), technology has uncoupled the restrictions of time and location, and this enables an individual to seek employment in geographic locations that are different from their place of living and to be able to seek more than one company. However, there are concerns in this job category about the lack and confusion regarding health and retirement benefits as highlighted by one participant in this questionnaire. (Accenture 2017, 12.)

5.3 Core job skills demand for the future: Round Two

The results of Round One were then summarised and presented to respondents in Round Two as feedback to seek validation of the results. Respondents were asked if they agree with the results on the type of core job skills needed in Finland for the future. Figure 9 below shows that majority of the respondents agreed completely (n=8), while some (n=4) agreed to some extent. Those that agreed to some extent felt there should be a higher need for jobs in the 'Flexibility and Fluid' job category, while another commented that there is too big difference between the 'Knowledge and Task-based' jobs and 'Flexibility and Fluid' jobs, assuming they feel the percentage should be much closer. Some of the respondents also felt that remote work via devices cannot replace the human contact and in large companies, the compensation for work could be more complicated.

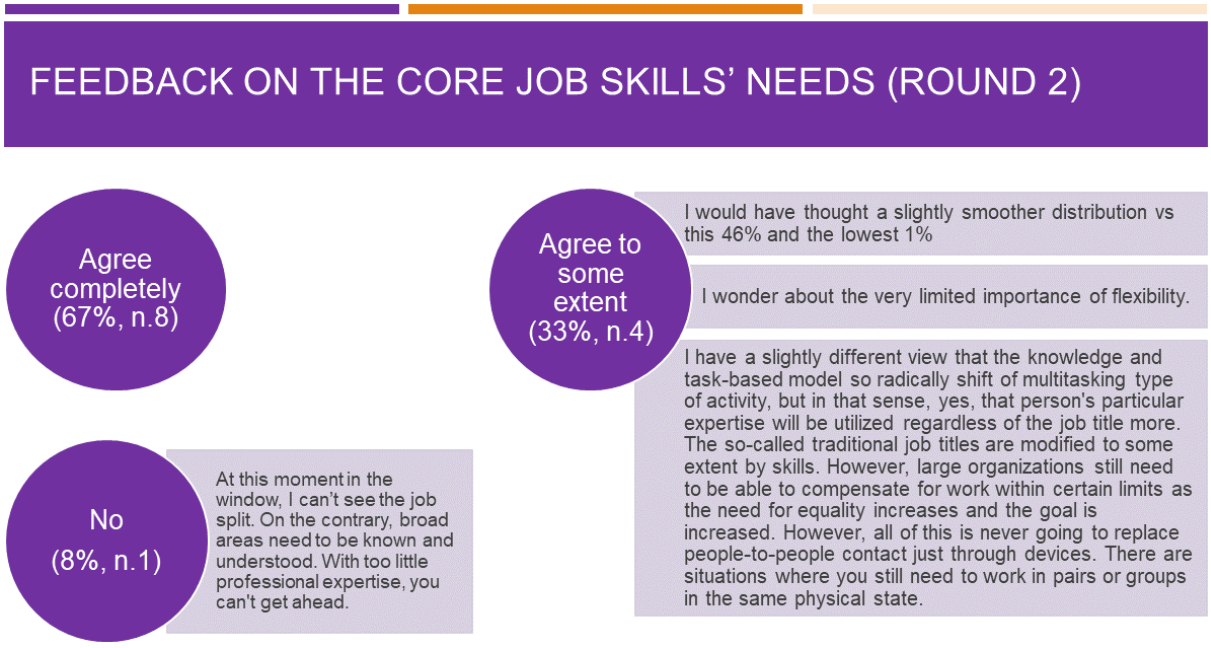

Figure 9. Round Two feedback core job skills' needs.

5.4 Soft skills for the specific job categories: Round One

In the first-round questionnaire, respondents were asked in open-answer questions about what kind of soft skills are needed for the jobs they defined in the job categories. The soft skills were then analysed and divided into the common theme using the categories defined in Accenture's 'New Skills Now Taxonomy' (2017) and then further analysed to define the specific skills needed for each job category.

5.4.1 Soft skills needed for 'Digital and Human' job category

Based on the results shown in Figure 10 below, 'Build Tech Know-How' soft skills were listed as the most important skills needed for this job category, followed very closely by 'Apply We'Q'. This shows that companies need not just an individual with technological skills but also skills that requires them to communicate and work effectively with customers or work colleagues, such as teamwork, emotional understanding, negotiation, customer relations and so forth. The skills that are somewhat important to have is the 'Cultivate a Growth Mindset', which consist of skills that require an individual to stay relevant, agile and curious. The skill category that is least important according to the research is 'Create and Solve' skills, which includes skills such as problem-solving, innovation and decision-making.

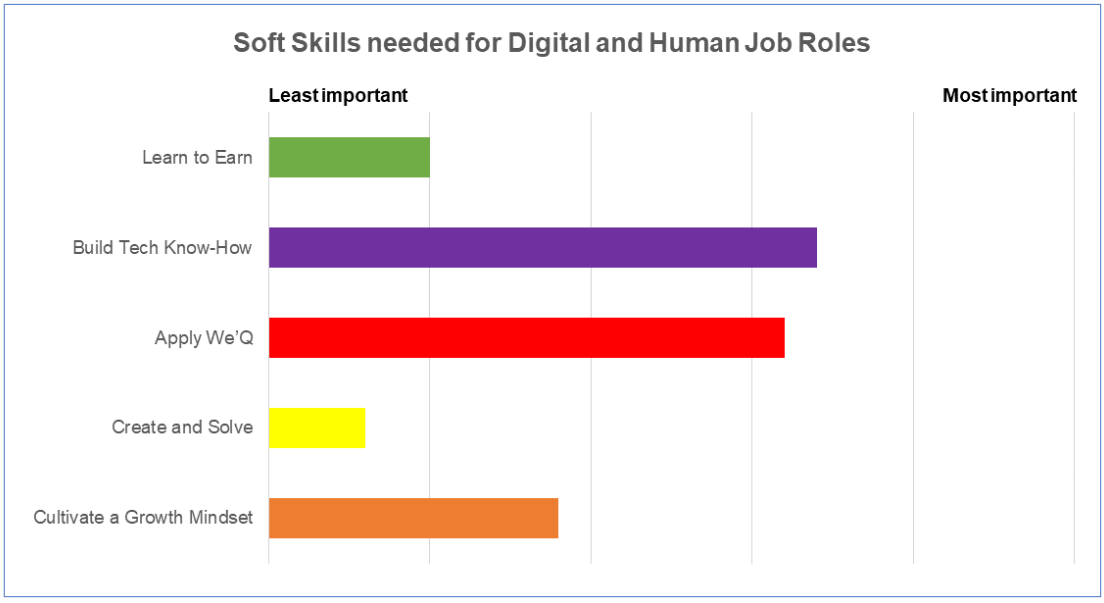

Figure 10. Soft skills needed for 'Digital and Human' Job Roles.

5.4.2 Soft skills needed for ‘Cooperative and Collaborative’ job category

Based on the results shown in Figure 11 below, ‘Apply We’Q’ soft skills were listed as the most important. This means that the most important soft skills needed for job roles such as sales, customer service and marketing are communication, presentation, teamwork, and emotional understanding. Other skills in the ‘Create and Solve’, ‘Learn to Earn’ and ‘Cultivate a Growth Mindset’ skill sets, such as flexibility, problem-solving, creativity and critical thinking, are somewhat important. ‘Build Tech Know-How’ skills were the least important, however, it does not mean that these non-technical job roles do not require the technical knowledge but just the basics and how it works will be sufficient enough for them to present and communicate with their customers.

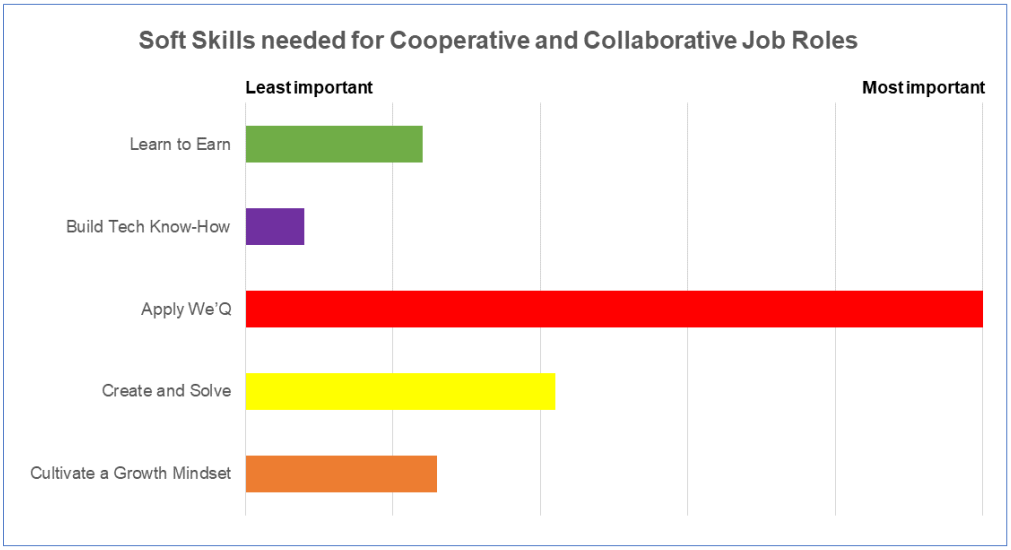

Figure 11. Soft skills needed for ‘Cooperative and Collaborative’ Job Roles.

