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Expertise, best practices
and teaching in Digital Era

IO1-A1.3 – National Need analysis Desk Research

Finland National Report

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1. Introduction

Big changes in the world economy, technology and health require new methods and new skills to manage in the new normal. Digital transformation of industries and society is a key element for growth,

entrepreneurship, job creation and welfare. For Interaction and being social people have to use digital channels and digital skills. Global challenges are access, E-readiness and attitude from face to face interaction to virtual. How to make sure that the access of all regions and persons will have this access and needed skills? How to make sure sharing of information and not developing the same things many times?

Finland has been ranked as one of the leading countries in several digital transformation related assessments[1]. According to the Commission's annual Digital Economy and Society Index (DESI) Finland was ranked in the first position in 2020 with the score 72,3. DESI monitors the digital performance of EU Member States and tracks their progress in digitalisation (the maximum score is 100).[2]

Finnish society and companies are going more digital. The changing demand of the working life demands upskilling and continuous learning. To increase employment level and opportunities the schools are in key roles. Why to go digital and what impacts do a digital organization expect in the near future? Finnish companies define digital work in two different ways: 25 % of the answered companies saw digital as nearly synonymous with technology or only related to investments in IT. On the other hand, almost half saw it as a holistic business development mindset and an organizational culture rather than a set of concrete activities. Mostly 86 % of companies had addressed digital transformation in their strategies. Interestingly, compared to the enterprises, the public sector respondents gave greater emphasis to the key role digital transformation plays.[3] There are different support activities on the society and organisational level, such as Suomidigi and Digituki.

Finnish national report aims to describe the background and political programs guiding the digital transformation in Finland (chapter 2). The main object of the report is identifying local situation and good practices of digitalization (chapter 3). Chapter 4 identify will describe training models and successful methodologies to integrate into the school digital, methodological and socio-relational skills requested by the digital era.

[1] Digital Finland Framework
[2] https://vm.fi/en/-/finland-retains-top-position-in-eu-digital-comparison
[3] How Finland is embracing digital transformation

2. The impact of digital transformation in Finland

2.1 Political background

According to digitalization in the EU, Finnish government started to implement the general development of the digital era by the action plan of government 2016. Finnish government had five strategic priorities in the Government Programme to bring the Finnish economy onto a path of sustainable growth and higher employment and to safeguard sufficient financial resources for public services and social protection. These priorities were materialized in the 26 different key projects that also included digitalization. The programme was implemented during 2015–2019 in the educational sector during different key projects. Digitalisation was the aim for 2025[4].

2.1.1. Promotion of the digitalisation in Finland 2020-2023

The new Finnish Government's program sets the goal that Finland will be on the top of digitalisation and technological development are developed and implemented across administrative and industry boundaries. The aim is to increase the technological and digitalisation capacity of the public sector and to develop public-private partnerships. The Ministry of Finance set the Program for the Promotion of Digitalisation on 25 February 2020[5]. This program will support and encourage public authorities to make their services available to citizens and businesses in digital form by 2023.

The goals of the program by 2023 are:

- High-quality digital public services are available to citizens and businesses at least in accordance with the requirements of the Act on the Provision of Digital Services.
- Paperless office: The paper and business dealings of business people have decreased significantly, and a number of digital-only business services are available.
- Digital support is available throughout the country and is being developed to serve business people as well.

In addition to the program to promote digitization, other means of the government program to achieve the goals of digitization are:

- National Artificial Intelligence Program AuroraAI
- Service and business network reform
- Digital Identity Development Project

[4] https://valtioneuvosto.fi/hallitusohjelman-toteutus/digitalisaatio
[5] https://vm.fi/digitalisaation-edistamisen-ohjelma

The budget of the program (2020 – 2023) is 7,6 million euros. In addition to the funding of the program, EUR 1.4 million has been allocated for the regional development of digital support for 2020 and EUR 1.6 million for 2021.

2.1.2. The Digital infrastructure strategy

The ministry of Transport and Communication has a plan for 2025, The Digital infrastructure strategy, which means that Finland wants to be among the top leaders in communications networks. The digital infrastructure must enable living, working and entrepreneurship across Finland.[6]

2.1.3. Policy actions for digital transformation

There are two concrete policy actions defined by the Finnish Government: platform economy focused "Finland in platform economy" and an AI focused "Finland a leader in the application of artificial intelligence".

The categories are as follows:

- ensure novel technologies can be adopted more quickly and easily by industry
- ensuring future-oriented digital skills
- ensure availability of public funding and investments for digital transformation
- ensure international collaboration in all aspects of digital innovations

2.2 Research

The Finnish Research and Innovation Council, chaired by the Prime Minister, is committed to a vision where Finland is the most attractive and competent environment for experiment and innovation in 2030. In this roadmap, the target for public and private sectors' investments in research and innovation is set to four per cent of the GDP. In national perspective, the key importance is in Business Finland's (national innovation funding organization) co-innovation funding and focused innovation programs such as Smart Energy, Smart Mobility, Smart Healthcare, and AI and Platform Economy. The deep and close co-operation between research and companies is further strengthened and innovation funding emphasizes knowledge transformation from research to business.

