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# TEACHERS' EXPERIENCES OF DISTANCE EDUCATION TRIGGERED BY COVID-19 IN FINLAND AND TURKEY - DIGITAL TRANSFORMATION IN PRACTICE

*Research article*

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## Abstract

Distance education was typically selected teaching method as a response to the COVID-19 pandemic across the world. This article introduces the survey results on Finnish and Turkish teachers' experiences of distance education triggered by the pandemic. The research focused on clarifying how the pandemic has affected teachers' digital skills, overall readiness for distance education as well as willingness to distance education in the future. A total of 137 teachers from various backgrounds participated in the online survey during 2021-2022 academic year. Comparative survey method was used in the study. Data were collected by using the online survey tool Webropol. Descriptive statistics were used for quantitative data and content analysis was used to analyze data and interpret results of open-ended questions which were collected via survey. The results pointed out that the pandemic promoted digital transformation in education as teachers' digital skills and readiness for distance education improved significantly during the first pandemic year both in Finland and in Turkey. The result is significant because digital transformation is seen as a driver and forerunner of sustainable development. This article provides valuable data of current practices, proposals to be considerate in arranging and developing distance education in future as well as ideas for further research in digital transformation in education.

*Keywords:* Digital Transformation, Digital Skills, Distance Education, Online Teaching

## 1. Introduction

The coronavirus pandemic has had serious impacts on countries in social, political, economic, educational, cultural, and healthcare areas all over the world since Spring 2020 (Abumalloh et al., 2021; Nambiar, 2020). One of the key areas strongly impacted by the pandemic has been education (Abumalloh et al., 2021; Akyıldız, 2020; Yamamoto & Altun, 2020). Across the world countries have developed various strategies to combat the pandemic, and the common global strategy has been to contain the spread of the virus. One of the common precautions taken in this context has been to close schools as it provides social distance among people, help to break the transmission disease chain, and thus reduce transmission rates (Al Lily et al., 2020; Germann et al., 2019). Thus, more than one billion students have been affected by the closure of schools and universities (UNESCO, 2020) during the first year of the

pandemic. It seems that the COVID-19 pandemic will continue to affect everyday life in the medium and long term (Toquero, 2020).

The distance education method has emerged as an easy and applicable solution to minimize a negative effect for education due to closure of schools. Educational technologies, which are developing at an unprecedented pace in the digitalizing world, have emerged as the most appropriate teaching tool during the pandemic. Thus, distance education has become an inevitable solution that are utilised by various countries to ensure the continuity of teaching processes during the pandemic. (Abumalloh et al., 2021; Al Lily et al., 2020; Gandolfi, Ferdig & Kratcoski, 2021; Pekkola et al., 2021). Distance education offers opportunities as well as risks and disadvantages. One of the biggest risks is that it will further deepen inequalities in the current education system. In particular, children from socioeconomically disadvantaged families do not have the same opportunities and resources as their peers (Emin, 2020). Anderson (2020) pointed out that moving the teaching to the Internet has clearly demonstrated the deep inequalities in the education system, e.g., because of there is no device or reliable internet connection everyone, or students are upon parents' power etc. At this point, according to Giannini and Albrectsen (2020), the schools closure had negative impacts on the education and future of women and girls, especially in poor and backward regions (such as Mali, Niger and South Sudan). Another disadvantage of distance education is that children are deprived of peer education that is very important for socialization for children. As children are not able to leave their homes due to the pandemic they are unable to meet their socialization needs (Emin, 2020).

Digital change in education is also inevitable. On the other hand, digital transformation is seen as a driver and forerunner of sustainable development (Gomez-Trujillo & Gonzalez-Perez, 2021). Today, students are increasingly using technology in their daily lives as well as in learning environments, and most of them have been born into the digital world (Balyer & Öz, 2018). To support digital change, European and international policies and standards have been developed for education, such as the International Society for Technology Education (ISTE-a, 2016; ISTE-b, 2017) or the OECD Center for Educational Research and Innovation (OECD-a, 2018; OECD-b, 2018; OECD-c, 2020). Despite various initiatives, there is still a lack of standards and guidelines on how students should be prepared for digitization through public administration education (Schenk & Dolata, 2020). Hai, Van and Thi Tuyet (2021) pointed out that successful digital transformation requires more research as well as investments for all sectors of society. Digital transformation is a strategic issue that requires new kind of innovative leadership thinking (Balyer & Öz, 2018; Barrutia and Echebarria, 2021; Hai, Van & Thi Tuyet, 2021). In addition, governments need to commit to providing the conditions and foundations for developing and growing in the digital age (Hai, Van & Thi Tuyet, 2021).

As in many countries, face-to-face educational activities in schools, universities, and many other educational institutions have been temporarily suspended due to the COVID-19 pandemic, also both in Turkey and Finland. In practice, the pandemic forced all educational institutions to work remotely and to implement distance education immediately without preparation (Al Lily et al., 2020; Bozkurt & Sharma, 2020). Thus, the pandemic should be seen as an opportunity for educators to gather experiences and to contemplate how to further improve the distance education both from pedagogical and administrational view of points. Given the major role that distance education plays in today's educational activities, the results of this study provide valuable data of current practices and proposals of improvement issues as well as ideas for further research to be carried out relation to the design and use of distance education settings at all grade levels and educational institutions. The main purpose of this article is to examine distance education experiences of Finnish and Turkish teachers, their digitals skills for arrange distance education, and their overall readiness for distance education

before lock-down caused by pandemic and then one year after. The aim of the research was to clarify if the pandemic promoted digital transformation in education. The results provide a better understanding of distance education challenges and potential with discussions of proposed improvement actions in future. The article proposes interpretations for main differences between the countries with recommendations for further research.