5.4.3 Soft skills needed for ‘Knowledge and Task-Based’ job category

For ‘Knowledge and Task-Based’ job roles, ‘Apply We’Q’ soft skills were listed as the most important, followed closely by ‘Create and Solve’ soft skills, as shown in Figure 12. ‘Learn to Earn’ and ‘Cultivate a Growth Mindset’ were listed as somewhat important, while the least important skills are ‘Build Tech Know-How’. This means that soft skills such as communication, collaboration, emotional understanding and teamwork is the most important in these job roles, followed by skills such as decision-making, problem-solving, critical-thinking and planning and execution.

Figure 12. Soft skills needed for 'Knowledge and Task-Based' Job Roles.

5.4.4 Soft skills needed for 'Flexible and Fluid' job category

Based on the results, shown in Figure 13 below, it seems the 'Flexible and Fluid' job roles are not commonly needed in Finland, very few recognised this as a possibility for jobs in the future, only 1% (n=2) of the respondents recognised and identified the need for this type of job roles. 'Create and Solve' soft skills were listed as the most important, followed by 'Apply We'Q' soft skills. 'Cultivate a Growth Mindset' were listed as somewhat important, while 'Learn to Earn' and 'Build Tech Know-How' were listed as not needed.

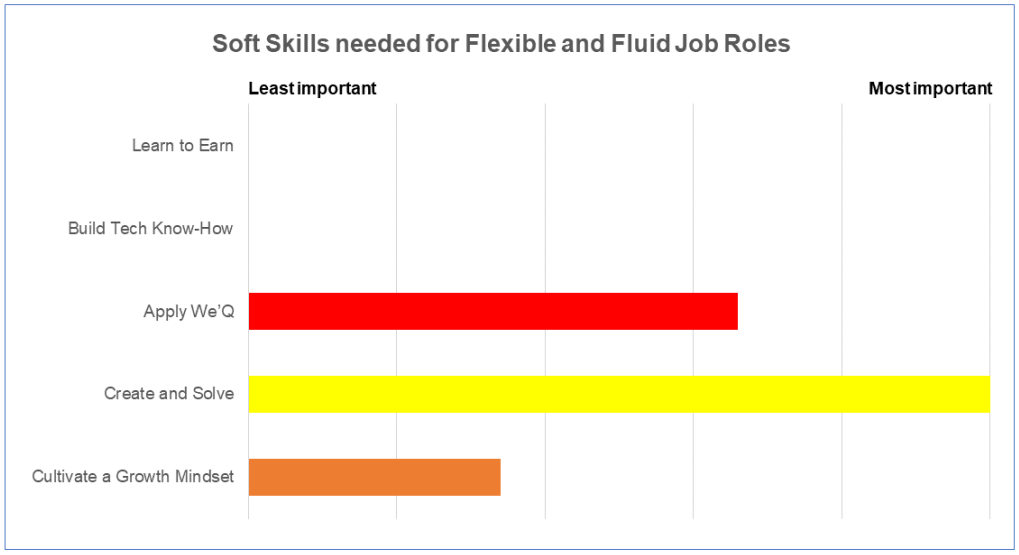

Figure 13. Soft skills needed for 'Flexible and Fluid' Job Roles.

5.5 General soft skills for the future: Round One

General soft skills are skills that companies in Finland would like their employees to have, irregardless of their job roles. In Round One, 46 companies responded to the questionnaire and participants were asked on the kind of skills in general that a company view as important in their employees. 'Apply We'Q' was listed as the most important followed closely by 'Learn to Earn' and 'Cultivate a Growth Mindset', as shown in Figure 14 below. This means that skills such as teamwork, communication, basic IT and language skills, flexibility, curiosity and willingness to learn new things are the basics skills an individual need to gain employment. 'Build Tech know-how' was listed as the least important as these skills are not needed for jobs that do not specifically require the person to work in a technical or specialist role.

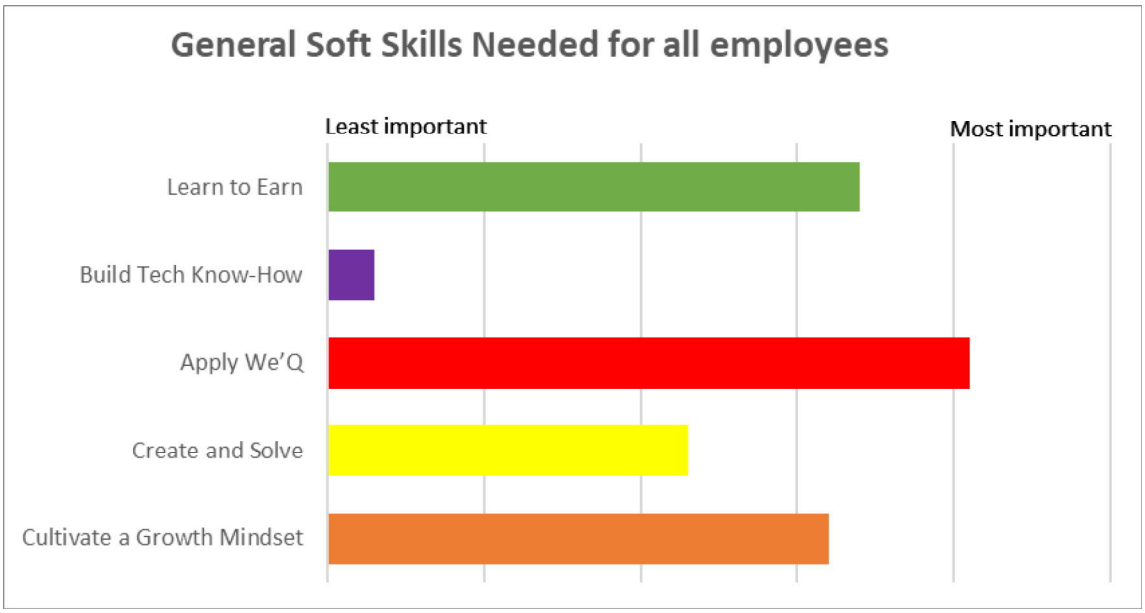

Figure 14. Round one results on general soft skills needed.

5.6 General soft skills for the future: Round Two

In Round Two, 12 companies responded to the questionnaire and participants were asked their opinion on the results in Round One for the general skills needed for employment. Majority of them (75% n=9) agreed completely on the type of skills needed in general, while 25% (n=3) thinks technology skills are more important than shown in the results in Round One. None of them (0% n=0) disagreed on the results. The 25% (n=3) that agreed to some extent also believes

that technology skills should have more importance, while one of them have misunderstood the purpose of the research, which is not to study the skills lacking in job seekers but to anticipate the future needs to prepare the students for future employment. Details of the results are presented in Figure 15 below.

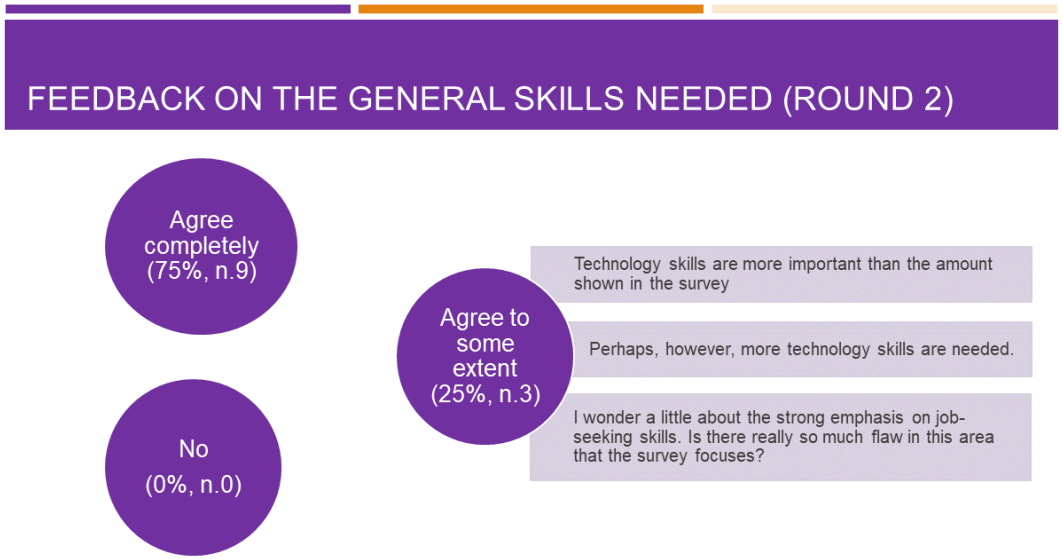

Figure 15. Round Two results on general skills needed.