6 https://www.lvm.fi/en/-/digital-infrastructure-strategy-turning-finland-into-the-world-leader-in-communications-networks-985076

The fundamental research, development and innovation programme ICT 2023 is jointly coordinated and funded through Academy of Finland and Business Finland with a view to further improving Finland's scientific expertise in computer science and promoting the extensive application of ICT. The budget of the Academy used for 2020 to implement the ICT 2023 programme was at least 10 million euros. The aim of the 'ICT Technologies for the Digital Transformation of Industry' projects is to support the creation of new techniques and technologies to enhance the digital transformation of industry.[7]

The research is aimed at achieving significant leaps in existing industrial processes and at creating completely new types of processes, methods and technologies that yield superior benefits compared to current activities. Key to this is the development and utilisation of ICT technologies in new ways, for example smart sensors, big data analysis, customer service and customer profiles, augmented reality, cloud computing, mobile devices, IoT platforms, positioning technologies, human-machine user interfaces, authentication and counterfeit detection, and 3D and 4D printing.

According to the Global Competitiveness Report, Finland has the best availability of scientists and engineers in the world combined with one of the most digitally oriented population[8]. The Finnish education system is one of the best globally and ICT specialists' share of the workforce (6.7%) is one the highest as well.

Therefore, the research and development are focused on technology and higher education. The education system is renewed, and more and more young promising students continue their studies to the University of applied sciences or even University to be a researcher.[9]

2.3 Finnish national digital scenario

The Finnish Government aims to increase the technological and digitalisation capacity of the public sector and to develop public-private partnerships, as well as support and encourage public authorities to make their services available to citizens and businesses in digital form by 2023. Preconditions for its fulfillment will be created through the digital infrastructure strategy, through different research programs and special funding.

The Digital infrastructure strategy determines objectives for the development of the digital infrastructure in Finland by 2025 with promoting wireless connections and the construction of

[7] https://webcache.googleusercontent.com/search?q=cache:o29sxGA4RqAJ:https://www.aka.fi/globalassets/10rahoitus/ict2023/ict_2023_teollisuus_2020_en.pdf+&cd=4&hl=fi&ct=clnk&gl=fi&client=firefox-b-d

[8] https://www.weforum.org/reports/the-global-competitiveness-report-2020/in-full

[9] https://www.lvm.fi/en/-/digital-infrastructure-strategy-turning-finland-into-the-world-leader-in-communications-networks-985076

fixed connections as well as with other technologies supplementing the data communications infrastructure.

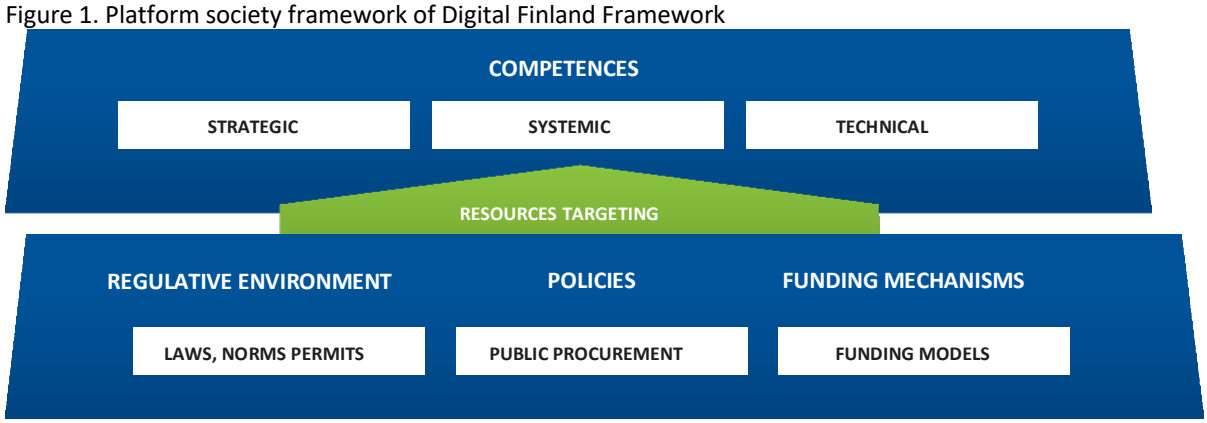
Digital Finland Framework supports effective coordination of sustainable digital transformation in Finland through combining the future opportunities based on the global megatrends and sustainable development goals with the digital innovations exploiting the benefits of platform economy and the transformation of the spearhead industry sectors.

Digitising, digitalisation and digital transformation are concepts that are sometimes mixed or intentionally broadened or constricted. According to the VTT's report A review of digitalisation in the Finnish manufacturing SME companies (2020)[10] digital transformation is the way to digitise a product, services or processes. Digitalisation means the implementation of processes or services via information and communication technologies (ICT).

In Finland competitiveness and growth is heavily dependent on networks of larger and smaller companies, interacting closely with the research sector, universities and research institutes. Digital platforms enable every piece of data, software and service belonging to a larger ensemble; as well are an outstanding means to deploy and further develop new enabling technologies and applications (AI, IoT, 5G and cyber security).

