The Impact of Digital Transformation in Teachers' Professional Development During The COVID-19 Pandemic

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Abstract. This article presents a study conducted to reveal the positive and negative aspects of professional development programs conducted to teachers in distance education during the novice COVID-19 pandemic and investigates whether the programs contributed to the digital transformation competencies the teachers acquired through these programs. The case study was carried out with a total of 30 teachers, who took part in the study voluntarily. Qualitative and quantitative data collection methods were used in order to ensure the validity, reliability, and consistency of the research. Once the teacher-oriented professional development program was completed, the teachers were subjected to an achievement test and a self-assessment questionnaire. A focus group interview was conducted to collect various views of 18 teachers regarding the program. This study also reveals that teacher-oriented professional development programs can be applied efficiently through online education and have a crucial role in strengthening and enhancing the technical competencies of the teachers involved in distance education.

Keywords: COVID-19; pandemic; teacher development, online teaching, distance education, digital transformation

1.   Introduction

COVID-19 virus that initially emerged at the end of 2019 and later was declared a global pandemic by the World Health Organization has affected the entire world in a considerably short time. This pandemic has emerged with different scenarios in many ways. Education is one of these scenarios. The COVID-19 pandemic has changed our perspective on education and the way we interpret it. A pandemic that is effective on a global scale can be considered as a disaster by nature, and while this disaster can be the end of some things, it can also be interpreted as a sign of new beginnings. Within the scope of these thoughts, it is possible to say the impacts that Covid-19 has had on the world has led to the new normal and this will lead to a new world order [1].

With the onset of the pandemic, schools were closed and face-to-face education was suspended due to the global pandemic. 1.5 billion students, which corresponds to nearly half of the student population from all education levels were unable to proceed with

their education. In Northern Cyprus, approximately 50 thousand students at the primary and secondary education levels were affected by this problem [2].

"The COVID-19 pandemic has led to new inequalities that can push us further back. In order to make up for the interruption of education and recover the lost time caused by the pandemic, rapid emergency distance education applications have been implemented by many educational institutions all over the world. Education stakeholders have faced the unexpected challenges of providing emergency distance education. Significant efforts have been made to leverage technology to support distance learning, distance education, and online learning during the COVID-19 pandemic" [3].

Being able to have access to uninterrupted to the Internet in countries and regions is certainly beneficial to have online education, enabling schools to deliver their courses online and where teachers can manage control and share their teaching resources. The transition to home learning and working from home have contributed to a significant increase of time children and their parents shared. Consequently, parents have actively participated in supporting their children's online learning experiences. Moreover, distant education has also increased the participation of societies in creating a possible suitable learning environment [4].

Due to the COVID-19 pandemic, education almost in all schools have been discontinued, and face-to-face education at all levels has been suspended. This has made countries and schools deploy distance education modalities through the internet, online platforms, mobile apps, and television to ensure that students are not completely disconnected from their education processes.

In this process, teachers' academic support became necessary and they were involved in the distance education process. Countries that were able to integrate distance education into their education systems before the emergence of the COVID-19 pandemic did not experience significant challenges in this emergency distance education process. However, countries that have never used distance education experienced many challenges in this process. The fact that teachers were not ready in terms of technological competencies for this emergency distance education was one of these challenges [5].

Compared to the period in which schools were operational, education was implemented in the classes, and communication technologies were easily accessible, teachers have had to cope with a much more intense workload, demand, and more effort was expected from them while shifting from conventional education to urgent delivery of distance education. The closure of schools and the interruption of face-to-face education not only affected the students, but also their parents. Parents' concerns regarding the learning and development of their children have made them demand more attention and time for their children from the teachers [6].

1.1.   Distance Education All Over the World during the COVID-19 Pandemic

Distance education has become one of the most challenging issues teachers faced during the transitional period from the traditional to online education. In this process, educational authorities need to enforce precautions, such as guiding teachers, providing them with the support they need, providing model practices, and creating environments that will enable collaboration between teachers to be carried out remotely. Teachers

have a crucial role in delivering quality education at all levels during and after the COVID-19 pandemic, so it is very important to make sure that teachers are provided with the required support to enable them to overcome the challenges likely to be encountered in this process [7].