5.7 Current skill level in the general soft skills

In round two of the questionnaire, the participants were also asked to rate the current skill levels of each skill identified in round one within the soft skills categories in terms of sufficiency. Participants were asked to rate which skills are not sufficiently taught in the current education and which skills are sufficiently taught and reflected in their employee.

'Build Tech Know-How' skill category was not included in the second-round questionnaire as this is a technical skill which is pre-dominantly needed only in jobs that specifically requires the specific technical knowledge.

The results will provide TAMK with information to determine which kind of soft skills to implement, improve or build into the degree curriculum and which skills have been well-covered in their study curriculum.

Figure 16 below shows the overall scoring for the general soft skills categories which was calculated from a scale of zero as the most sufficiently covered and 10 as the least sufficiently covered. The results indicated that while all the skills are sufficiently covered, it still needs improvement, with soft skills in 'Create and Solve' category needing the most attention. Skills in 'Learn to Earn' category is the most sufficiently covered skill sets amongst these four soft skills categories.

Figure 16. Overall scoring of the current soft skill level for general skills.

In summary, soft skills such as teamwork, presentation, basic IT, language and ability or willingness to learn new things are adequately covered in education. This means that the higher learning education has implemented these skills successfully in their degree program curriculum. These skills should not be ignored but should be continuously adapted in the course modules as they were identified as important skills for future employment.

Respondents were also asked if there were other soft skills which they felt were important and not covered in the research. Figure 17 illustrates the respondents' opinion on other soft skills they felt that it is also important for an individual to develop which would be an advantage in the general working environment. These include:

- Self-efficacy, which means an individual should have the confident and trust in their own capabilities to handle different situations independently
- Respectful of others, which means treat your co-workers with courtesy and politeness and encourage them to express their opinions and ideas
- An individual who is just starting to work should understand that one does not start immediately at the top but must develop their competencies and

skills as they gain experience before progressing in their career development.

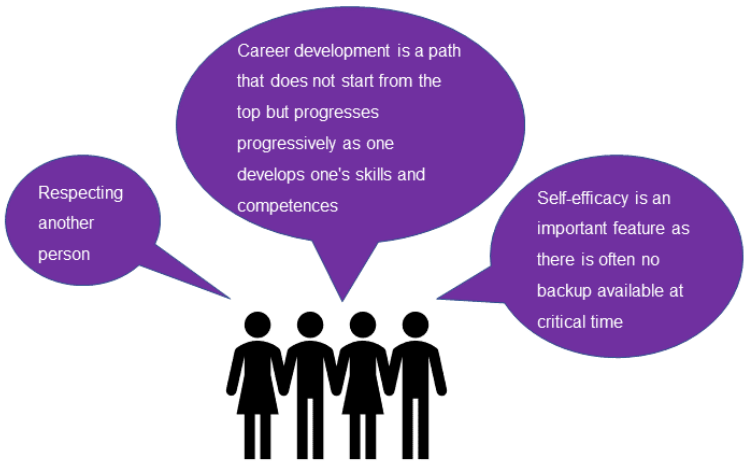

Figure 17. Other soft skills needed.

The following provides in-depth information on the types of soft skills identified by the respondents and their sufficiency within each category. Higher numbers indicate that the skills are not covered sufficiently, and lower numbers indicate that the skills were sufficiently covered and shown in the employees.

5.7.1 Soft skill level within 'Apply We'Q' skill category

The results, shown in Figure 18 below, indicated that the majority of the skills are currently adequately covered, especially teamwork; interaction and networking; and presentation skills. However, the skills that need improvement on the curriculum are negotiation, emotional understanding and leadership.

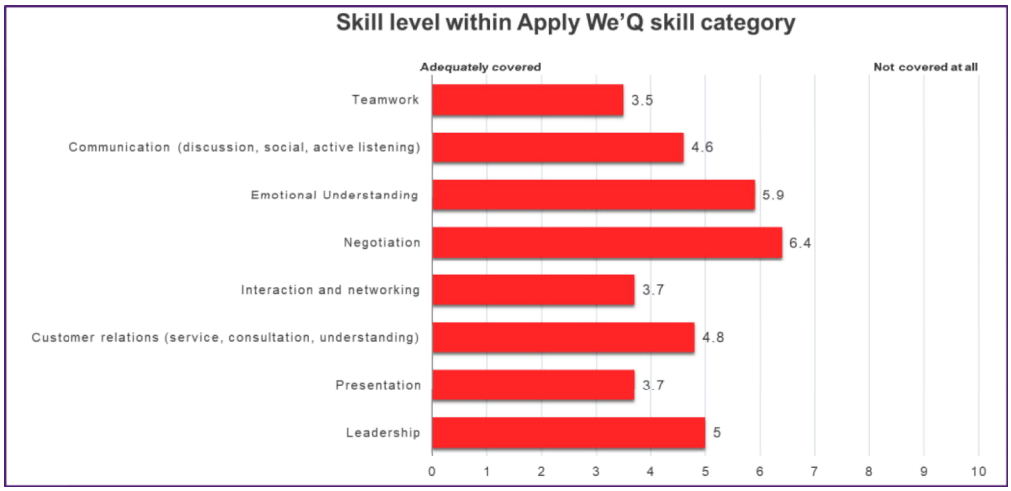

Figure 18. Current soft skill level within the 'Apply We'Q' category.

5.7.2 Soft skill level within ‘Learn to Earn’ skill category

Based on the results shown below in Figure 19, reliability, basic IT and language skills are adequately covered and the rest of the skills identified will need some improvement, especially commitment and a basic understanding of business and working life.

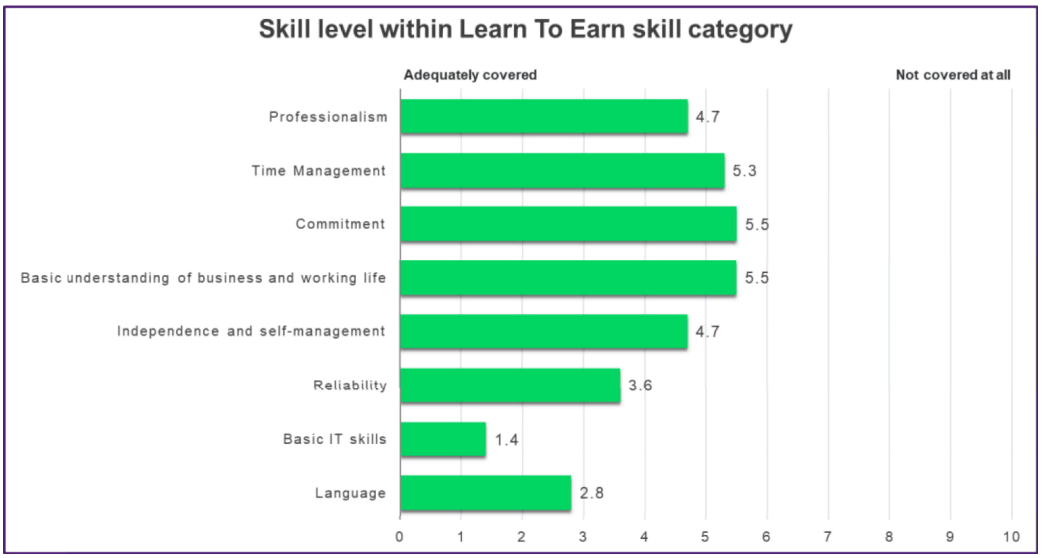

Figure 19. Current soft skill level within the ‘Learn to Earn’ category

5.7.3 Soft skill level within ‘Cultivate a Growth Mindset’ skill category

The skills in this category are somewhat covered, as shown in Figure 20, especially the ability and willingness to learn new things. However, most of them require more improvement, with the biggest improvement needed in individual learning to be perceptive. In the business sector, perception means being able to anticipate, analyse or forecast future business needs or looking at a strategy from a long-term perspective. In the marketing sector, it means being perceptive to a customer’s needs and proposing a solution based on those needs.