The Digital Finland Framework presented the follow Platform society framework (Figure 1)[11] with a combination of strategy, political programmes, budget, ecosystems, experimentations and continuous learning.

Figure 1. Platform society framework of Digital Finland Framework



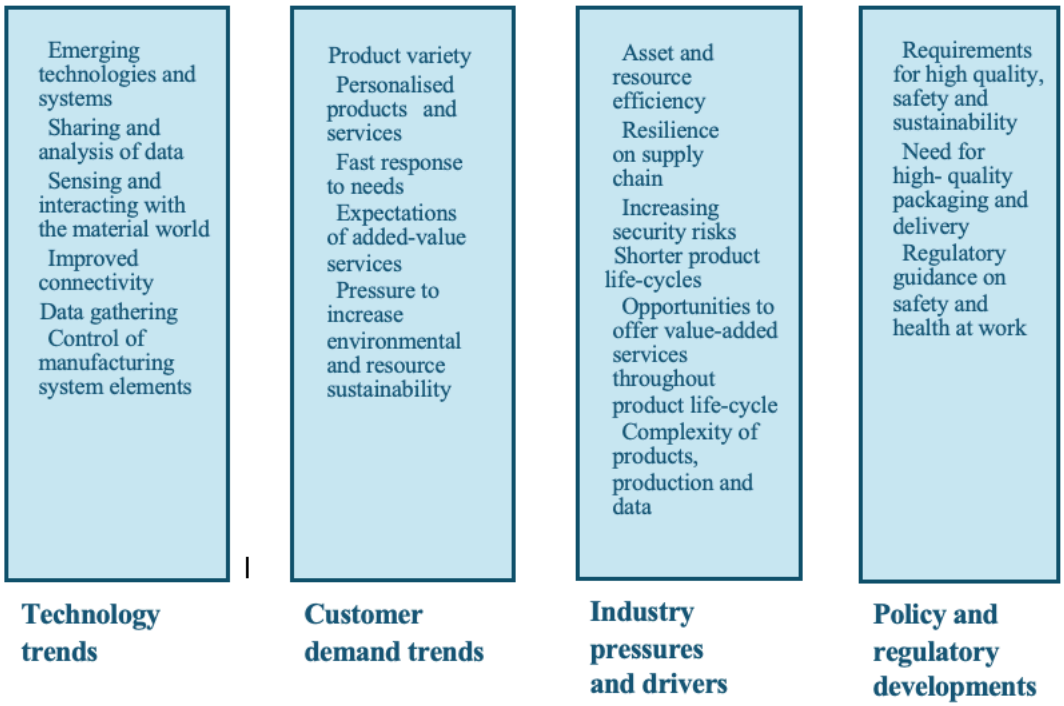
[10] https://webcache.googleusercontent.com/search?q=cache:o29sxGA4RqAJ:https://www.aka.fi/globalassets/10rahoitus/ict2023/ict_2023_teollisuus_2020_en.pdf+&cd=4&hl=fi&ct=clnk&gl=fi&client=firefox-b-d

[11] Digital Finland Framework

2.4 Crucial future skills

In Finland, the price of human work is high[12]. In order to survive in the global competition, it is necessary to convert human tasks to robots or robot process automation which can efficiently carry out tasks that are straightforward and do not require human intelligence. To stay competitive in the global markets the products and services have to be available 24/7. Digitalisation will change the business models of companies, web shops and e-services.

Figure 2. Four trends driving digitalisation according to the VTT Technical Research Centre of Finland[13]



Digital transformation is the top priority and key enabler in the near future. The European Commission has agreed on the Green Deal and is willing to invest in the transition to a climate-neutral, green, competitive and inclusive economy. The Technology Industries of Finland published a roadmap to the zero-carbon industry (2020) about digital solutions needed to address the entire lifecycle of the industry as follows: raw materials and energy; production and processing; usage, maintenance and logistics; recycling.[14]

[12] https://webcache.googleusercontent.com/search?q=cache:j4iYrg-nIMkJ:https://cris.vtt.fi/files/42494175/Digitalisation_in_Finnish_manufacturing_SMEs_final.pdf+&cd=4&hl=fi&ct=clnk&gl=fi&client=firefox-b-d