The closure of schools and interruption of face-to-face education caused an emergency transformation from traditional to distance learning at all levels of education across the globe. During this process, both teachers and students, and even parents, have been provided with the support required to carry out distance learning. In this section, this study provides a deeper insight and data on how some countries switched from traditional to online learning or distance learning.

Existing infrastructure was used to support distance learning in Southern Cyprus during the Covid 19 process. By providing internet access for students at all levels of education, priority has been attached to receiving online education at home through computers or tablets. A remote synchronized training program was implemented using Microsoft Teams; more than 110,000 teachers and students have been provided with access to this software. Starting with high school teachers, intensive online teacher training courses have been provided by the Cyprus Pedagogical Institute. At the school level, teacher networks have been established to provide peer assistance in the use of distance learning tools. Students have been informed about how to use distance education tools with the help of their teachers [8].

Content repository and supporting educational material for all students have been uploaded to the web page of the Ministry of Education and the web page of each school. Public and private television channels have broadcasted courses and other educational programs especially for primary school students [9].

In North Cyprus, schools were closed as of March 2019, and accordingly, education began to be carried out asynchronously in the Moodle system of the Ministry of National Education. In addition, courses have been scheduled to be broadcasted on national television channels. In order to boost the teachers' competencies in using technology for remote learning, in-service training was held through online teaching. As of September 2019, schools started their new semester online supported with live classes [2].

1.2.   Recent Studies

Many teachers who were not trained adequately on how to cope with such situations in their pre-service and in-service training, and who had never had such an experience before, were caught off guard for this process. In many countries, teachers were expected to take the initiative and execute their teaching by themselves without the help of others.

Teachers with limited technological competencies in providing remote learning faced challenges in carrying out their tasks effectively. In addition to the different competency levels of technology use between teachers, the resources of schools, students' access the digital tools, and their competency using these tools, the socio-economic profile of schools and students have a significant impact on how teachers conduct distance education [10].

In this context, many online training programs have been tailored and provided for teachers across the globe on emergency distance education. The study conducted by

Fauzi and Khusuma, presents the views of the school teachers in Indonesia regarding the current situation in delivering online education. Based on the data they acquired from their study conducted with 45 Indonesian school teachers, they stated that the teachers had information about online learning but they experienced problems associated with internet access and planning [11].

Johannes König, Daniela J. Jäger-Biela & Nina Glutsch, in their study that they conducted in Germany when the schools were closed, investigated the process regarding the adaptation of teachers to online teaching, and they not only focused on the extent of social contact that the teachers were able to establish with their students, but also the infrastructure and technological competencies required for online education. As a result of the research, it was revealed that training programs were needed to enhance technological and digital competencies of teachers for online education, and inferences were obtained in terms of the scope of this education [12].

In their study, Carrillo and Flores investigated the requirements of teacher training programs-online during the emergency transition from traditional to remote education. By analysing the practices on online teaching and learning, they underlined the significant role of online pedagogy in enhancing the competencies of the teachers involved in distance education [13].

The study conducted by Hebebci, Bertiz, and Alan presented data based on the analysis of the views collected from teachers and students regarding the distance learning during the COVID-19 process. The study concluded that distance education modalities are effective provided that teachers are competent, content repositories and educational materials are adequate, and uninterrupted internet access is available for online learning. The study emphasized that restricted internet services, limited interaction, lack of materials, and infrastructural problems are factors that affect the learning delivery modality negatively. Additionally, the study drew attention to the necessity of restructuring in-service training [14].

In their study, Donitsa and Ramot investigated the role of collaboration between educational institution and telecom services in ensuring remote learning in a short time during the COVID-19 process. According to the data acquired through the study, they emphasized that in collaboration with schools and respective institutions, universities had successfully transition from traditional to emergency distance education in a relatively short time during the pandemic [15].

1.3.   Purpose of the Study

This study has been conducted with the purpose of revealing the digital transformation in teachers by evaluating the effectiveness of in-service training tailored to enable the rapid transition of the teachers to emergency online education in order to prevent the loss of education during the COVID-19 pandemic.