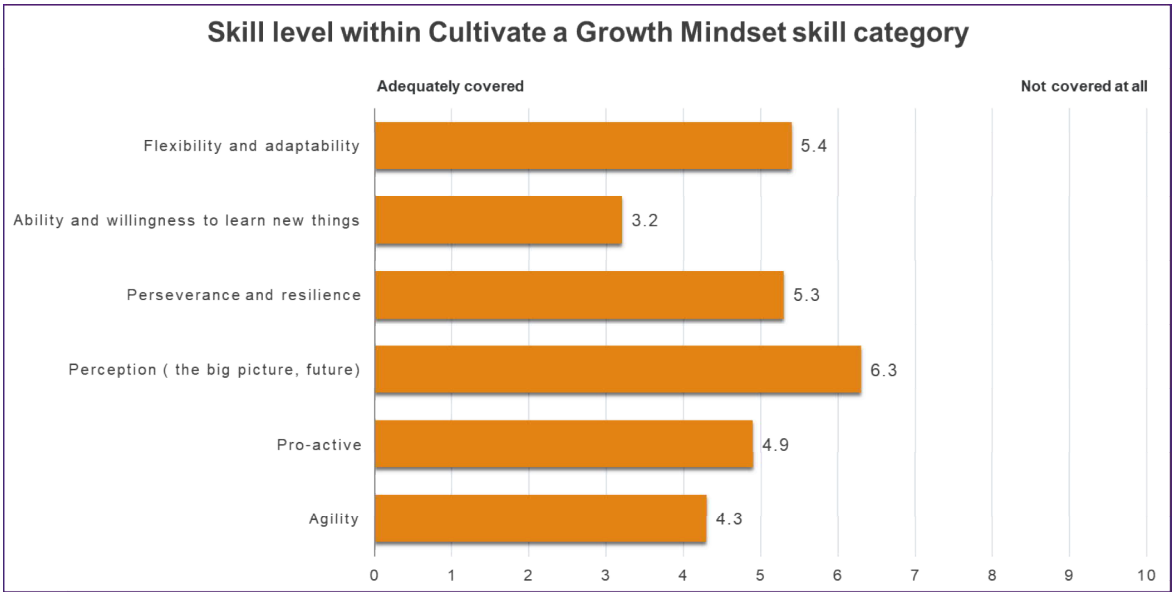

Figure 20. Current soft skill level within the 'Cultivate a Growth Mindset' category

5.7.4 Soft skill level within 'Create and Solve' skill category

All the skills identified in this category are somewhat adequate, as shown in Figure 21 below. However, improvements are needed in all the skills identified, especially problem-solving.

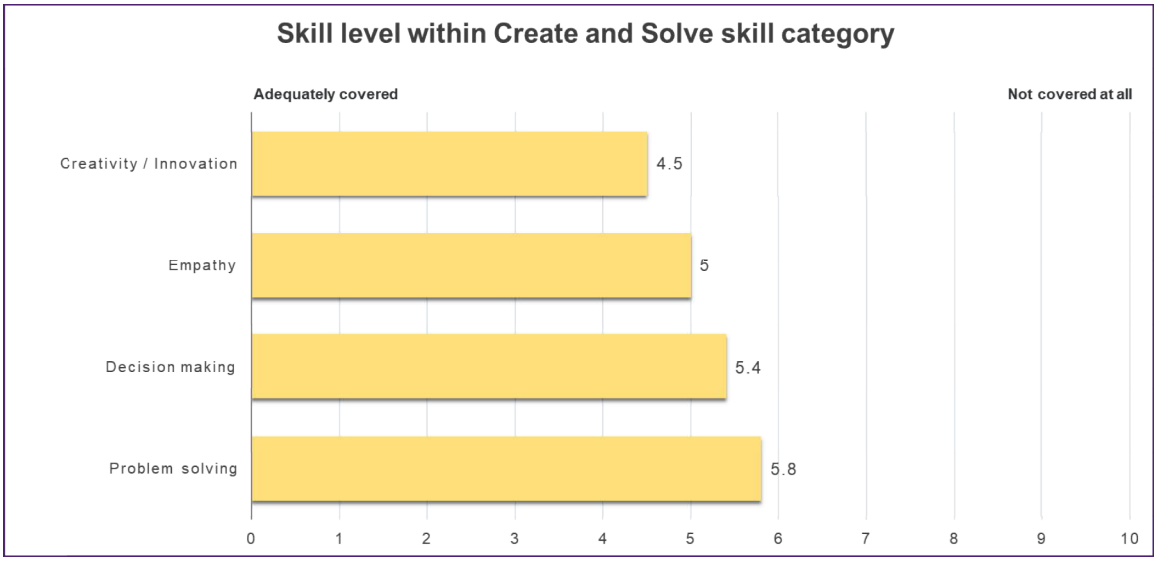

Figure 21. Current soft skill level within the 'Create and Solve' category

6 RECOMMENDATIONS AND CONCLUSIONS

Over the years, as technology evolves, many companies are turning to new technologies to improve efficiencies accuracy and cost-saving, as well as, expand globally to new markets and compete effectively for consumers globally. Therefore, as new technologies emerge and automation of human tasks increase, the labour market will undergo transformations. This leads to considerable attempts from experts to seek how humans can fit and work in this digital era and there are many theories and reports which presents the kind of job skills that an individual must possess to survive and compete in a digital economy. For many years, even before the digital era, many experts have also reported researches and theories on the importance of soft skills which are needed to complement the core job skills that an individual possesses. Theories of those soft skills have also evolved from the non-digital era to the current digital era.

The educational institutions must continuously be pro-active and adjust their education curriculum to meet the needs of the future market to prepare the students for the future work environment. Therefore, this research seeks to find out what are the core job skills and soft skills needed in the future for Finland in order to assist TAMK in planning their degree courses and curriculum.

6.1 Recommendations

6.1.1 Core job skills of the future

Based on the results and feedback in both rounds shown in Figure 8 and 9 in Research Findings, the biggest needs in Finland are jobs in the ‘Knowledge and Task-Based’ job category (46%, n=74). This means that an individual need to develop a specific knowledge or job skills, for example, financial management, project management and architecture. Horizons (2019) predicted that future works will gradually shift from permanent or temporary and time-based workers to task-based. By using a digital platform, companies can publish their needs and workers can either bid for the work or companies can set a price for the work and select an individual or a team for the work. Task-based work relies heavily on the individual’s knowledge, skills and expertise for the work and compensation

can also rely heavily on the individual's reputation. The digital labour platform will also be able to measure and provide scoring for the individual's credibility, performance, skills and feedbacks from previous employers. (Horizons 2019.)

The second biggest needs in Finland are jobs in the 'Digital and Human' category (27%, n=44), which requires machines and human to work together. In the digital economy, AI will change the way work is done, how it is done and who is doing it. Wilson and Daugherty in Harvard Business Review (2018) revealed that companies which achieve the most significant performance improvements are those that have both humans and machines working together, for example, work using interpersonal communication, such as customer service, empathy and emotion is done by humans as it is challenging for AI to do and deciphering data which is challenging for humans are done by AI. Human and digital that collaborate, and work together will complement each other's strength as every business need both these capabilities to achieve positive results and efficiencies. (Wilson & Daugherty 2018.) Responses from the employers in the WEF 2018 Future of Jobs report (2018) suggested that businesses can utilise some of the automated tasks to complement and enhance the human's correlative strengths, which ultimately will lead to the empowerment of the human's full potential and competitive advantage. Rather than just narrowly focusing on automation for efficiency and cost savings, a company can broaden the scope by considering value-creation tasks that can be achieved by humans which complements the automation. (WEF 2018, 10.)

'Cooperative and Collaborative' job category was forecasted as the third most needed in the future for Finland (26%, n=42). According to Lucas' blog (2018) in Hult International Business School, teamwork will play an important role in the future working environment. In this fast-moving digital economy, companies will shift from the traditional hierarchical job roles to dynamic teams that can respond to new challenges, innovate and solve problems effectively and efficiently, therefore an engaging team works more effectively. According to Lucas, research by Gallup revealed that engaging employees are 22% more productive, with 65% less turnover and 41% fewer defects. (Lucas 2018.)

These results will provide a general insight into the types of jobs needed in the future and enable TAMK to plan and decide the type of degree programs they could offer. Further research can be conducted based on the degree programs TAMK is currently offering or planning to offer in the future. Similar research should be conducted on the specific type of jobs the degree offers and the representation group can be targeted to those specific industries. Thereafter, TAMK can plan the individual degree program based on the feedback of the companies in the specific industries. It is also recommended to include the soft skill elements into the specific degree program curriculum to educate and provide real-life experience to the students in order to prepare them for those jobs.