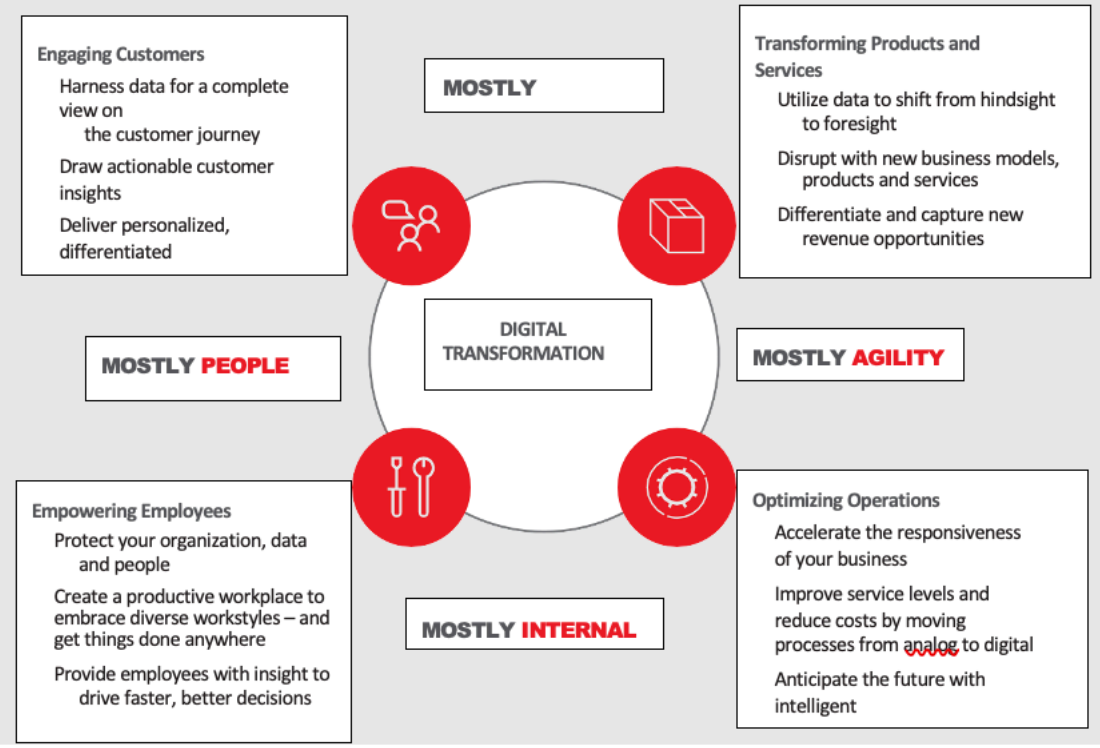
[13] https://webcache.googleusercontent.com/search?q=cache:o29sxGA4RqAJ:https://www.aka.fi/globalassets/10rahoitus/ict2023/ict_2023_teollisuus_2020_en.pdf+&cd=4&hl=fi&ct=clnk&gl=fi&client=firefox-b-d

[14] https://teknologiateollisuus.fi/fi/vaikutamme/kestava-kehitys/teknologiateollisuuden-vahahiilitiekartta-ratkaisuja-ilmastohaasteeseen

According to the Finnish National Forum for Skills Anticipation and future scenario until 2035 digitalisation and technological development play a central role. New jobs will emerge especially in high-tech companies and in the processing and marketing of highly processed products from the point of view of the development of cost-efficiency and ecological sustainability. There were identified three-level skills needed: generic skills, common working life skills and skills specific to vocational fields.[15]

Microsoft Finland made a short review from expectations of Finnish enterprises and organisations about the most important goals of the digital transformation. According to these results (Figure 3) the organisations pointed to creating deeper customer relationships, empowering employees to work better, transforming products and services as well optimize operations. There's a big difference between enterprises and public organizations: Enterprises emphasize the outward-looking areas of customer engagement and product and service development, while public organizations stress the importance of the internal areas of employee empowerment and operational efficiency.

Figure 3. The most of important goals of the digital transformation according to the Microsoft[16]



[15] https://www.google.com/search?client=firefox-b-d&q=osaaminen+2035

[16] How Finland is embracing digital transformation

Thus, for best development in the future, the Finnish enterprises expect to invest in and prioritization within AI, IoT, robotics, AR/VR, blockchain and 3D printing. In the public sector, robotics has everyone's attention. (Table 1.)

Table 1. Technologies respondents think most influential in next 5 years (%)[17]

Technologies	Enterprises %	Public sector %
Artificial Intelligence	82	80
Internet of Things	76	40
Robotics	53	100
Augmented/Virtual Reality	29	40
Blockchain	29	40
3D printing	24	
Drones	12	

According to Table 1 the AI will be the most disruptive technology within the next five years.

For support of digital transformation in Finnish society there are different supportive activities, for example 'digituki' digital support persons in organisations[18] and Suomidigi (https://www.suomidigi.fi/). The aim of Suomidigi is to provide the opportunity to share information, support, and tools to help digital service designers, creators, and decision makers build more streamlined and customer-centric services, thus none of the developers of digitalisation in the public sector would be left alone in their work.[19]

[17] How Finland is embracing digital transformation
[18] https://www.suomidigi.fi/teema/digituki
[19] https://www.suomidigi.fi/

3. Digital Finland

3.1 DESI ranking

Finland has been ranked as one of the leading countries in several digital transformation related assessments[20]. According to the Commission's annual Digital Economy and Society Index (DESI) Finland was ranked in the first position in 2020 with the score 72,3. DESI monitors the digital performance of EU Member States and tracks their progress in digitalisation (the maximum score is 100). 76 per cent of the population has basic or above basic digital skills, which is considerably above the EU average 58 per cent.[21]

According to digital public services Finland ranks fourth among the EU countries, primarily thanks to the higher number of e-government users. Finland also performs well in relation to the availability of pre-filled forms, online service completion and open data. The large number of users of digital public services indicates accessible and usable access to digital services.