1.4.   Research Questions

In order to achieve the above-mentioned goals, the following questions were asked:

a. What are the situations that work well in the use of distance in-service training application?

b. What are the problems encountered in the use of the distance in-service training application?

c. Has online teacher training during the Covid-19 pandemic affected the digital transformation in education?

1.5.   Limitations

This study is limited to the use of a mixed research method. The quantitative part of the study is limited to the sample that consisted of 30 teachers who participated in the online professional development training programs voluntarily. For qualitative data, the population was limited to literature regarding distance education modalities during the COVID-19 process and the World Bank resources collected from March 2020 to June 2020, and among these resources, the sample was limited to five countries. The online professional development training program, which was carried out due to the urgent need for distance education, was designed considering that the participants had different technological competencies.

2.   Materials and Methods

2.1.   Case of the Study

This study has adopted a mixed research method based on acquiring, analysing, evaluating and integrating the data obtained through the qualitative and quantitative phases. The case study was adopted to identify the effect of the online teacher training program and ensure the consistency of the data acquired through the mixed research method.

2.2.   Participants and Procedure

The Online New Generation Teacher Training Program tailored for professional development as well as to improve the teachers' competencies required for delivering distance learning was announced through social media channels when schools were closed during the COVID-19 pandemic. A total of 30 teachers from primary and secondary education consented to participate in the event voluntarily.

Table 1. Demographic data of the teachers

		Frequency(f)	Percentage(%)
Gender	Male	6	20
	Female	24	80
Age	20-29	2	7.7
	30-39	10	33.3
	40-49	16	53.3
	50-59	2	6.6
Professional Seniority	1-10	6	23.1
	11-20	11	42.3
	21-30	6	20
Subject	German	1	3.8
	Geography	3	10
	English	3	10
	French	2	6.66
	Mathematics	6	20
	Music	2	6.66
	History	2	6.66
	Turkish	5	16.6
	Biology	2	7.7
	Physics	1	3.8
	Primary teacher	3	10

2.3.   Implementation Process

The instructional design model of the New Generation Teacher Training model is based on the ADDIE model, which stands for Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model is an ideal model that can facilitate the e-learning development process in the field of e-learning. At each stage, the e-learning developer can see how far he/she has progressed. Because the ADDIE model is a linear system, it is easy to go back and see what has gone wrong. It is also versatile as you can use it for a variety of e-Learning applications [16].

The participants of the study participated in the application as a single group consisting of 30 teachers. At the end of the study, an achievement test and a self-assessment questionnaire were applied to the participants and a focus group interview was conducted. Figure 1 shows the ADDIE model design process for "Next Generation Teacher Training". The research was carried out in 5 stage within the framework of the determined method.

In order to acquire data on the competencies required for switching to emergency online learning due to the pandemic, a thorough overview of the relevant literature was conducted as the first phase of the study. In the second phase, considering the data acquired through the qualitative method during the initial phase, a questionnaire form was prepared to collect the teachers' views and learn what they knew about the distance education modalities. Then, based on the data acquired through the literature review and survey, a new generation teacher training program was developed to address the requirements. The third phase was the implementation phase of the training program based on the ADDIE model. In the fourth phase, the teachers that participated in the training program voluntarily were subjected to an achievement test and a self-assessment survey. In the last phase of the training program, a focus group interview was held with 18 of the teachers that participated in the program in order to collect their views regarding the teacher training program.

Analysis. With the purpose of tailoring the necessary online teacher training program to enable the teachers to enhance their competencies in delivering distance learning to their students through the internet, online platforms, mobile apps, and television during the emergency distance learning imposed by COVID-19 pandemic, the relevant literature has been reviewed. The data acquired through the literature review were analysed and evaluated to determine the steps of the quantitative phase by taking into consideration certain specifications of the target audience such as technological literacy, age, gender, professional experience and educational level. The roles of education material delivery mode and learning delivery modality in achieving efficiency in distance learning have also been investigated. A special focus has been attached to identifying the physical and institutional limitations. The technical requirements have been identified. Additionally, investigations have been carried out and solutions have been generated to ensure the consistency and compatibility of the learning objectives to be determined with the e-learning media.