6.1.2 Soft skills of the future

Just having the core job skills is not enough to be competitive in a market where there are many graduates with the same qualifications and experience. An individual can stand out amongst the crowd by developing and enhancing their soft skills. This research identified the important soft skills needed for each of the job categories, as well as the general soft skills needed to be competitive in the job market and efficient in the workplace. Despite most work being transformed into automation in the digital economy, there are still job roles and soft skills which digital cannot deliver well, such as empathy, creative thinking and emotional understanding. Therefore, it is important for educational institutions to help the students develop these soft skills.

To understand the soft skills needed for the job roles identified for the future, a map of what the companies anticipate in the research is laid out in Figure 22 for four different job roles within each specific job role categories, namely, Digital/ICT Engineer (Digital and Human job category), Customer Relation Manager (Cooperative and Collaboration job category), Finance Manager (Knowledge and Task-Based job category), and Consultant (Flexible and Fluid job category). The mapping design is based on Accenture's 'Skills Family Mastery' figure in their 'New Skills Now' report (Accenture 2017, 31).

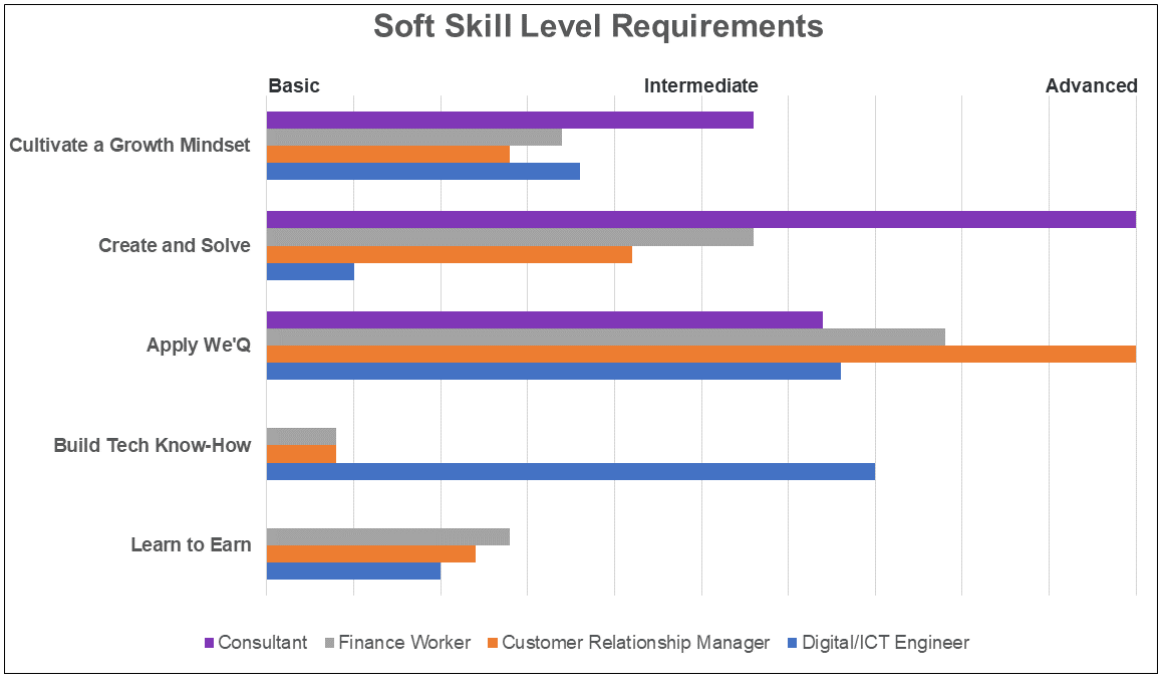

Figure 22. Soft skill mastery level for job roles (Accenture 2017, modified).

As this research was conducted on a general level, different companies may have different requirements on the level of soft skills needed for the jobs, for example, in 'Human and Digital' jobs, some may just require application or code testing while another company may require the specialist to create an application or a digital platform. Therefore, the level of skill requirements could differ vastly which could influence the average level in the results. An in-depth research can be conducted with the specific industry or industries, in which a graduate could be employed based on TAMK's degree program, to gather further information on the soft skills and level of soft skills needed for those jobs.

Participants were also asked about the soft skills needed in general to gain employment for the future working environment in Round One and Round Two, participants were asked if they agree with the results. Based on the results shown in Figure 14, TAMK could integrate the soft skills in their degree program course modules, so that these skills are adopted, used and learned by the students during the course of the degree program. Some of the more important skills could be integrated into the mandatory modules so that all the students have a chance to develop these skills as they go through the modules.

Based on the initial Round One feedback, the soft skills were identified in each of the skill categories and participants were asked in Round Two to provide their opinion on the current skill levels of the skills within each of the skill categories. Figure 23 below provides a summary of the soft skills that TAMK should pay attention to as those are the skills that participants have identified as currently insufficient in education. The higher the score, the more attention it needs as those are the soft skills which are not sufficiently covered in education.

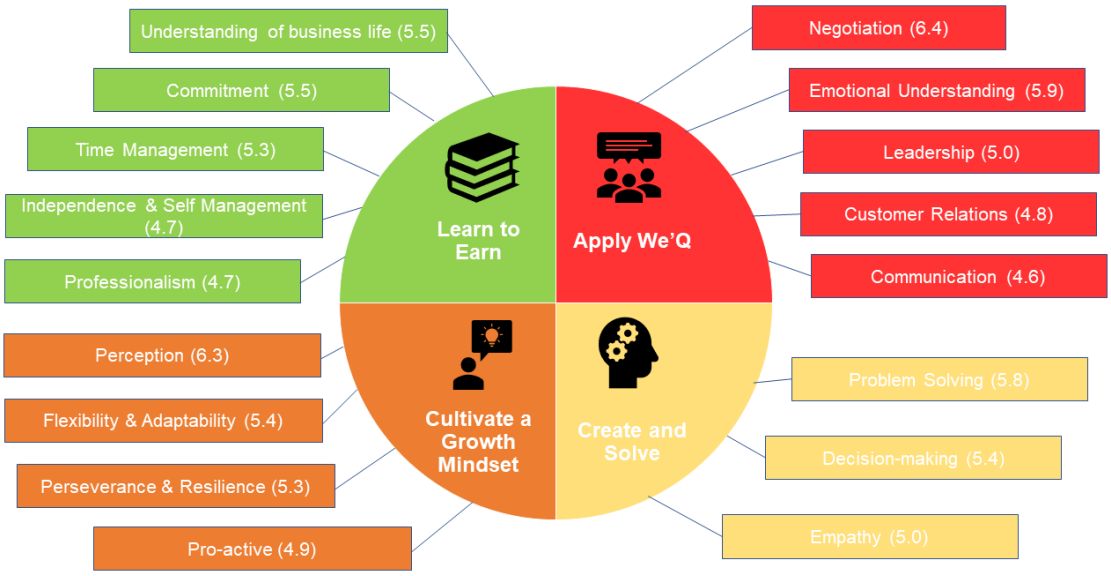

Figure 23. Summary of general soft skills needed in education.

With these findings, TAMK can create awareness to the students on the importance of developing the soft skills along with the core technical skills, on which kind of soft skills are important for the future working environment in general. TAMK can introduce and inform the students which general skills are important based on these findings and which skills will be integrated into all course curriculum during Orientation or the Professional Development sessions.

As for the soft skills for the specific job categories, lecturers can explain which soft skills are integrated into the specific course and why it is important to build those soft skills along with the knowledge of the core technical course.

6.1.3 Cooperation with companies

TAMK has always been cooperating with different types of companies in different industries to educate and prepare their students for the real working environment through strong collaboration and partnership. Based on the findings above, TAMK could seek new or continue to collaborate with specific industries that can offer internships, projects or real-life learning experience for the students, in order for them to develop and experience real-life working experience on the specific jobs and this will also enable the students to develop their soft skills.

TAMK could include the appropriate companies in their meetings when planning which skills need to be integrated into which course curriculum. The companies can help identify and provide a more reliable feedback and opinions on what kind of core job skills are important in their industry and what kind of soft skill sets would be important to integrate into those jobs.

TAMK could also invite specific companies in different industries that are related to the degree curriculum to discuss with the students on their career aspirations and out of that, what kind of technical and soft skills the students would need to learn and equip to ensure that they will be employable after graduation.

6.2 Conclusion

It is undeniable that the higher education institution plays an important role in preparing their students for the future working environment. This means that TAMK should be pro-active by equipping their students with transferable skills and knowledge that enable them to compete in the future labour market. While the results of this research did not produce a consensus agreement on the level of core job skills and general soft skills needed in the future, the findings did identify the type of core job skills and soft skills that is relevant for the future working life environment in Finland.