This article is structured as follows. In the section 2, the literature study and related work in relation to teachers' experiences of distance education has been introduced. In the third section research design with data collection, used tools and research methods with identified research questions are presented. After that, in section 4, the main findings of the survey are introduced and analysed. The final section discusses the findings and presents the conclusions of the survey.

### 1.1. Diversity of distance education

There is a wide array of concepts in the existing literature on online teaching and learning. These concepts encompass different meanings but they are, sometimes, used interchangeably (e.g., distance education, emergency online education, remote teaching) (Carrillo & Flores, 2020; Hodges et. al. 2020; Toquero, 2020). Schlosser and Simonson (2009) defined distance education as an institution based and formal education where interactive telecommunications systems are used to connect between resources and instructors as well as the separate learning group. Saykılı (2018, 5) defined distance education in its broadest sense as follows:

"Distance education is a form of education which brings together the physically-distant learner(s) and the facilitator(s) of the learning activity around planned and structured learning experiences via various two or multiway mediated media channels that allow interactions between/among learners, facilitators as well as between learners and educational resources."

The concept of distance education, like all innovations and inventions, was devised to respond to a need (Süğümlü, 2021). Distance education provides flexibility to learning environments and is therefore regarded as a promising innovation and development (Allen et al., 2010). It brings freedom and flexibility to everyone own study. Indeed, distance education creates an alternative education method that is free from the boundaries of time and space (Bılgıc & Tuzun, 2020). At the same time, it requires initiative, self-activity and the ability to manage one's own time from students as well as certain specific skills relation to pedagogical arrangements and digital tools from teachers. However, the distance education was seen as a potential alternative to implementing training during the pandemic (Dutta & Smita, 2020).

#### 1.1.1. Reflections of distance education

As a result of the closure of educational institutions caused by the pandemic, teachers and students had to adapt to distance education quickly and suddenly (Abumalloh, 2021; Al Lily, 2020; Carrillo & Flores, 2020). The distance education system has its own advantages and disadvantages (Süğümlü, 2021). The most important problems of distance education have been reported to be the lack of motivation among students due to the absence of a face-to-face interaction between students and teachers (Arora & Srinivasan, 2020; Sintema, 2020) as well as the lack of high-quality interaction and communication (Akyıldız, 2020; Arora & Srinivasan, 2020; Chen et al. 2001; Falowo, 2007; Jin, 2005). The lack of face-to-face interaction causes such problems as difficulties in giving feedback to students and problems in conducting teaching activities according to students' interests and abilities, and this way teachers' inability to use various pedagogical methods (Sintema, 2020).

Besides, technical problems such as internet connection problems and the lack of necessary infrastructure are among the factors that hamper distance education (Arora and Srinivasan,

2020; Korkmaz & Toraman, 2020; Owusu- Fordjour, Koomson & Hanson, 2020; Özgül, Ceran and Yıldız, 2020). In this regard, making computers or tablets and internet access available for every student is very important to ensure equal opportunity in distance education (Bayburtlu, 2020). Nagar (2020) defined the key factors that have an impact on the effectiveness of online learning as follows: availability of digital devices, internet connection, and the infrastructure supporting online learning. In addition, Lomakina (2020) stated problems from a lack of technical support may adversely affect distance education activities.

1.1.2. Digital transformation in education

For two reasons, technological innovation and expansion are critical. First, emerging technology has an influence on the information technology infrastructure of the teaching and learning environment. Second, owing to new hardware and software technologies, new teaching methodologies may be implemented (Pahl, 2003). Technology contributes to the education reform goal of promoting student learning through collaborative engagement in authentic, difficult, multidisciplinary tasks by creating complex, realistic environments for student inquiry, providing information and tools to support investigation, and linking classrooms for collaborative investigations (Means & Olson, 1997). Changes in labor policy, social and scientific debates, and how individuals and organizations learn have all been influenced by digitalization and digital transformation (Kamsker et al., 2020). The process of "digital transformation" is critical for adopting digital solutions into our daily lives. However, the digital transformation not only enhances traditional solutions but also opens the door to creative concepts. Furthermore, there was a desire to include digital technologies into the classroom (Bogdandy, Tamas, & Toth, 2020).

Even if the phenomena of digital transformation is not new, it has become more significant in recent years due to the rapid advancement of technology and the widespread use of telecommunications networks. The requirements and perspectives of the new generations, who were born and reared in a fully digital world, are unlike anything that has come before (Rodrguez-Abitia & Bribiesca-Correa, 2021). All facets of human existence, including education, undergo quick and major changes as a result of the rapid inflow of a vast amount of data and the widespread global introduction of digital technologies (Ipatov et al., 2020). Digital Transformation is ongoing, important process that affects our everyday lives providing new enhances solutions or innovative new approaches for different sectors of our society like businesses, trade, industry, tax, or health care (Balyer & Öz, 2018; Bogdandy, Tamas and Toth, 2020; Hai, Van &Thi Tuyet, 2021). Parviainen et. al. (2017) defined digital transformation “as changes in ways of working, roles, and business offering caused by adoption of digital technologies in an organization or in the operation environment of the organization”. Also, in education sector digital solutions have to integrate and develop into learning, teaching, administration processes, systems or environments (Balyer & Öz, 2018; Bogdandy, Tamas & Toth, 2020). Modern scholars are increasingly interested in the issue of digitization in education (Ipatov et al., 2020). Recently, the digital transformation in education has been discussed in several publications, e.g., in (Balyer & Öz, 2018; Bogdandy, Tamas & Toth, 2020; Hai, Van & Thi Tuyet, 2021; Marks et al., 2021; Schenk & Dolata, 2020; Schmidt and Tang, 2020). As public debate grows, so does the awareness and importance of digital skills for both students and teachers. Digital transformation in education is a long process that became an important concern in the spring of 2020 owing to COVID-19 (Bogdandy, Tamas, & Toth, 2020). Digital transformation has quickly become a major concern for many firms working in various industries, with constant acceleration being the fundamental feature of this transition process (Seres, Pavlicevic & Tumbas, 2018).