Design. Based on the analysis and results, the teacher training program was tailored and scheduled so as to ensure the rapid transformation from traditional education to the emergency distance education. The outcomes and Web 2.0 tools to be used were determined. Training modules based on the content and objectives of the program were created. Google Meet was used as the online learning medium. Google Classroom was used for sharing educational material. The process of evaluating the online teacher training program that would be held was also determined.

Develop. By taking into consideration the requirements of the emergency distance education imposed by the COVID-19 pandemic, the New Generation Teacher training program has been tailored and announced to the teachers via social media. Education materials have been developed in line with the topics to be covered by the training program. The e-mail addresses of the teachers who would participate in the training program voluntarily have been taken and the sample group has been formed. Additionally, instant communication with the group was ensured via WhatsApp. The teachers have been provided with information about the use of the online learning media required for the online New Generation Teacher training program. The training program was scheduled to be held three times a week from 25 March to 22 April.

Implementation. With the participation of 30 teachers, the New Generation Teacher Training Program was initiated as scheduled on 25 March via the Google Meet App. Invitations and course materials relevant to the topic to be covered were mailed to the teachers before the commencement of the program. Google Classroom was used to streamline the process of sharing materials, projects, and exams. During the app process, the teachers were not only provided information regarding the use of Google Drive, Google Documents, and Google Forms, but also the use of Nearpod for interactive lessons. The teachers were also trained on preparing interactive video lessons by using Edpuzzle, and using Jamboard as a collaborative digital whiteboard. In addition, the features of screen recording tools were addressed. The participant teachers were provided adequate information regarding the use of Filmora and YouTube as video editing tools. The Canva design platform was used to create visual contents. In order to evaluate the outcomes of each module, a mini quiz was held or applicable projects were delivered after each lesson. The online lesson recordings were mailed to the teachers and they were provided with the opportunity to watch them again.

Evaluation. During the four-week-long training program, the participant teachers were provided with 24-hour training. Once the New Generation Teacher Training Program was completed, an achievement assessment consisting of 35 questions and a self-assessment questionnaire were applied. Additionally, a focus group interview was held with 18 participant teachers to allow them to express their views regarding the training program.

2.4.   Data Collection Tools

The qualitative phase of the mixed-research method was used to collect data by scanning the literature concerning distance learning during the COVID-19 process. Based on the data acquired through the literature review, and the content of the teacher training program, the measurement tool for the quantitative phase was determined. The data of the research were collected through questionnaire, achievement test and focus group interviews. In addition, the opinions of field experts were consulted to ensure the scope and validity of the developed items and their suitability for the research. Consequently, in line with the views of the field experts, some items were revised and others were deleted and the final version of the questionnaire was completed.
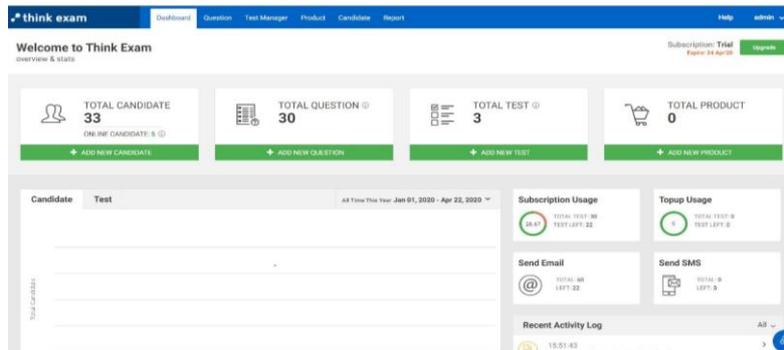
Fig. 1. Evaluation tool

Table 2. Demographic data of the teachers

Data Collection Tools	Female		Male		Total	
	f	%	f	%	f	%
Questionnaire	24	80	6	20	30	100
Achievement Test	24	80	6	20	30	100
Interview Questions	17	94.4	1	5.6	18	100

Questionnaire. An achievement test consisting of 30 items and a self-assessment questionnaire were applied to the teachers who participated in the teacher training program voluntarily. The self-assessment questionnaire used in the research was applied at the end of the training so that the teachers could make their own assessments (N= 35). A five-point Likert scale with the options (1) Strongly disagree, (2) Disagree, (3) Neither agree nor disagree, (4) Agree and (5) Strongly agree was used to enable the participant teachers to express the extent of their agreement or disagreement with the statements in the questionnaire. The achievement test was applied to the participant teachers at the end of the training program as well.