According to Accenture's survey titled 'Finding the skills for Finland's future' (2014), with Finland's rapid progress in the business perspective, companies are

looking for new ways to function more seamlessly, achieve new efficiencies, increase productivity and meet growing customers' expectation. Therefore, the future work-life environment will not only need the core job skills, but it will also involve the usage of soft skills such as problem-solving, creativity, agility and entrepreneurship. (Accenture 2014, 24.)

To quote Ulf-Daniel Ehlers in The Future Skills Report (2019), "What plays out in the future depends on decisions taken today, which can critically narrow the room for manoeuvre over time." (Ehlers 2019, 8). With this in mind, the higher education institution needs to consider their long-term goals in their current decision plans on their degree curriculum. While no one can predict the future of the working environment, TAMK can look at the current changes that are taking place and consider the changing environment which demands a different way of working. (Ehlers 2019, 8.)

7 LIMITATIONS AND DISCUSSION

As with any thesis writing, there are always challenges and limitations during the process of the research for the thesis which are discussed here.

7.1 Limitations

There were a few limitations when conducting this research which could affect the reliability of the data.

There was no control over the type of companies and respondents to send to. The mailing address relied on the head of degree programmes in TAMK and Tampere Chamber of Commerce forwarding the questionnaire to their customers. Furthermore, there was limited contact information to send the questionnaire to. Ideally, the questionnaire should be sent to a group of identified experts from different types of industries to ensure that all industries are covered to get a more accurate idea on types of future jobs and soft skills needed in Finland. This means that the results may or may not be based on the opinions of experts from specific industries.

Lack of respondents in different industries in terms of quantity means the results does not show the percentage of all actual needs in Finland, for example, there could be an industry which may have the most needs in the future but did not respond, therefore the needs are not taken into consideration. Alternatively, a specific industry could be heavily represented in the research, therefore the result will be biased and show a bigger percentage of their needs for certain core job skills.

Since personal interview with a selected panel of experts could not be conducted due to limitation in time and language barrier, the research relied on the respondents understanding the purpose and questions in the online questionnaire. This means few respondents could have either misunderstood or did not read thoroughly certain aspect of the questions and purpose of the research despite the explanation in the introduction. There could also be more resources to seek and

target a more specific group to represent the representation group in the industries in order to gain more reliability in the research.

The literature review and concepts used was conducted in English, but in order to gain more respondents, it had to be translated into Finnish. This means certain concepts or ideas could be lost in translation and respondents misunderstood certain ideas and concepts of the research.

The questionnaire could not be targeted to graduates or alumni of TAMK who are currently working since the person who handles the alumni cannot send nor provide contact details of the alumni for this research purpose. This means that this research could not collect perceptions of the graduates who could give better insights of future jobs from a new graduate perspective as well as, compare their work with the sufficiency of their education and skills acquired in TAMK.

7.2 Discussion

The initial plan after discussion with the commissioner of this research was to recruit a student who could assist in the research, preferably a person who can help with the Finnish language. However, due to time constraint, this was not possible, and this research was conducted only with the assistance of the thesis coach for translation. If a second student were recruited, it would have also been possible to collect more in-depth and reliable feedback and opinions by conducting a personal interview with selected participants from the responding group. As such, the research relied on everyone and anyone who took the time to response and there is no control over the background, expertise or experience of that participant.

However, despite the limitations in the language and control over the responding group, the questionnaire was still offered to participants in two languages with 42 companies who responded to the first round and 12 of those 42 companies responded to the second round. The reward of a small token of appreciation for participants who responded to both rounds helped a lot in encouraging participants to answer the questionnaire.

The results provided TAMK with a general idea on the future needs of the core job and soft skills that are important in the future working life environment in Finland. For more reliable information with regards to the level of needs for the core job skills, TAMK could select certain experts from the responding group and contact them to conduct a discussion or interview to get accurate information on the future needs in their respective industries.

The findings in this research were driven by the type of companies that responded to the first part of the questionnaire and the same participants did not necessarily respond to the second part of the questionnaire. In order to gain a more reliable result, probability representation should be adopted, and the same respondents should respond to the second part of the questionnaire. TAMK does not need to target all the businesses or industries represented, instead they should just target businesses that is related to degree programs offered in TAMK.

While this research answers the questions on the type of core job skills and soft skills needed for the future in general, it has not been possible to pinpoint specifically on the level of needs. While majority of the respondents agree on the type of jobs and soft skills needed, the level of importance differs with different industries depending on the job types and needs of the industries. Further research can be conducted by organising a group of students to work individually or as a team, divided by industries to find out importance and level of skills needed for the core job and soft skills identified in this research.

Overall, the research was able to identify the type of core job skills and soft skills needed for the future working environment in general. In order to find out more specifically the type of job roles and level of need, further research or discussions can be conducted with targeted industries. By targeting the experts within the specific industries, TAMK will be able to get a more reliable information on the importance and level of needs. By acquiring more in-depth and reliable information, TAMK can plan more accurately on degree programs that will be important for the future working environment, as well as, which kind of soft skills are important to integrate in both the degree programs and general curriculum to help the students build those skills for the future working environment.

While it has been frustrating at times especially during the initial phase of the research, where the lack of Finnish language skills and lack of resources has been challenging, the thesis research has been an interesting and educational journey. Extensive literature review and the empirical research has provided a general idea of the future core job skills and soft skills needs in Finland.

Last but not least, acknowledgement has to be given to the thesis coach, Tuula Andersson, whom without her help in translations and guidance, the research would have been next to impossible and TAMK commissioner, Hanna Pihlajarinne, for the opportunity to conduct a research on the future skills needed in Finland.

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APPENDICES

Appendix 1. Questionnaire: Round 1

Future Skills Research

Tampere University of Applied Sciences (TAMK) is oriented towards preparing the students for their future working life. Accenture conducted a survey in 2014 with Finnish companies and students, and the survey concluded that graduating with a degree does not necessarily guarantee a person has the necessary soft skill competencies to do the job successfully or to adapt successfully in the working environment.

It is important for TAMK to be pro-active and include in its curriculum, the kind of soft skills the companies in Finland require from their employees in order to ensure that our students are employable after graduation.

Therefore, the purpose of this study is to determine what kind of soft skill elements TAMK could improve or implement in their degree curriculum to prepare the students for the real working environment in the next five or more years. The aim is to equip the students with the appropriate skills that is needed in the working environment based on your feedback.

(continues)

First, we would like to get to know more about the company you represent. This section aims to find out what kind of **future job roles** are needed by companies in Finland in this rapid pace and technological world which has led to automation of most of the routine and manual job roles.

How many employees does your company have?*

- ○ Less than 50
- ○ 50 - 200
- ○ 201 - 500
- ○ 501 - 1000
- ○ Over 1000

Which industry does your company represent based on the Standard Industrial Classification TOL 2008 (https://www.stat.fi/meta/luoki...)?

You can choose up to 2 main industries.*

- ☐ Agriculture, forestry and fishing
- ☐ Mining and quarrying
- ☐ Manufacturing
- ☐ Electricity, gas, steam and air conditioning supply
- ☐ Water supply; sewerage, waste management and remediation activities
- ☐ Construction
- ☐ Wholesale and retail trade; repair of motor vehicles and motorcycles

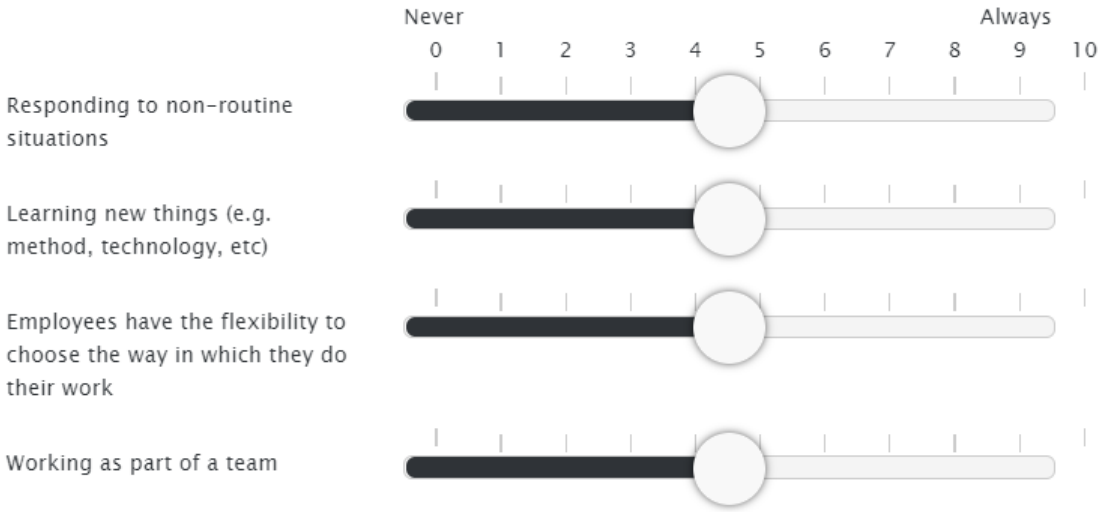
(continues)