"Digital transformationis a complex and continuous transition where numerous education stakeholders learners, teachers, the administrative staff (including the IT department), as well as the broader community-must work together closely" (Grosseck, Maliţa & Bunoiu, 2020: 566). The COVID pandemic has promoted digital transformation in education (Hai, Van & Thi Tuyet, 2021). However, many digital transformation challenges and obstacles in education have still been identified like lack of holistic vision, digital transformation competency, and staff digital skills (Marks et al., 2021) as well as lack of innovative thinking leaders with a digital transformation mindset (Hai, Van & Thi Tuyet, 2021). Digital change is not a momentary and transient phenomenon, but change is the continuous adoption and integration of new practices and enhanced digital solutions into operations. Therefore, in this study, the phenomenon was also examined in terms of things perceived negatively or needed more supported.

## 2. Review of Literature

The number of international studies on distance education applications used during the pandemic is increasing day by day (Hebebci, Bertiz & Alan, 2020). According to Koçoğlu and Tekdal (2020) activities of distance education have started to attract more attention from scientific circles in many countries due to the coronavirus pandemic. In addition, the distance education has been predicted to be a major field of research for global education studies in the post-COVID-19 period (Kaarakainen & Saikkonen, 2020).

The literature review yielded several studies examining the impact of the coronavirus pandemic on education. Some of these studies are related to distance education experiences of prospective teachers (Mohalik & Sahoo, 2020; Yolcu, 2020), teachers' views on and perceptions of distance education (Bakioğlu & Çevik, 2020; Bayburtlu, 2020; Gandolfi, Ferdig & Kratcoski, 2021; Giovannella, Passarelli & Persico, 2020; Süğümlü, 2021), students' experiences in distance education (Kedraka & Kaltsidisi, 2020; Xie & Yang, 2020;), students' views on and perceptions of distance education (Abumalloh et al., 2021; Adnan & Anwar, 2020; Akyıldız, 2020; Cao et al., 2020; Dutta & Smita, 2020; Engzell, Freyd & Verhagena, 2020), parents' views on and experiences in distance education (Demır & Demır, 2021; Gandolfi, Ferdig & Kratcoski, 2021; Garbe et al., 2020; Koskela et al., 2020), country-based distance education reviews (Alea et al., 2020; Ferraro et al., 2020; Nambiar, 2020Pekkola et al., 2021), culture-based approach to distance education (Al Lily et al., 2020), and the effects of COVID-19 on education (Flores & Swennen, 2020; Konig, Jäger-Biela & Glutsch, 2020).

Several related studies were examined for finding most important topics to be contributed in our research as introduced before. For example, Arora and Srinivasan (2020) introduced impacts of the COVID-19 pandemic for teaching-learning process gathered from 341 teachers in India by focusing on the adoption rate, benefits, and challenges of distance education. The results concluded that despite having positive opinions about distance education, some teachers pointed to the problems such as network-connection issues, a lack of training, and a lack of awareness. Alea, Fabrea, Roldan and Farooqi (2020) examined teachers' awareness about the COVID-19 pandemic and their views about their schools' readiness, as well as the challenges of implementing distance learning in the Philippines. The results pointed out that teachers' awareness about and readiness for distance learning differed depending on their gender, length of teaching experiences, and geographic location.

Furthermore, literature studies were conducted relating to results of Finnish and Turkish teachers' experiences in and views about distance teaching (Ahtiainen et al., 2020; Bakioğlu & Çevik, 2020; Bayburtlu, 2020; Kim & Asbury, 2020; Niemi & Kousa, 2020; Taipale, 2021) for building knowledge base and identifying focus on our research.

Ahtiainen et al., (2020) presented the results of an extensive Finnish nationwide survey of the views and experiences of students, families, teachers, principals, student care staff, and other school staff during the first two months of school closure. A total of 5,361 teachers from 853 schools and 218 municipalities responded to the section of teachers' survey. The majority of responding teachers felt that their own devices (84%), network connections (74%) and software and learning materials (72%) worked well. In contrast, students' devices (51%) and network connections (32%) were not as often perceived to work well. Teachers (89%) felt that the workload of exceptional circumstances was higher or much higher than normal. The majority of teachers (94%) estimate that their own digital skills have developed, and more than two-thirds of teachers (69%) believe that the teaching experience during the extraordinary period will affect how they will teach once the situation returns to normal.

Taipale (2021) studied Finnish teachers' experiences in the distance education by interviewing eight classroom teachers. The results showed that students and teachers improved their technology skills thanks to using digital tools more frequently than in face-to-face education. Also, the opportunity for some students to work individually was found as beneficial. On the other hand, teachers emphasized problems such as a lack of face-to-face interaction, a lack of communication, and a lack of teacher and peer support for students. Niemi and Kousa (2020) investigated the perceptions of students and teachers in one Finnish high school during two first month's emergency distance education. The study determined that students complained of heavy workloads and fatigue and that some students lost motivation. The main challenges for teachers were reported as non-authentic interaction and a lack of spontaneity provided by in-person teaching. They also expressed their concerns about students' progress and about the lack of high-quality interaction through technological platforms. However, teachers stated that they quickly learned to use technology platforms and digital tools. Bakioğlu and Çevik (2020) investigated the experiences of Turkish science teachers in distance education during the COVID-19 pandemic. The analysis of the data obtained from 75 teachers revealed problems such as poor internet connection, a lack of quality interaction with students, and low classroom participation. Besides, teachers reported that the distance education process positively affected their educational technology usage skills and professional development. Bayburtlu (2020) examined the views of 30 Turkish teachers to reveal the state of Turkish education during the COVID-19 pandemic. Teachers stated that during the distance education process, some students were unable to attend online classes due to the absence of computers or tablets or due to internet connection problems and some students developed screen addiction. They also noted that student participation was not at the desired level and that parents were not involved in their child's education. In addition, the participating teachers said that they would like to receive training on digital content design and development.