Focus-Group Interview. In addition to the survey questions, a focus-group interview consisting of five open-ended questions was held with 18 participant teachers to explore their views, provide suggestions regarding the New Generation Teacher Training Program and allow them to explain its effect on their accomplishments. The data acquired through the interviews have been provided by using codes instead of names to ensure confidentiality. Teachers' answers for each question were coded according to the frequency values within the determined themes and presented in tables. In addition, sample teacher statements have also been included in order to express the views of the teachers more clearly.

2.5.   Data Analysis

SPSS 20 package program was used for statistical analysis of the data acquired through the quantitative phase of the mixed-method. Descriptive analysis (mean, frequencies) was used to calculate and evaluate the data acquired from the teachers' self-assessment questionnaire applied at the end of the training program. Item difficulty analysis was conducted to determine the item difficulty level for the achievement test applied upon the completion of the training program. Furthermore, quantitative data regarding the focus-group interview were analysed, the teachers' answers were coded, themed and tabulated.

Validity and Reliability. Through analysis, the validity and reliability of the data collection tools have been determined. In addition, in order to determine the validity of the scope of the questionnaire, items were revised in line with the views and suggestions of the field experts and the validity of the questionnaire was tested through an internal consistency test. Data from the focus group interview recorded using content were also analysed, the themes were revealed and coded by working with another field expert, and direct quotations from the teachers' answers have been presented in tables to show that the study presents data on what it claims to measure. Cronbach's alpha was used to assess the self-assessment questionnaire score reliability and internal consistency. A Cronbach's alpha value greater than 0.70 indicates that the questionnaire is reliable. The self-assessment questionnaire Cronbach's alpha value was calculated as 0.993, which is a significantly satisfactory coefficient. The KR-20 test was used to calculate the reliability of the achievement test used in the study.The KR-20 coefficient of the achievement test was calculated as 0.72. A KR-20 score above 0.70 is considered a satisfactory level of consistency and reliability [17].

Table 3. Difficulty levels of the items in the achievement test (p)

Difficulty indices			
Item numbers	Difficult (0.00-0.39) (2,29)	Moderate (0.40-0.69) (3,7)	Easy (0.70 – 1.00) (1,4,5,6,8,9,10,11,12,13,14,15,16,17,18, 19,20,21,22,23,24,25,26,27,28,29,30)

3.   Results

The analysis of the study focused on revealing the positive and negative aspects of the online teacher training program and determining whether it contributed to the professional development of the teachers.

3.1.   Questionnaire Results

"New Generation Teacher Training Program", teacher achievement evaluation. In order to prepare the questionnaire for the achievement test to be applied at the end of the online teacher training program within the scope of the study, the objectives and targeted outcomes of the New Generation Teacher Training Program have been determined. During this process, two field experts working in the in-service training unit were consulted for their views and suggestions to ensure the consistency of the questionnaire items in terms of the targeted outcomes. Once the outcomes were determined, a question pool was developed by the researchers so that each outcome would be addressed by at least one question. The achievement test consisting of a total of 30 multiple-choice questions was first presented for expert opinion and necessary corrections or changes were made. Then, at the end of the online teacher training program, the participant teachers were subjected to the achievement test. Item difficulty and distinctiveness indices of each question have been determined and presented in Table 3 and Table 4.

Table 4. Distinctiveness indexes of the items in the achievement test (r)

Distinctiveness indices			
	Difficult (> 0.40)	Quite distinctive (0.30 – 0.39)	Low distinctive (0.19 – 0.29)
Item Numbers	(3,4,5,6,7,11,12,13,30)	(1,2,4,8,9,10,15,16,17,18,19, 20,23,27,28,29)	(21,22,24,25,26)

As can be seen in Table 4, 9 items have strong distinctiveness, 16 items are quite distinctive and 5 items have a low distinctive index. As a result of the distinctiveness analysis, the mean of difficulty of the items was calculated as $p=0.75$ and the mean of the distinctiveness of items was calculated as $r=0.29$. The reliability coefficient (KR-20) of the 30 items in the achievement test was calculated as 0.72.