3.2 Finnish eGovernment

The digital transformation of Finnish society is happening fast. One example of the digital revolution is the Government's key project aimed at digitalising public services.

Finland is leading the way in digital government (eGovernment). It is also a global front-runner in this field. The government agencies are implementing artificial intelligence (AI) technologies and other new technologies for improving public services, as well as streamlining government support functions. The public services will be primarily digital in the future.[22]

The Government is accelerating the development of better services by creating ecosystems, both public and private sector, around peoples' life events and the life cycles of businesses. The Government is also building customer-centric cross-sectoral service models for people and companies arriving in Finland.

Trust is a pivotal factor for successful digital government. In Finland, citizens and businesses trust government agencies to provide services in a reliable, impartial and timely manner. The transparent and secure way in which personal data is managed is also crucial for building people's trust in the digital world.[23] This ever-increasing amount of data, generated and harnessed, is a priceless asset for many organizations. This will also lead to the productive workplace our modern

[20] Digital Finland Framework

[21] https://vm.fi/en/-/finland-retains-top-position-in-eu-digital-comparison

[22] https://toolbox.finland.fi/business-innovation/finland-as-a-global-leader-of-digitalisation/

[23] How Finland is embracing digital transformation

workers demand, the optimal processes the business needs to stay competitive, and the new ideas for disrupting industries.

According to the report of Microsoft Finland, there are five things supporting to succeed at digital transformation[24]:

1. Craft a clear strategic statement for your organization-wide digital approach, and clearly communicate at all levels.
2. Foster a culture that encourages innovative initiatives, especially in environments with ever-increasing speed and complexity.
3. Use all available data assets to efficiently deliver insights and value-add for the business.
4. Tailor a fit-for-purpose approach to engaging digital talent and external insights that discover, create and capture the value of digital opportunities.
5. Strive rigorously to define and deploy the KPIs that enable impact assessment for digital investments and efforts undertaken.

3.3 Digital practices in Finland

Digital services already are quite common in Finnish everyday life (in banking, health care, education). According to the COVID 19 situation many digital services are developed and have been implemented more widely, for example a digital signature, digital shopping, digital visits in health care, digital meetings and conferences. People started to use digital opportunities more actively also during their free time (digital conversation between family members and friends).

Larger use of digital opportunities as well new and variegated users will highlight many questions of digital etiquette and security. Companies and organisations offer training in digital work and security. Omnia is offering special support, guidance and training of virtual working both for students and staff. There is general guidance for students on the web-page of Omnia: https://www.omnia.fi/opiskelijansivut/kaytannon-tietoa/helpdesk/ohjeita-etaopiskeluun. There are also supporting platforms such as Suomidigi, to support in general questions[25]. YLE, the national media company owned by the Finnish state, offered training and testing of digital skills on their platform: https://yle.fi/aihe/digitreenit.

[24] How Finland is embracing digital transformation

[25] https://www.suomidigi.fi/artikkelit/kymmenen-suositusta-digiturvalliseen-etatyohon-ja-vapaa-aikaan

4. Digital education in Finland

4.1 General background and reforms

Finnish society promotes equality and opportunities to all citizens despite their native or socio-economic backgrounds. The educational focus is on achievements and skills of first- and second-generation immigrants, people with disabilities and other groups in a vulnerable position lag those of the rest of the population. Finnish education system starts digitalization from early childhood education. However, Finnish early childhood lags far behind other Nordic countries.

To increase employment level and opportunities the schools are in key roles. The changing demand of the working life demands upskilling and continuous learning. Finnish education system has gone through a reform which gives more opportunities to those who continue to higher level education. Vocational schools have a more agile education system and individual support on each and every student's educational path is in key role.

Finnish government has decided to raise the age of compulsory education to 18 years. The new system intends to implement near-term measures to respond to the shortage of skills and to train adults with a low level of basic skills e.g., computer and digital skills. The educational focus is also, on recognizing and acknowledging the skills gained in working life and/or prior studying in vocational school.[26]

4.2 Upper Secondary level - Vocational education

The upper secondary level education in Finland is focused on improving students' skills for the demanding working life. The vocational school education (180 competence points) consists of vocational units which are 145 competence points and the common units which are 35 competence points. The common units include communication and digital skills unit 2 competence points. The main objective of digital education in every field of education is to ensure students' digital skills needed in working life and further education.

The objectives are:

- Students know how to use the most common ICT devices and make choices related to them.

The minimum requirements:

[26] https://valtioneuvosto.fi/en/marin/government-programme

To choose appropriate devices according to the purpose of use with some guidance and to use the most common ICT devices at the level of a citizen's digital competence, with some guidance.

- use digital services and applications.

The minimum requirements:

- To obtain information on appropriate digital services and applications with some guidance.
- To use digital services and applications in their work tasks with some guidance.
- With some guidance, use and share digital content, observing copyrights.
- To comply with instructions related to data security and data protection and understand the
- principles of creating their online identity and protecting it.[27]

4.3 Influence of COVID 19 and remote working

The corona – crisis put some effective improvement on digitalization of schoolwork and education on every educational level. The remote studying and virtual teaching challenged the schools to provide training and support for the teachers and improve the equipment. The students were obliged to learn different platforms and virtual learning methods. The most challenging scenario was the lack of proper network connection and proper computer. Many students, especially immigrant backgrounded adults, didn't have computers at home or any skills to start remote studying. The lack of digital skills needed to keep up with the society's digitalization and to promote digital citizenship is a challenge that vocational schools and the education system need to resolve.