The COVID-19 pandemic should be seen as an opportunity for educators to contemplate how to further improve the distance education system. The literature study showed that improving existing distance education applications provides an important opportunity for more effective execution of future distance education applications (Akyıldız, 2020; Saavedra, 2020; Ali, 2020). Since health crises like the COVID-19 pandemic may occur in the future again (Niemi & Kousa, 2020), it's important for all countries' education systems to identify challenges and obstacles that need to be improved. For the paradigms and benefits put forward in relation to distance education to bring success, first of all, it is necessary to reveal teachers' views about and experiences in this process (Mulenga & Marbán, 2020). Teachers are the backbone of education systems and the key for reaching learning goals, regardless of context and situation (International Task Force on Teachers for Education 2030, 2020).

The literature study illustrated that there are lot of similarities in findings of various research relating to distance education experiences affected by the pandemic. Often, however, there

were some limitations in the research process (e.g., small sample size, perspective, or timing of the study at the beginning of the lock-down) that make it difficult to generalize the results unambiguously. Many studies were focused on narrow viewpoint, such as to students' or parents' views or culture-based approach to distance education. In addition, many of recent studies introduced teachers' first experiences very soon (1-2 months, even 6 weeks) after the lockdown at the beginning of the COVID-19 pandemic Spring 2020. Al Lily et al., (2020) emphasised that crisis distance education is unique and fundamentally different from typical distance education. Thus, we decided to perform a survey in 2021-2022 academic year, one year after the lock-down. The findings of literature study were utilised in the content of our online survey. Thus, the survey used in the research was formed by combining the items in some related questionnaires. The survey was conducted with the same content in both Finland and Turkey so that the results could be compared, and this way also partly to be validated. The aim was to find the main similarities and differences in the results between the countries. In addition, the aim was to interpret the reasons for the differences in order to find development proposals for the future.

To promote the digital transformation of teaching and learning, it is critical to comprehend both instructors' and students' technological skills and knowledge, as well as their demands, and to strive for mutual understanding of both views (Bond et al., 2018). Determining teachers' perceptions about the issue and taking the necessary measures seem to be essential to increase the quality of both face-to-face and distance education (Orhan & Beyhan, 2020). To this end, the present study focused on teachers' views and experiences. Within this scope, the study included teachers from all regions and educational stages from Turkey and Finland regardless of their teaching speciality, age, gender, educational background, etc.

## 3. Method

The main purpose of this research was to examine teachers' experiences of distance education in Finland and Turkey. The following research questions were addressed:

(Q1) Has COVID-19 affected Finnish and Turkish teachers' readiness for distance education?

(Q2) Has COVID-19 affected Finnish and Turkish teachers' digital skills?

(Q3) Has COVID-19 affected Finnish and Turkish teachers' willingness to distance education in the future as well?

(Q4) What are main differences in the experience, digital skills and readiness for distance education affected by COVID-19 while comparing of Finnish and Turkish teachers?

In order to get answers to the set research questions an online survey was implemented. The comparative survey research refers to any survey research that is developed to compare certain groups, thus it was selected to be our one research method. The quantitative approach was utilised for analysing results, and also a qualitative approach with a content analysis method was utilised for interpreting open-ended questions of the survey (Jason & Glenwick, 2016).

The Finnish and Turkish surveys were administered in the 2020-2021 academic year through an online survey tool, Webropol (https://webropol.com/). An actual survey form consisted of 20 multiple-choice or open-ended questions dividing to four main sections. The first section of the survey contained background questions that aimed at determining certain demographic characteristics (age, gender, educational background, length of teaching experience, experience in distance education, digital skills). The second section of the survey

focused on working environments and overall readiness and skills for distance education before the COVID-19 pandemic. The third section aimed at revealing participants' own experiences in distance education (preparation for lessons, use of new tools, own digital skills, loneliness, teamwork, etc.). The last section – now and future - aimed at finding out about participants' thoughts and attitude about the present and future of distance education as well as about the advantages or disadvantages of their distance education experiences. This section of the survey was also focused to find out if there was any visible digital transformation seen in teachers' attitudes, for example, in their willingness for distance education in future, or their self-assessed level of own digital skills affected by the lock-down period caused by COVID-19 pandemic.

## 3. Results

A total of 137 teachers working in various education levels and fields as well as different regions of Finland and Turkey were participated in online survey. All responses were analysed by means of frequencies and percentages whereas responses to Likert-type questions were described using descriptive statistics such as means, standard deviations, frequencies, and percentages.

### 3.1. Background issues

Participants' demographic characteristics such as gender, age, educational background, and length of teaching experience are introduced in Table 1. Totally 66,4% of the participants were female and 33,6% were male.