- [ ] Transportation and storage
- [ ] Accommodation and food service activities
- [ ] Information and communication
- [ ] Financial and insurance activities
- [ ] Real estate activities
- [ ] Professional, scientific and technical activities
- [ ] Administrative and support service activities
- [ ] Public administration and defence; compulsory social security
- [ ] Education
- [ ] Human health and social work activities
- [ ] Arts, entertainment and recreation
- [ ] Other service activities
- [ ] Activities of households as employers; undifferentiated goods- and services-producing activities of households forown use
- [ ] Activities of extraterritorial organisations and bodies
- [ ] Others, please specify:

Please describe shortly the type of business the company is involved in this industry (eg. Bio & circular economy, digitalisation, agrotechnology etc)

(continues)

How often, if at all, is the company involved in the following?



What is your company's point of view in participation of students education?*

- [ ] Yes, we do participate – how and what?
- [ ] No, we do not participate – why not?
- [ ] We would like to participate – how?
- [ ] I don't know

What kind of job roles and responsibilities do you see your company needing for the future, in order to succeed in 5 or more years? (You can list more than 1 job role, if different roles are needed)*

(continues)

5(7)

Next, we would like to find out more about the skills needed for those jobs you mentioned. At this point, we would like to encourage you to take a moment, have a cup of tea or coffee, envision yourself in that job role and think what kind of skills would be helpful for those job roles. You can list the type of skills for each of the job roles needed.

This section aims to find out what kind of soft skills elements would those future job roles require in order to meet the business' needs and succeed in the company (eg. Team work, flexibility, leadership and so on)

In your opinion, other than the hard skills required to do the job(s) you listed, what kind of **soft skills** are needed? (Please list the soft skills for each job, if more than 1 job role is needed in the future, e.g. customer analyst: psychological skills)*

What kind of **soft skills, in general,** would the company expect from the graduates from the higher education institute?

(continues)

6(7)

Finally, we would like to get some background information about yourself.

What is your job title (eg. Marketing manager)?*

Approximately how many years have you been working in the industry your company represents?*

- 0 - 2 years
- 3 - 5 years
- 6 to 10 years
- Over 10 years

Which age group do you belong?*

- Generation Z (less than 25 years)
- Generatio Y (25 - 40 years)
- Generation X (Over 40 years)

(continues)

We would like to thank you for taking the time to complete this study.

There will be another round of query in this research where we will tell you about the results and ask your opinion on some specific questions. We will send you the link right after we have the results.

For all those who have responded in both rounds of the survey, we have reserved a small token of gratitude for you. In order to be able to send it to you, we need your contact information. Giving them is completely voluntary and will not affect your answers in the analysis.

Please provide your contact info here:

Your name	
Street address	
Postcode and City	
Email address	
Telephone number	

Appendix 2. Questionnaire: Round 2

Future Skills Research Results

A total of 46 responded to this survey and we would like to thank you all for responding to our 1st round of survey.

In the next pages, you will find some of the results, in which we would also like to hear about your opinion on the results. This Round 2 survey will enable us to validate the results and provide us with more insights.

Please remember to fill in your contact details again at the last page after you have responded to Round 2, so that we are able to send you our small token of gratitude for assisting us to improve the future skills of the graduates.

Below are the results for the type of job roles needed for the future in Finland, in which we need your opinion to validate the results.

Job Features / Työn Peruspiirteet	n.	%
Digital and human Ihminen ja digitaalinen	44	27
Cooperative & collaborative Ihmisten välinen yhteistyö	42	26
Knowledge and task-based Osaamis- ja tehtäviäperustaiset	74	46
Flexible and fluid Joustavuus ja mukautuvuus	2	1
Total Yhteensä	162	100

Job Categories (Based on Accenture's New Skills Now report 2017):

Digital and human: Consist of job types where people and machines work together to create, drive and improve productivity for the companies, eg AI, robotic, ICT, machine design, technology.

Cooperative and collaborative: Consist of job types where people are working as a team in a company, with customers or technology for mutual benefit or a shared goal, eg customer service, customer experience, technical sales, marketing communications, social media marketing and consumer experience.

Knowledge and task-based: Consist of individuals or teams with specialized or unique knowledge and skills relevant to a specific industry, technology and timeframe, eg project management, logistics, construction, industrial, social welfare, management, administration and media.

Flexible and fluid: Consist of people or team who are flexible and fluid in doing different tasks for different companies irregardless of geographic locations, types of industry, eg freelancers and consultants.

(continues)

Do you agree with the results on the types of jobs needed for the future in Finland?*

- [ ] Yes, completely
- [ ] Yes to some extent, why?
- [ ] No, why?

Below are the general skills needed and it is the skills that companies in Finland would like to have in all their employees, irregardless of their job roles. We would like to find out your opinion on which types of skills are currently adequate for employment and which ones the education would need to develop more in their students.

To find out more details on the skills categories, please refer to the notes at the bottom of this page.

(continues)

Skills Categories (Based on Accenture's New Skills Now report 2017):

Learn to Earn: Minimum literacy, numeracy, language and digital literacy competencies required to locate, evaluate, create, transact and share content digitally. It also includes basic employability skills, conduct and practise, such as learning to maintain eye contact in an interview, listening and time management; as well as core cognitive functions, such as focused attention, working memory and sequencing.

Build Tech Know-How: This is a skill and know-how to use, manipulate, work with and/or create technologies and data. It includes the ability to use digital devices and platforms to analyze, explore and share data and to work effectively alongside machine intelligence. This requires an understanding of how technology and data can be built, manipulated and applied.

Apply We'Q: A skill needed to interact, build relationships and show self-awareness to work effectively with others in person and virtually, it consists of teamwork, collaboration, communication, social and emotional intelligence, and the ability to manage others, as well as cognitive functions such as self-regulation which allows individuals to understand, control and adapt their emotions and behaviors in a team environment.

Create and Solve: This is a skill used to approach problem solving creatively, using empathy, logic and novel thinking. It consists of creative problem solving, critical thinking, reason and logic to assess and analyze problems, and an entrepreneurial mindset. This skills family also includes cognitive functions such as decision making and the ability to plan and execute a goal.

Cultivate a Growth Mindset: This is a skill that allows you to stay relevant, be agile and curious, continuously learn and adapt to the pace of change. It includes the ability to cultivate curiosity, openness, a growth mindset and the capacity for lifelong learning. Underpinned by the cognitive function of flexibility these skills are building blocks for personal resilience and the ability to cope with and adapt to change.

(continues)

Based on the results above, **Apply We'Q** is the most important, followed closely by **Learn to Earn, Cultivate a Growth Mindset and Create & Solve skills** and these skills would be the foundation when applying for any jobs in Finland.

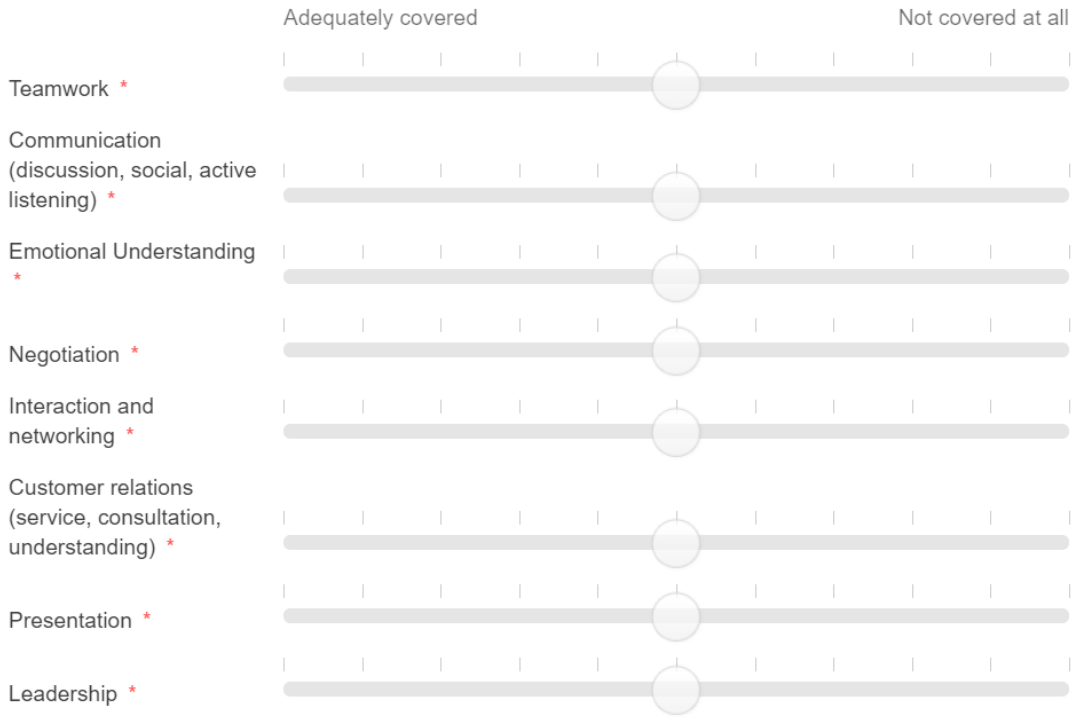
Build tech know-how skills are not needed but would be an advantage in any jobs applied.