In Omnia remote teaching is encouraged, and the school has resources to train and support teachers. Omnia has developed different kinds of digital methods for many years. The new challenge is to provide computers to all the students coming to study under the new regulation of increasing the age of leaving school from 16 years to 18 years on upper secondary level. The students have no choice but to study either in preparatory education or at the upper secondary school until they turn 18 years old. Education in general should be free of charge.

Improving students' knowledge on information technology and digital skills is one of the challenges we face in Finland. The remote studying in 2020 and continuing in 2021 has increased the need of teaching the basic digital skills for students of every age.

[27] https://eperusteet.opintopolku.fi/#/en/esitys/6779583/reformi/tutkinnonosat/6783152#osaalue3548176

The survey was made to the students 2020 to get feedback and more information about their needs and knowledge during the virtual learning and studying.[28] Altogether 2289 students from Omnia replied to the questionnaire. There were two background questions about the **age** of the student (below or over 18 years) and **mother tongue**. There were 7 arguments and 3 open questions in the questionnaire.

Participants evaluated to what extent (in scale from 1 to 5) they have experienced the following arguments untrue or true:

1. I got enough information to move the blended/remote studies in mid-March 2020.
2. My studies have proceeded as planned during the remote studies and guidance.
3. I think that I have been contacted often enough during the remote teaching and guidance by college personnel (mainly teachers).
4. I have received enough support and guidance from teachers during the remote study period.
5. How many hours/day have you got real teaching or support online?
6. How many hours/day and /week have you done independent tasks on your own?
7. What tool/method have you used when participating in remote teaching?

Alternatives were Teams, Collaborate, Moodle, Phone, E-mail, Whatsapp, Hangouts, Facebook, Classroom, Skkype, Schoology.

In addition to these students gave open verbal feedback to several questions. This feedback was also classified into different categories.

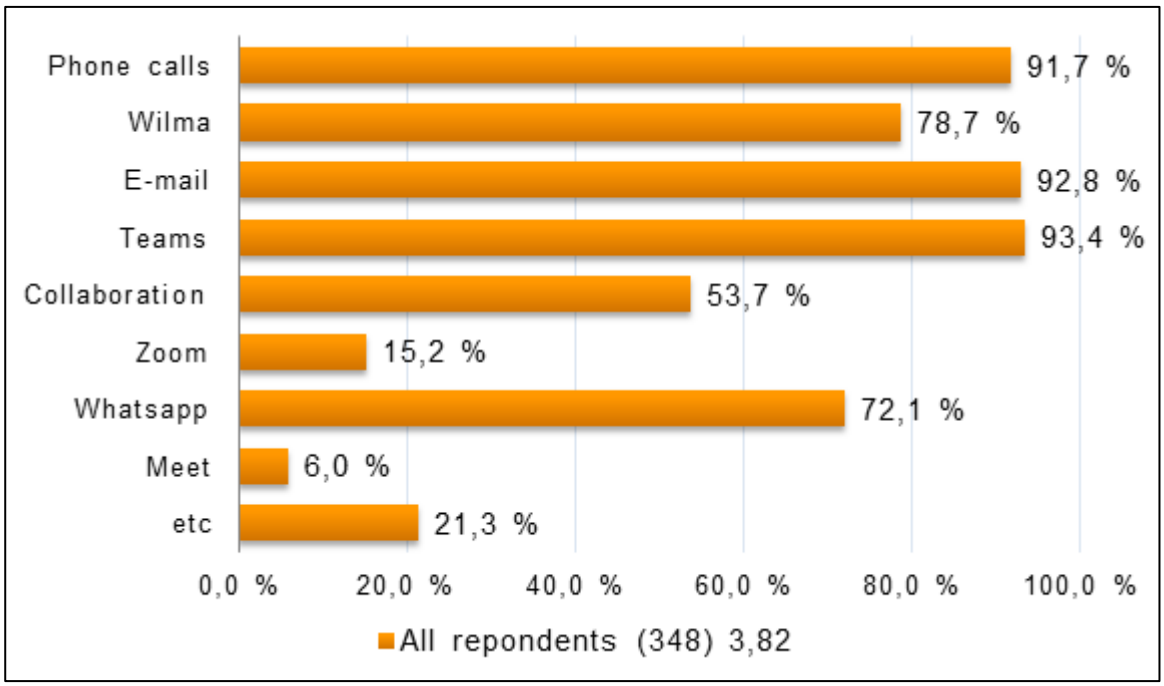
The first corresponding questionnaire was also done for Omnia staff in June 2020, after the abrupt transfer of all teaching and guiding online from March 16th until the end of May 2020. Altogether from 532 respondents from Omnia 348 teachers replied to the questionnaire. The aims of this survey were to find out the implementation of remote working and occupational safety risks in exceptional circumstances of COVID 19:

- smooth transition to remote working
- implementation of own work tasks during the remote working
- affection to the implementation and fluency of the remote working
- methods and applications used during the remote working
- duration of the lessons and guidance per day during the remote working.