Table 1. *Gender and age of respondents*

| | Gender of respondents | | | | | Age of respondents | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Woman | | Man | | Total | 25-34 | | 35-44 | | 45-54 | | 55-64 | |
| | N | f | N | f | N | N | f | N | f | N | f | N | f |
| Finland | 56 | 69,1 | 25 | 30,9 | 81 | 7 | 8,6 | 18 | 22,2 | 31 | 38,3 | 25 | 30,9 |
| Turkey | 35 | 62,5 | 21 | 37,5 | 56 | 31 | 55,4 | 20 | 35,7 | 5 | 8,9 | - | - |
| Total | 91 | 66,4 | 46 | 33,6 | 137 | 38 | 27,7 | 38 | 27,7 | 36 | 26,3 | 25 | 18,2 |

Accordingly, the age ranges of Turkish and Finnish teachers vary significantly: Finnish teachers were older than their Turkish colleagues. In addition, a majority of Turkish teachers' educational background had an undergraduate degree 66,1% whereas a great majority of Finnish teachers had a graduate degree 64,2% (Table 2).

Table 2. *Background educational level of respondents*

| Education levels | Vocational qualification or equivalent | | Matriculation and vocational qualification | | College-level or post-secondary non-university diploma | | Master degree | | Doctoral degree | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | f | N | f | N | f | N | f | N | f |
| Finland | 3 | 3,7 | 2 | 2,5 | 18 | 22,2 | 52 | 64,2 | 6 | 7,4 |
| Turkey | - | - | - | - | 37 | 66,1 | 15 | 26,8 | 4 | 7,1 |

As shown in Table 3 Finnish teachers were more experienced in the teaching profession that Turkish teachers.

Table 3. *Professional experience of respondents*

| Professional experience (year) | 0-5 | | 6-10 | | 11-15 | | 16-20 | | 21-25 | | 26-30 | | over 30 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | f | N | f | N | f | N | f | N | f | N | f | N | f |
| Finland | 19 | 23,5 | 11 | 13,6 | 12 | 14,8 | 12 | 14,8 | 14 | 17,3 | 9 | 11,1 | 4 | 4,9 |
| Turkey | 18 | 32,2 | 20 | 35,7 | 5 | 8,9 | 7 | 12,5 | 4 | 7,1 | 2 | 3,6 | - | - |

Furthermore, as a background question, teachers' experiences of distance education before the COVID-19 pandemic was clarified. The results showed that Finnish teachers had significantly more experience of distance education than Turkish teachers already before the pandemic. For example, even 73,2% of Turkish teachers indicated that they hadn't had any experiences of distance education before the pandemic. Instead under half, 40,7% of Finnish teachers informed the same.

### 3.2. Working environments and readiness for distance education

The survey clarified how teachers evaluated readiness level of their own school for distance education just before lock-down during the COVID-pandemic March 2020. The results showed that Finnish teachers estimate that their school's readiness was mainly mediocre 38,3% or good 44,4%. In addition, even 16,1% of respondents felt that their school's readiness was excellent. Turkish teachers estimate that the readiness of their own school is clearly weaker than their colleagues in Finland. Even 42,8% of Turkish respondents indicated that their own school has not readiness at all. In addition, teachers were asked to evaluate their own general technical or digital skills before the pandemic. The analysis noted that Finnish teachers rate their own digital skills considerably better than Turkish colleagues did. According to their own estimates, all Finnish teachers had at least limited skills. In addition, as many as 42,0% rate their skills as "good" and 8,6% as even "excellent". In contrast, as many as 17,9% of Turkish teachers estimated that they had "no skills at all" and no one rated their skills as "excellent".

### 3.3. Experiences of distance education carried out during the pandemic

Responders of the survey gave their opinions how distance education caused by the COVID-19 pandemic was influenced their work during the first pandemic year. Table 4 shows the distribution of all answers in Finland and Turkey.

Table 4. *Teachers' experiences of COVID-19 influences for their work*

| In my opinion, COVID-19 influenced my work as a teacher by adding… | | Strongly agree | | Somewhat agree | | Not agree or disagree | | Somewhat disagree | | Strongly disagree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Fin | Tur | Fin | Tur | Fin | Tur | Fin | Tur | Fin | Tur |
| …preparation work of lessons | N | 35 | 10 | 20 | 22 | 7 | 15 | 8 | 7 | 11 | 2 |
| | % | 43,2 | 17,8 | 24,7 | 39,3 | 8,6 | 26,8 | 9,9 | 12,5 | 13,6 | 3,6 |
| …use of new tools | N | 37 | 13 | 24 | 23 | 4 | 10 | 7 | 4 | 9 | 6 |
| | % | 45,7 | 23,2 | 29,6 | 41,1 | 4,9 | 17,9 | 8,7 | 7,1 | 11,1 | 10,7 |
| …my abilities and skills of distance education | N | 31 | 15 | 29 | 21 | 6 | 10 | 8 | 7 | 7 | 3 |
| | % | 38,3 | 26,8 | 35,8 | 37,5 | 7,4 | 17,9 | 9,9 | 12,5 | 8.6 | 5,3 |
| …my digital skills overall | N | 22 | 15 | 36 | 22 | 11 | 9 | 6 | 8 | 6 | 2 |
| | % | 27,2 | 26,8 | 44,4 | 39,3 | 13,6 | 16,1 | 7,4 | 14,3 | 7,4 | 3,5 |
| …loneliness | N | 30 | 6 | 17 | 16 | 11 | 18 | 11 | 12 | 12 | 4 |
| | % | 37,0 | 10,7 | 21,0 | 28,6 | 13,6 | 32,2 | 13,6 | 21,4 | 14,8 | 7,1 |
| …teamwork | N | 4 | 7 | 17 | 15 | 23 | 13 | 26 | 13 | 11 | 8 |
| | % | 4,9 | 12,5 | 21,0 | 26,8 | 28,4 | 23,2 | 32,1 | 23,2 | 13,6 | 14,3 |

*Fin: Finland, Tur: Turkey

The results showed that Finnish teachers felt that the pandemic had a very big impact on their work by increasing preparation work of lessons (43,2%), use of new tools (45,7%), and their abilities and skills for distance education (38,3%). These items were also emphasized in the responses of Turkish teachers, but not as strongly as in the responses of Finnish colleagues. Turkish teachers felt an increase in these tasks was mainly 'Somewhat agreed'. In addition, even 71,6% of Finnish and 66,1% of Turkish teachers evaluated that their digital skills increased either somewhat or strongly, and more than half of Finnish teachers 58% felt that loneliness had increased.