Do you agree with this?*

- [ ] Yes, completely
- [ ] Yes to some extent, why?
- [ ] No, why?

Within the **Apply We'Q** skill category, the following skills were identified in the survey. In your opinion, which skills are not sufficiently taught in the current education and which skills are sufficiently reflected in an employee?*

Please move the ball to the left or right, according to the level that reflects your opinion, i.e. the most right would mean that the skill is not reflected in the employees at all.



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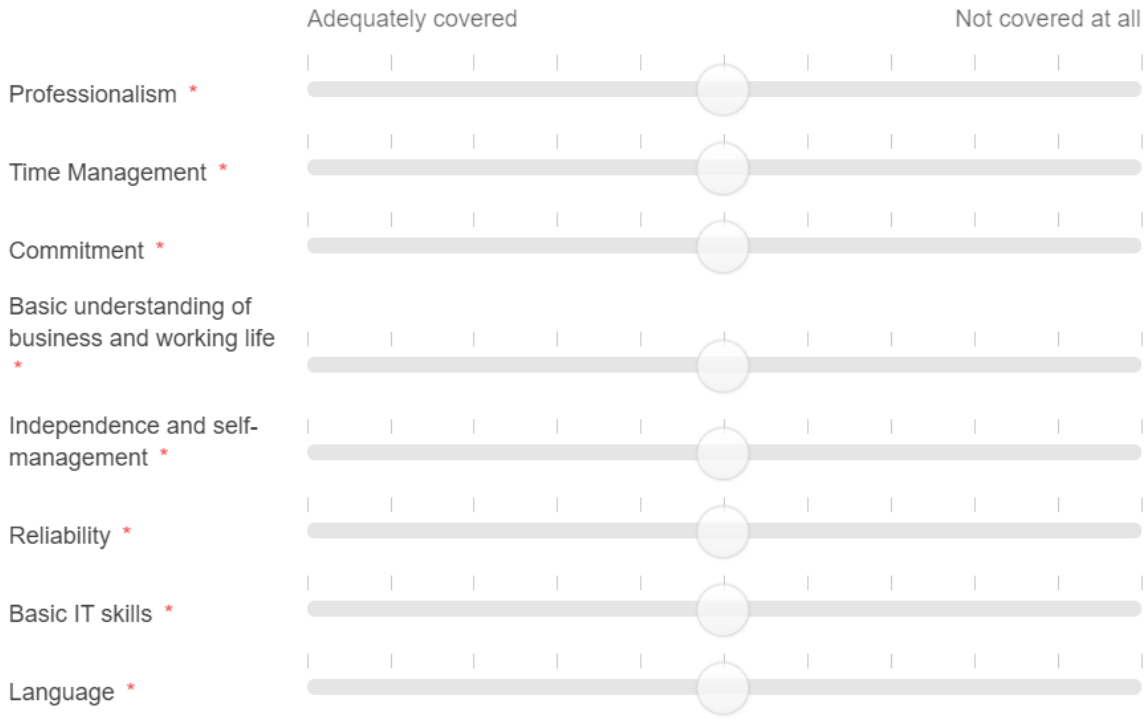
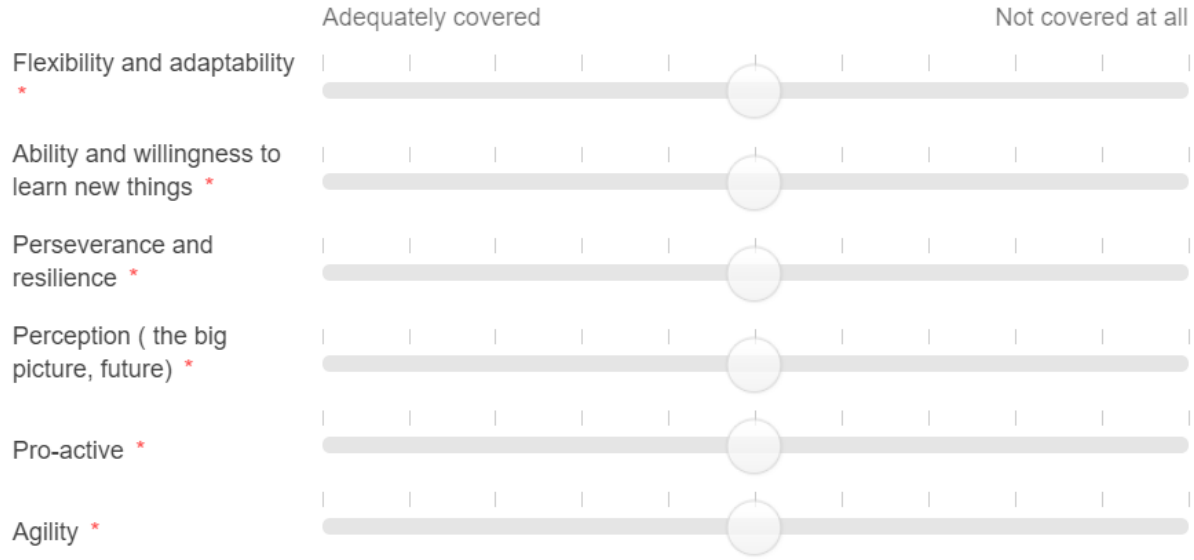
Within the **Learn to Earn** skill category, the following skills were identified in the survey. In your opinion, which skills are not sufficiently taught in the current education and which skills are sufficiently reflected in an employee?*



Within the **Cultivate a Growth Mindset** skill category, the following skills were identified in the survey. In your opinion, which skills are not sufficiently taught the current education and which skills are sufficiently reflected in an employee?*



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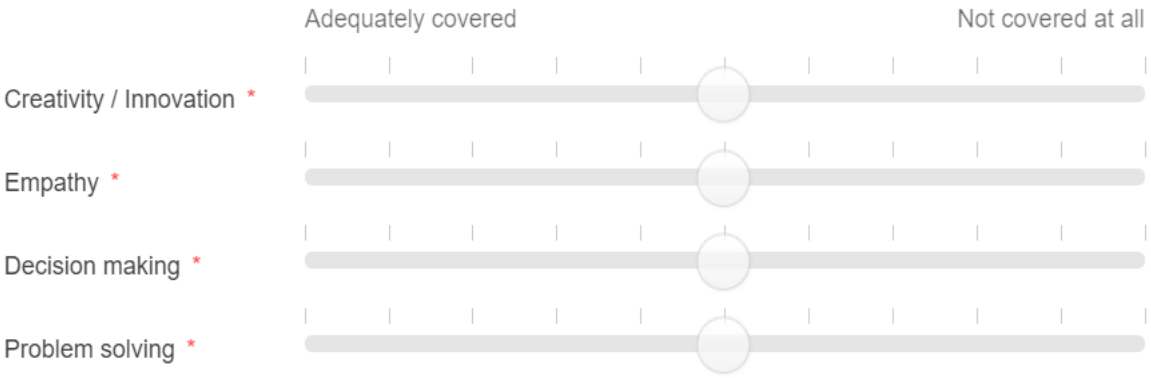
7(8)

Within the **Create and Solve skill category**, the following skills were identified in the survey. In your opinion, which skills are not sufficiently taught in the current education and which skills are sufficiently reflected in an employee?*



Are there any other skills overall that is not identified, in which you feel is important for the future employees in general?

(continues)

We would like to thank you for taking the time to complete this study.

Please do fill up your details again for us so that we can send you a token of our gratitude for taking the time to assist us in this survey.

Please provide your contact info here:

Your name	
Street address	
Postcode and City	
Email address	
Telephone number	