[28] https://www.omnia.fi/uutiset/remote-teaching-changes-studies-due-covid-19-during-period-november-30-2020-january-3-2021

According to the recommendations and experiences in Omnia, e-learning was implemented mostly in Teams (93,4 %) and Moodle Collaboration classrooms (53,7 %). Teachers used for guiding e-mails, calls and Whatsapp (both personal and group) discussions. (Figure 4.)

Figure 4. Methods and applications used for virtual working, teaching and supervision staff



The fluency of remote working was increased if the respondent already had experience and skills in digital teaching methods and the use of applications, as well as some prepared online teaching materials. The tools of remote working (computer, telephone) and the quality of the internet connection had a weakening or smooth effect on the respondents, depending on how well they worked at home. According to the respondents' experience, the support and training of the distance learning team, the ICT staff, the immediate supervisor and colleagues increased the smoothness of remote working. Person's attitude felt to play a big role in the way they work remotely.

Looking at the issues affecting the implementation and fluency of remote working, the teachers pointed out the students' lack of ICT skills and equipment, study motivation and weak language skills.

4.4 Digital Omnia

Omnia is a multidisciplinary educational institute for lifelong learning with research activities that promote innovative pedagogical solutions for the future and the creation of modern learning environments. The focus areas of our research activities include:

- working with the national and international research networks in vocational education and training (VET), adult education and liberal adult education (LLL)
- involvement and networking in multidisciplinary research projects with those, who carry out the research
- being an active member of VET -research integration with the universities of applied sciences and science-networks
- sharing research results for the use of vocational education and lifelong learning.

Omnia offers innovative learning environments, new learning solutions and innovations. Entrepreneurship and employment are key themes aligning all development activities of Omnia and the ICT/Digital Learning Solutions Team. This team acts as a support team for the entire Omnia staff in making the digital leap and engaging them in the use of digital tools as part of their teaching. The team participates in projects, both national and international, which currently include for example process digitalization, teacher training, and virtual learning spaces (collaborative web environments, AR, VR and MR). The projects are the key in developing new ideas for educational development in everyday teaching and learning. All projects are joint efforts with the teaching faculty. The ICT Team contributes to this goal by developing platforms for digitalization of learning.

Pedagogy and digital teachers as well digital tutor-students of Omnia form Omnia support for all departments, teachers and learners. Omnia supports digital pedagogical themes by organizing teachers' training and uploading different materials on the pedagogical and digital learning landscape https://oppiva.omnia.fi/. There are many forms of support, donors and channels providing support for different situations: pedagogical, technical or administrative.

For example, the Learning and Skilled Staff team provides quick answers to acute questions by asking a question on a thematic channel. They also offer a wide range of short trainings on various themes. Pedagogy teachers and digital teachers help in the pedagogical development of courses and implementations and in the design of new ones, whether realized near or online.

Omnia Makerspace is a collaborative project that brings together the local start-up community and VET students. Omnia Makerspace and other collaborative models closely linked to it boost students' understanding of the working life, their entrepreneurial skills and comprehension as well as technological competences in authentic working life projects. The start-ups get help in innovation, problem-solving, testing, and they also get hand-picked on-the-job learners. The creative and global atmosphere of the building provides a novel approach and attitude instead of staying on the school campus or doing apprentice in a traditional, more established company. Online MOOC course on XR (virtual/augmented reality) is in the works jointly by Omnia, Metropolia UAS, and the Finnish companies in the XR sector. New study unit on

artificial intelligence has been developed and will run as a participatory and exploratory workshop in Makerspace in May. Startups have been interested in carrying it out together with Omnia.[29] [30]

4.5 Competence profiles update perspective and impacts for the future digital society

Digitalisation and technological development play a central role until 2035[31]. The digital skill creation is accelerated from basic education to company employees. The share of mathematics and science in all education levels, from elementary school to universities has increased. The digital professional and university education is boosted not only in technical sectors but also in application professions. Use of Mass Open Online Courses (MooC) is encouraged.

According to the Finnish National Forum for Skills Anticipation and future scenario citizens' digital skills were examined (DigComp 2.0). Metaskills will be increasingly important in the future: problem solving skills, self-regulation, the ability to learn, development and management of personal competence, and information evaluation skills. The importance of skills related to digitalisation, the ability to utilise digital solutions and platforms will increase.

Digitalisation will change the operating practices of companies and customer behaviour and will become an essential condition for companies' operation and competitiveness. On the list of the most important future skills were highlighted skills in customer-oriented development of services and knowledge of sustainable development.

5. Conclusion

The digital transformation of Finnish society is happening fast. Finland has been ranked as one of the leading countries in several digital transformation related assessments. The political programmes, budget and development supported the digital transformation. The aim is to increase the technological and digitalisation capacity of the public sector and to develop public-private partnerships until 2023.