### 3.4. Now and in the future

The study pointed out that over half of teachers in Finland and in Turkey assessed their skills being either 'excellent' or 'good' after the first pandemic year. Correspondingly, less than 5% of teachers felt that their digital skills were at "poor or beginner" level (both in Finland and Turkey) and no one assessed their digital skills being "no skills" at all.

The survey examined also the amount of distance education experience accumulated by teachers during the first COVID-19 pandemic year. The results pointed out that over 90% of teachers informed having at least limited number of experiences of distance education. However, there could be seen differences between answers of Finnish and Turkey teachers. The majority of Finnish teachers 69,2% felt that they had "a lot of experience" of distance education. While only 33,9% of Turkish teachers felt that they had "a lot of experience" and even 60,7% of Turkish teachers informed that they had "very limited experiences" of distance education after one year from the beginning of the COVID-19 pandemic.

The survey clarified teachers' assumptions of the future: will or not distance education be still included among their school practices after the pandemic, and how tightly. The results showed that face-to-face training would still act a big role after the pandemic even if alternative pedagogical methods with distance education will be utilised, that was stated by 51,9% of Finnish and 48,2% of Turkish teachers. However, almost a third of Finnish teachers (27,2%) and a fifth of Turkish teachers (19,7%) assumed that the situation would return back to the situation before the pandemic where face-to-face teaching would be the only teaching method in the future.

### 3.5. Digital transformation in education based on the survey

In this section, the main findings are introduced in relation to set research questions. The change in teachers' readiness for distance education (Q1) evaluated via amount of distance education experience accumulated during the COVID-19 pandemic. The study focused in particular on how experience was gained among teachers who had "no" or "very limited" experience with distance education before the pandemic, shown in Figure 1. The study pointed out that the change was obvious: one year after the start of the pandemic, almost all teachers had accumulated experience of distance learning.

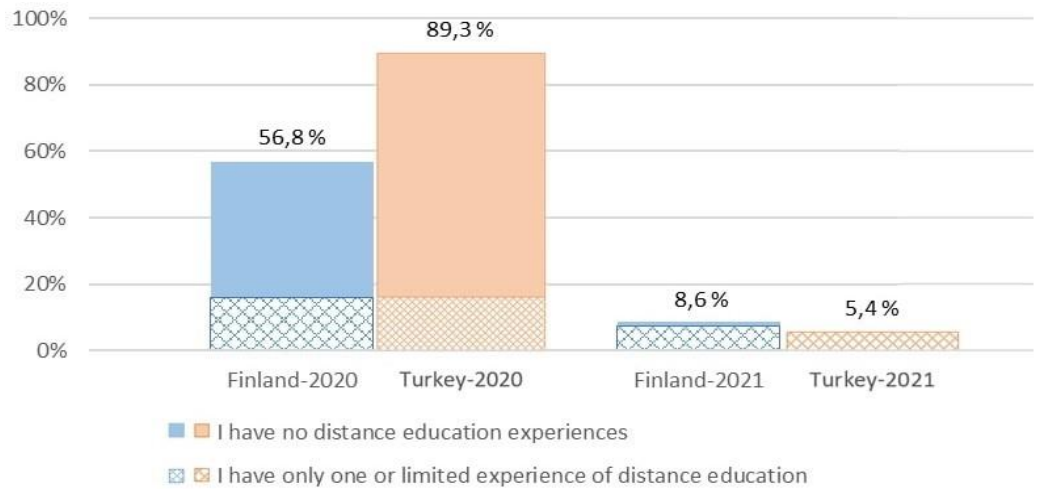


*Figure 1.* The change in distance education experiences

In 2021, about 1,2% of Finnish teachers indicated that they had still "no experience" at all, and 7,4% had "very little experience" of distance education. Correspondingly, 5,4% of Turkish teachers reported that they had "very little experience", and no one reported that they had "no experience" at all with distance education. The change is drastic in all, but the change was greater among Turkish teachers.

In relation to Q2, all of the teachers self-assessed their own digital skills significantly better in 2021 than in the early days of the pandemic in 2020. The study showed that no teacher estimated that they did not have digital skills at all after the first pandemic year, nor in Finland or in Turkey (Figure 2).