3.2.   New Generation Teacher Training, Self-assessment Test

Based on the analysis of data acquired from the self-assessment test, it can be concluded that the online teacher training resulted in positive outcomes (total mean $x=4.07$). Considering the self-assessment results, it can be seen that the mean of all items is high. Item 4 and item 5 demonstrate highly significant means ($x=4.55$ and $x=4.51$). These values clearly indicate that almost all teachers who participated in the study gained competencies in using their e-mail accounts and Google Drive. Considering the teachers' answers to items 34 and 35, it is obvious that the teachers consider the online teacher training to be effective and the presentations are comprehensible. However, answers to items 22 and 24 show the lowest rates ($x=3.58$ and $x=3.62$).

Table 5. Self-Assessment Questionnaire

Items	Mean	Std. Deviation
1. I can easily involve in Google Meet communication medium.	4.24	1.37
2. I can easily use the communication medium.	4.17	1.39
3. I can actively participate in the course in the communication medium.	4.24	1.37
4. I can actively use my Gmail account.	**4.55**	1.24
5. I can upload files to my Google Drive account.	**4.51**	1.24
6. I can arrange my Google Drive files online.	4.37	1.23
7. I can share my Google Drive files.	4.37	1.23
8. I can share my Google Drive files through Google Classroom.	4.06	1.51
9. I can prepare quizzes by using the Google Forms App.	4.00	1.25
10. I can use different types of questions.	3.93	1.22
11. I can share the exams prepared by using Google Forms in different media.	3.96	1.37
12. I can find videos suitable to the course content through the Edpuzzle app.	4.00	1.33
13. I can add questions to the videos suitable to the course	3.96	1.32
14. I can share the materials prepared through the Edpuzzle app.	4.10	1.34
15. I can prepare e-presentations by using Google slide apps.	4.34	1.23
16. I can add images in the slide.	4.37	1.23
17. I can add a video in the slide.	4.37	1.23
18. I can give links in the slide.	4.06	1.36
19. I can add add-ons to a Google Slide.	4.06	1.38
20. I can use add-ons in a Google Slide.	4.10	1.37
21. I can use the NearPod app.	3.68	1.25
22. I can integrate the Nearpod app into Google Slides.	3.58	1.23
23. I can use Google Jamboard app screen	3.65	1.34
24. I can upload image or pdf file in the Google Jamboard.	3.51	1.35
25. I can edit the uploaded file.	3.75	1.18
26. I can share the edited Jamboard file.	3.62	1.37
27. I can login to YouTube with my Google account.	4.17	1.28
28. I can upload a video to YouTube.	4.10	1.20
29. I can use Edit option from Video Editor tab (Cut. split).	3.96	1.29
30. I can share YouTube videos.	4.31	1.22
31. I know the usage features of screen recording tools.	3.93	1.33
32. I can use the Loom screen recording tool.	3.65	1.39
33. I can record lessons by using the Loom recording tool.	3.75	1.29
34. Online lessons throughout the teacher training program were effective.	4.41	1.29
35. The presentations used in the training were comprehensible.	4.48	1.24
Total Average	4.07	1.30

When the means of the items are examined, it can be said that the online training, which has been tailored to enhance the competencies of the participant teachers on delivering distance learning through remote learning modalities, is effective. Although the means of items regarding the use of NearPod and Google Jamboard demonstrate lower values when compared to the others, the overall results clearly indicate that the content of the online teacher education is highly comprehensible.

3.3.   New Generation Teacher Training, Focus-group Interview

The first question of the focus-group interview was intended to collect information regarding the advantages of the online teacher training program that was designed as an in-service training. Based on the teachers' answers to this question, it can be said that training was beneficial in terms of providing the teachers with the opportunity to

improve their technical competencies required for delivering distance learning through learning modalities of the new normal.

Another question of the focus-group interview was designed with the purpose of collecting information about the challenges encountered by teachers during the online in-service training program. Based on the teachers' answers, it can be said that most of them not only experienced internet connection problems, but also challenges in following-up the course. They interpreted these problems as the disadvantages of the in-service teacher training as it requires both uninterrupted internet access and hands-on apps.