Digital services already were quite common in Finnish everyday life and this gave a good base for quick reaction and transformation to remote working during 2020 (Strengths according to the SWOT analyse, Figure 5). Covid 19 situation rapidly increased use of different online services,

[29] https://oppiva.omnia.fi/makerspace/?cookie-state-change=1581945021394
[30] https://tekoalyrekka.fi/ai-truck/
[31] https://www.google.com/search?client=firefox-b-d&q=osaaminen+2035

both to education, work and free time activities. According to the COVID 19 situation many digital services are developed and have been implemented more widely. All education and training (basic level shorter, secondary longer and high education level mostly during one year) was transferred to online. The importance of skills related to digitalisation, the ability to utilise digital solutions and platforms increased. The strengths, weaknesses, opportunities and threats of digitalisation in Finland are analysed in Figure 5.

Figure 5. SWOT analysis of the digitalisation in Finland

S	W	O	T
Digital services already are quite common in Finnish everyday life (in banking, health care, education, shopping, health care, meetings etc.). Covid 19 situation rapidly increased use of different online services: work, education and free time activities. Quick transfer to the remote studying and virtual teaching based on the ability to utilise digital solutions and platforms, on increasing digital skills. Encourage and readiness to use different platforms and virtual learning methods. Omnia promotes innovative pedagogical solutions for the future and the creation of modern learning environments. Omnia is an active member of VET - research integration with the universities of applied sciences and science-networks The ICT/Digital Learning Solutions Team in Omnia supports Omnia in making the digital leap and engaging them in the use of digital tools as part of the teaching Omnia has resources to train and support teachers: Pedagogy and digital teachers as well digital tutor-students The pedagogical and digital learning landscape in Omnia https://oppiva.omnia.fi/ Omnia Makerspace is a collaborative project that brings together the local start-up community and VET students.	The tools of remote working (computer, telephone) and the quality of the internet connection had a weakening or smooth effect on the teachers, depending on how well they worked at home. The students' lack of ICT skills and equipment, weak language skills and study motivation The lack of proper network connection and computer, especially immigrant backgrounded adults, didn't have computer at home or any skills to start remote studying. The lack of digital skills needed to keep up with the society's digitalization and to promote digital citizenship is a challenge that VET and the education system need to resolve. Missing eye contact and non-verbal communication, closed microphones and cameras (during meetings, learning), passive participation. Different digital platforms, needs to register in different platforms Students needed much more personal support Importance of metaskills: problem solving skills, self-regulation, the ability to learn, development and management of personal competence, and information evaluation skills Personal attitude, encourage and motivation: some people needs more time for 'warming up' – during on-line event this will mean quiet time. People with low skill in using ICT and different digital platforms are scared to use and participate on on-line event (problems with connection, voice, finding materials etc.)	The political programmes, budget and development supported the digital transformation: Program for the Promotion of Digitalisation 2023, The Finnish Digital infrastructure strategy 2025. The fundamental research, development and innovation programme ICT 2023, Academy of Finland and Business Finland. Different supportive activities, for example 'digituki' digital support persons in organisations and Suomidigi; YLE offers training and testing of digital skills on their platform. Trust is a pivotal factor for successful digital government. The transparent and secure way in which personal data is managed Digitalisation as a key element of the future operation and competitiveness. Importance of metaskills in the future. Finnish education system offers training in digital skills on every level Reform in Finnish education: raising the age of compulsory education to 18 years, to provide computers to all the students coming to study under the new regulation between 16 to 18 years on upper secondary level. VET has a more agile education system and individual support, personal study pathway. The new system intends to implement near-term measures to respond to the shortage of skills and to train adults with a low level of basic skills e.g., computer and digital skills. Person's attitude felt to play a big role in the way they work remotely.	The lack of digital skills needed to keep up with the society's digitalization and to promote digital citizenship Larger use of digital opportunities as well new and variegated users will highlight many questions of digital etiquette and security. Cyberbullism and problems with data protection Personal attitude: low self-confidence in using ICT or learning new things of ICT, fear, prejudices. Change in social relations, remote working and using digital tools do not support creating 'old-fashion' relationships among people. People need also social contacts.

Digitalisation and technological development play a central role until 2035 as well the digital skill creation is accelerated from basic education to company employees. There were identified three-level skills needed: generic skills, common working life skills and skills specific to vocational fields. For best development in the future, the Finnish enterprises expect to invest in and

prioritization within AI, IoT, robotics, AR/VR, blockchain and 3D printing, in the public sector there is increasing interest in using different robotics. On the list of the most important future skills were highlighted skills in customer-oriented development of services and knowledge of sustainable development. Also, metaskills will be increasingly important in the future: problem solving skills, self-regulation, the ability to learn, development and management of personal competence, and information evaluation skills.

The COVID 19 implemented some effective improvement on digitalization of schoolwork and education on every educational level. The remote studying and virtual teaching challenged the schools to provide training and support for the teachers and improve the equipment. The students were obliged to learn different platforms and virtual learning methods. The most challenging scenario was the lack of proper network connection and proper computer. Many students, especially immigrant backgrounded adults, didn't have computers at home or any skills to start remote studying. The lack of digital skills needed to keep up with the society's digitalization and to promote digital citizenship is a challenge that vocational schools and the education system need to resolve.

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