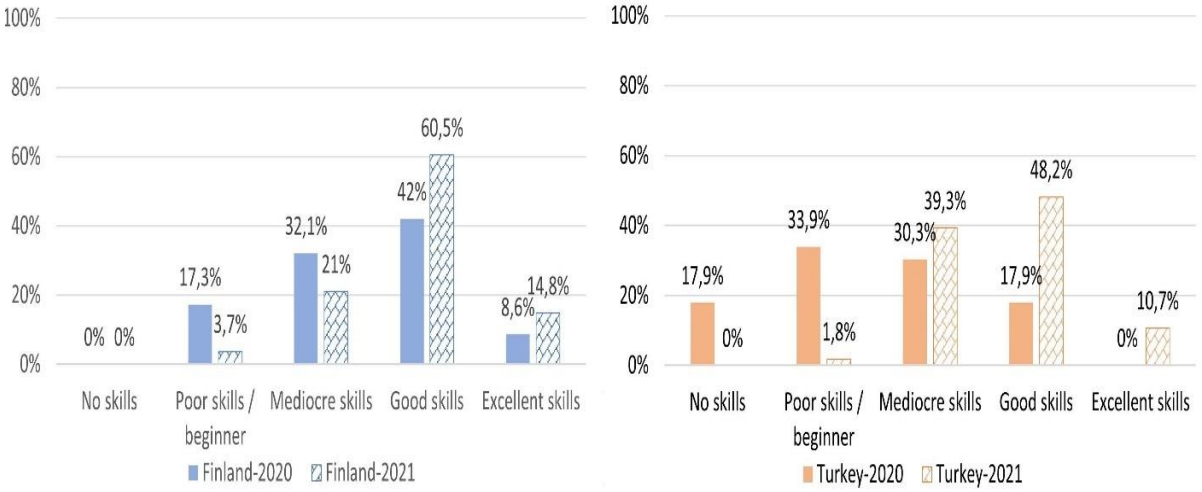


*Figure 1.* The change in teachers' digital skills in Finland and in Turkey

While analysing the change more details, it can be recognised that in Turkey the change has been bigger than in Finland. The biggest change in the improvement of digital skills of Turkish teachers had occurred precisely in those who assessed their skills in 2020 as "no skills" or "poor skills".

For finding answers to Q3, the responders were asked to give their opinions would they prefer distance education even if it would be possible to do the education with face-to-face as before the pandemic. Only 6,2% of Finnish and 25,0% of Turkish teachers would preferred distance education to face-to-face education in future. It seemed that Finnish teachers were more opposed to distance education than their Turkish counterparts: as many as 72,8% of

Finnish respondents thought that distance education was not a better option in the future. Correspondingly, more than half of Turkish teachers (55,4% in total) thought that they either "preferred" or "maybe preferred" distance education in the future as well. The same trend was seen in teachers' opinions on how distance learning will be reflected in education in the future. The majority of Finnish teachers (79.1% in total) assumed that in the future teaching will return to be almost entirely face-to-face teaching, at least it will play the largest part (like over 75% of all lessons) of teaching.

Searching main differences (Q4) in the change of teachers' readiness, digital skills, and willingness for distance education based on teachers' experiences during the first pandemic year, the biggest difference between Finland and Turkey was in attitudes for utilising distance education in future as introduced before in details. Thus, the deeper study focused on the Finnish teachers' group (as a part of the sample) that stated out distance education was not a better option in the future (72,8%, N=59). Their open-ended answers to question "Describe max 3 negative items or experiences in your work affected based on distance education triggered by the COVID-19 pandemic" was analysed with the content analysis method. Results are shown in Figure 3.

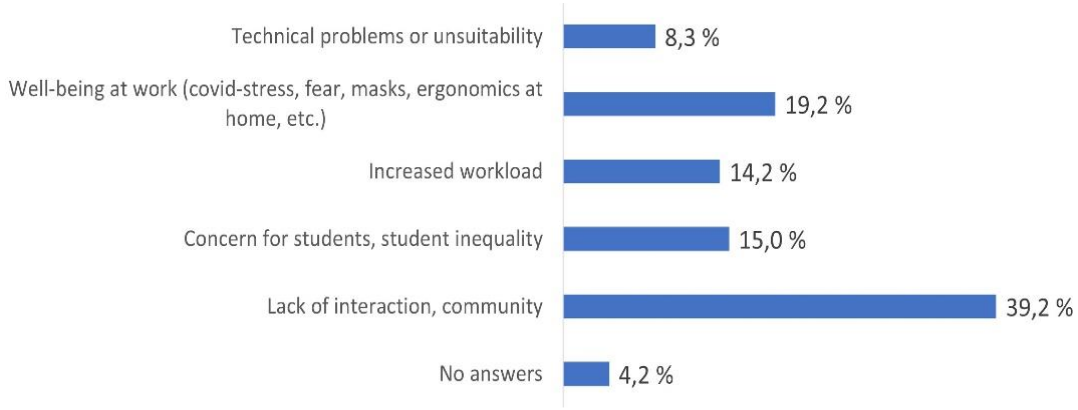


*Figure 1*. The most negative items described by Finnish teachers (N=59)

Many of the described negative effects (Figure 3) were derived more from the pandemic reasons. For example, "Wellbeing at work" focused on COVID based issues (masks, fair) and problems caused by suddenly moving to distance education (ergonomics at home). The increased workflow was often caused the needs to re-plan lessons for being more suitable in distance education. Also, the additional tasks and questions were raised from needs to advise students in their new situation at home. However, the big part of negative items (39,2%) identified as "lack of interaction or community" that could be supported by developing more suitable communicative tools and systems as well as pedagogical methods in distance education and remote working.

## 4. Discussion and Conclusion

In March 2020, the World Health Organization announced COVID-19 had spread as a global pandemic, so most governments decided to close schools and switch to distance education to combat the spread of the virus. The governments of Finland and Turkey decided also lock-down restrictions and so suddenly distance education was the only possible form for education. This research was focused on clarifying effects of the first pandemic year to digital transformation in education.

The results showed that Finnish teachers had more experiences of distance education at the beginning of the lock-down than their Turkish colleagues had. Also, schools' readiness for distance education, such as internet connections, suitable equipment (tablet, laptop or

smartphones) available for students and teachers, or trained support persons for advising in use, was in Finland at better level than in Turkey. In addition, Finnish teachers self-assessed their own general technical or digital skills before the pandemic much better level than their colleagues in Turkey. An explanatory factor for these differences might be the backgrounds of the respondents but also differences in governments' digital strategy in education sector. The Finnish teachers who responded to the survey were more educated and, on the other hand, their teaching environment in 2020 was mostly in vocational schools or higher education like applied sciences or universities. Instead, Turkish teachers worked mainly in preschool, primary, or secondary schools. On the other hand, in Finland the Ministry of Education and Culture has been making the promotion of digital change in all levels and fields of education a strategic issue for several years (Ministry of Education and Culture Strategy, 2019) and these activities can surely be seen in the survey results.