Another question of the interview was designed to measure the satisfaction of the participant teachers with the content of the in-service training. Teachers' answers to this question make it clear that the teacher training program-online provided the participant teachers with the opportunity to enhance their technical competencies required for delivering online learning to their students much more effectively during the emergency distance learning process imposed by the COVID-19 pandemic.

Another question was intended to measure whether the teacher in-service training, which was designed to improve the teachers' competencies in using the distance learning modality by using technological or digital environments, contributed to any change in terms of using technology. The teachers' answers to this question make it clear that the online teacher training program provided a platform for them to not only learn about apps that they had never previously encountered but also to use these apps in delivering online distance education to their students through synchronous or asynchronous lessons. They also stated that the online-teacher training program was beneficial as it gave them the opportunity to use different programs actively for different purposes.

The teachers' perceptions regarding the online teacher training program have been revealed through another question. The participant teachers' answers to this question exhibit their satisfaction with the teacher online training in terms of equipping them with teaching technologies to address the requirements of delivering emergency distance learning during the pandemic. They indicated that the knowledge they acquired from the "New Generation Teacher" online training enabled them to use these technologies immediately in delivering their online lessons by turning the existing crisis process into an opportunity.

Table 6. "New Generation Teacher Training", teacher opinions

Main Theme	Codes	f	Selected Teachers' Opinions
Advantages of Conducting In-Service Training Online	Building and increasing technological competency	8	T1: Before this training, I could only search by using Google. Now I can design and deliver online courses.
	Opportunity for self-development (professional development)	6	T7: I have attended many in-service training programs for many years, but I consider this training as one of the rare ones that contributed to my professional development.
	Awareness of Educational Technologies	13	T8: For the first time in my life, I was able to teach online with my students using what I learned in this course. T13: I had the chance to implement programs that I have never applied or used before.

Disadvantages of Delivering In-Service Training Online and Challenges that experienced (Limitations)	Internet Access Problems	6	T8: Internet problems such as poor internet connectivity and interrupted internet access caused me to break away from continuous education. T14: The biggest problem encountered during this training is the poor internet connection.
	Follow-up the course	4	T2: From time to time, I had difficulties in following the lessons. It was a bit problematic to both watch and practice.
Digital Applications Used in Education and Online Teaching Methods	Beneficial	15	T8: I have been teaching online with my students for several weeks and I had the chance to share the practical details you taught with them, so I can practice in the field.
	Rich in content	8	T9: I had never thought that I could learn so many apps in such a short time.
	Providing permanent learning based on practice	9	T6: Hands-on digital applications have provided us with a more permanent learning. These digital applications will play a significant role in boosting the classroom interaction
	Knowledge and skill development	5	T7: I got to learn applications that I had already used but had no idea about their contents and features. I can say that I have learned a number of teaching methods and technologies that I have heard of but have not used in any way before. I learned new applications that I was not aware of in any way, and thanks to your completely innovative lessons, we can enrich our content.
Changes in Participants' Acquisitions in Technological Competencies	Use of different training programs	6	T8: Google Drive has impressed me a lot; everyone will see my comments regarding the projects while working with my students on a project basis. I firmly believe that project-based education will provide me with new opportunities. I know how to use Power Point, however, using Google Slide is much more practical and time-saving, especially when accessing resources, and when adding images and videos. Google Forms has been a miracle for me; it has made my work much easier and faster. Google classroom is so wonderful.
	Preparing lessons on online platform	5	T17: I realized that I could help my students be a part of the whole learning process, not only by watching, but also by taking part in online activities.
Perceptions regarding the training	Beneficial	17	T4: It was very difficult to attract the attention of the students with the traditional education approach. I had been thinking about what we could do. Thanks to this, we have learned a lot. I am very excited to put it into practice as soon as possible
	Opportunity to use and apply instructional technologies	4	T8: In line with the feedback from my students and parents, I can also put forward the view that this training is beneficial in terms of what it has contributed to me.
	Turning the crisis period into an opportunity	9	T16: It was very nice to learn and experience something new together with my colleagues by turning the crisis period into an opportunity.