The results pointed out that the digital transformation in education was promoted during the first pandemic year by measured teachers' readiness for distance education, amount of gathered experiences and increased teachers' digital skills. Furthermore, the research pointed out that Finnish teachers were more opposed to distance education in the future than their Turkish colleagues, even though their starting situation at the beginning of the pandemic (e.g., schools' readiness, teachers' digital skills and their more extensive previous experience of distance education) was significantly better. One big difference between Finnish and Turkish government approach during the lockdown was how schools and teachers were supported in the transition to distance education at the beginning of the pandemic Spring 2020. On March 23, 2020, the Turkish Ministry of Education launched a free distance education system with a television and Internet-based curriculum. Weekly curricula were reformed at all school levels (primary, secondary, secondary, upper secondary) and replacement support training was provided via the Internet and a television screen using the Education Information Network. The Finnish Ministry of Education and Culture did not offer a similar centralized support or curriculum. Hence each school in Finland had to decide on how to respond to the crisis without common and general guidelines. Typically, the individual teacher tried to find and develop pragmatic solutions to meet the needs of their students and subject. This might also be one reason why Finnish teacher felt that distance education had greatly increased loneliness (Table 4). If teachers felt that they were in a situation of change with new distance education arrangements alone, without systematic support, this may well be reflected in a negative attitude towards distance education in the future.

International studies related to digital transformation in education have indicated that cross-country comparison studies are limited. Moreover, the number of studies which depend on country based has increased and the concept of digital transformation has gained momentum in the last decade (Rodríguez-Abitia & Bribiesca-Correa, 2021). There is a trend towards the use of major digital transformation technologies such as artificial intelligence, cloud technologies, and the internet of things (Limani, Hajrizi & Retkoceri, 2018). The key point to increase the quality of education is digital transformation (Grosseck, Maliţa & Bunoiu, 2020). Important achievements have been reached with digitalization in the field of education (Qarkaxhja, et al., 2021). In addition, the results of studies indicate that digital transformation is mandatory for some countries due to Covid 19 (Bogdandy,Tamas, & Toth, 2020), Digitization processes of countries can be improved; digital literacy and competencies of educators and students can be improved significantly (Bećirović & Dervić, 2022).

The digital transformation in education is still in progress and requires supportive actions. It's not only a school-inside issue, instead it also requires strategic approach, planning and support from governments level or top management of organisations (Balyer & Öz, 2018;

Barrutia & Echebarria, 2021; Hai, Van & Thi Tuyet, 2021; Pekkola et al., 2021). With new kind of innovative leadership thinking and knowledge, development of tools and systems to support the most harmful items of distance education identified in current practices is necessary. The further research needs to be focused on both top-bottom approaches (Barrutia & Echebarria, 2021; Hai, Van & Thi Tuyet, 2021;) as well as certain tool-specific features, such as: how to support more efficiently interactions in different situations like in real-time online or asynchronous, between individuals and groups, or how to develop and support the use of learning analytics for reducing teachers' workload (Abumalloh et al., 2021). At governments and politics level must be ensured students' equal opportunities for distance education with availability of equipment and network connections (Gandolfi, Ferdig & Kratcoski, 2021).

In summary, in both Finland and Turkey, COVID-19 has strongly promoted teachers' the amount of experience and thus awareness and competence in distance education. Both teachers' digital skills and readiness for distance education have improved significantly. Based on the results can be stated that digital transformation – as it was defined in this article – has happened in organisations, various schools, both Finland and Turkey. In addition to, digital transformation can be seen happened in readiness, such as digital skills and adoption on digital technologies in the operation environments of schools. However, digital transformation - when focusing on the permanent change of ways of working among the teachers - was not so clear or simplify. Almost 73 % of Finnish respondents informed that they will not prefer distance education in the future while 45% of Turkish teachers informed the same. The results showed that the permanent change in ways of working had been bigger among Turkish teachers than Finnish teachers. However, it is important to note that digital transformation never happens in an instant but requires the adoption and maturation of many things both at the individual level and in the organization.

**Limitations and evaluation of the research**

In quantitative research, research validity can be evaluated, for example whether the information collected in the questionnaire was received on the issues for which answers were requested and whether the answers received were correct (Panter & Sterba, 2011; Vilkka, 2021) By analysing the results, it can be concluded that the answers seemed correct and were well covered for the set research questions. The number of respondents of the survey was good, which improve the validity of the research and indicated the relevance of the study for respondents. A sufficient number of answers also improves the generalizability of the results (Heikkilä, 2014).

However, there are some limitations in the research. The backgrounds of participants in Finland and in Turkey were diverged a lot and thus larger sample of the respondents would be better and increase reliability of the research. Partially, because of variety of participants' demographic characteristics, the research focused on bigger wholeness for providing the overview of the situation. Further research would focus on only 1-2 attributes, to find more explanatory factors and reasons, not only consequences. In addition, digital transformation never happens in an instant but requires the adoption and maturation of many things both at the individual level and in the organization. Thus, assessing digital transformation in education based on one-year duration is difficult, and longitudinal research is needed.

Despite these limitations, this study provided valuable data and proposals to be considerate in arranging and developing distance education in future as well as ideas for further research in digital transformation in education.

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