4.   Discussion

The COVID-19 pandemic has initiated a rapid digital transformation in societies and students and teachers as well as their families, school administration and society as a whole had to make significant adjustments to this period. Teachers and schools had to undergo this unexpected digital transformation without being fully prepared to meet the requirements of children's basic education. While some teachers showed great flexibility, creativity and perseverance in responding to the challenging situation of COVID-19, others encountered significant difficulties. More thought and emphasis need to be given on the empowerement of teachers, enhancements of the schools' technology and teacher education to enable teachers to take on a leader role in the digital transformation of education [18].

Another study examines the professional competencies of teachers working in secondary education institutions. They stated that teachers had difficulties in providing student motivation and preparing suitable digital materials for the lesson during the Covid-19 process, and they participated in the technological skill development trainings provided during this process [19].

During the Covid-19 pandemic, Uganda has taken teacher education as an education policy and made recommendations on teacher candidates who have the competencies required for 21st century skills and how these skills will be improved [20].

The "Next Generation Teacher Training" held during the COVID-19 pandemic was designed to assist the teachers at a time in which schools were closed and starting emergency distance education was starting. The online training provided the teachers with the opportunity to learn about online applications or improve their competencies in using these apps in delivering synchronous or asynchronous courses to their students through online learning modalities. The "New Generation Teacher" training gathered teachers with different technological competencies under a single online-learning platform. Within the scope of the study, the positive and negative aspects of the online in-service teacher training and its effectiveness have been investigated and unveiled. Ensuring the digital transformation of the teachers during the COVID-19 pandemic process is among the goals of this study. Since the ADDIE model has been adopted as the instructional design model of the training, teachers, who participated in the training online, experienced almost no problems in developing or improving their technological competencies. The online training provided a platform where all participants with different competencies worked collaboratively and contributed to each other. Izquierdo &Carabajo (2021), Acting as the teachers of their colleagues, summarized their experience of collaborative education. The educational program consisted of three phases. The aim of the program was to train teachers in designing, implementing and using technological tools online. They also conducted a workshop which also aimed at motivating and improving the emotional state of teachers, who were adversely affected by being subject to isolation due to the COVID-19 quarantine. This process has gradually empowered teachers' ability to use ICT tools, while also engaging in real-life communication, helping teachers start the new online academic term in a positive manner [21]. Due to the pandemic conditions, people and institutions now spend more time online more than ever before. Due to the extensive use of the internet, internet access or poor internet connection have become significant problems in our country. This is an important issue that has negative effects on many activities. Poor internet

connection has inevitably affected us negatively in terms of delivering the teacher training program online. This issue was underlined by some participant teachers while answering the questionnaire. Since the online teacher training was carried out with practical implementations, teachers with low technological competencies experienced difficulties using online applications at the beginning of the program. Consequently, those who did not know anything or knew a little about how to use online learning apps and modalities have had the opportunity to improve themselves and use these apps and modalities effectively. In general, the fact that they use what they have learned in this training in their online classrooms shows that this training has initiated a digital transformation in teachers. Considering the uncertainties experienced by teachers all over the world in this process, the teachers who participated in this training stated that they were very happy to turn this crisis period in education into an opportunity. Montoya and González (2019) emphasized that teaching models should be developed for in-service training. It also concluded that digital resources, events and courses should increase [22]. Teachers need more knowledge of tools to design digital resources to support their virtual environments [23] and they are also in need of more pedagogical and technological assistance from experts in the design of the virtual environment [24].

5.   Conclusions and Future Studies

The urgent need for distance education due to the pandemic has led teachers to develop their technological competencies, which may otherwise last a span of many years. This study was carried out in order to reveal the positive and negative aspects of online in-service training and to ensure the necessary changes in the digital competencies of teachers during the COVID-19 pandemic. The research carried out during the pandemic has revealed the areas required in order for teachers to improve their professional development. This study will shed light on future studies.

The negative aspects of online teacher training revealed in this study can be taken into account and solutions can be generated or proposed in the studies to be carried out on this issue. Furthermore, taking into account the desire of teachers to work collaboratively, future studies can be tailored to address the need to produce digital content based on the collaborative project-based work of teachers. In this regard, this study constitutes a solid ground for future studies on this issue.

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