

A KIRKPATRICK MODEL PERSPECTIVE ON THE TRANSFORMATIVE
POWER OF THE DIGITAL TEACHERS PROJECT

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SERHAT ORHAK

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POWER OF THE DIGITAL TEACHERS PROJECT**

submitted by **SERHAT ORHAK** in partial fulfillment of the requirements for the degree of **Master of Science in Computer Education and Instructional Technology, Middle East Technical University** by,

Prof. Dr. Halil Kalıpçılar
Dean, Graduate School of **Natural and Applied Sciences** _____

Prof. Dr. Soner Yıldırım
Head of the Department, **Computer Education
and Instructional Technology** _____

Assoc. Prof. Dr. Göknur Kaplan
Supervisor, **Computer Education
and Instructional Technology, METU** _____

Prof. Dr. Kürşat Çağiltay
Co-Supervisor, **Computer Science and Engineering,
Sabancı University** _____

Examining Committee Members:

Prof. Dr. Hanife Akar
Educational Sciences, METU _____

Assoc. Prof. Dr. Göknur Kaplan
Computer Education and Instructional Technology, METU _____

Assist. Prof. Dr. Berkan Çelik
Computer Education and Instructional Technology,
Van Yüzüncü Yıl University _____

Date: 05.09.2023

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Surname : Serhat Orhak

Signature :

ABSTRACT

A KIRKPATRICK MODEL PERSPECTIVE ON THE TRANSFORMATIVE POWER OF THE DIGITAL TEACHERS PROJECT

Orhak, Serhat
Master of Science, Computer Education and Instructional Technology
Supervisor: Assoc. Prof. Dr. Gökür Kaplan
Co-Supervisor: Prof. Dr. Kürşat Çağıltay

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The present research evaluates the impact of the Digital Teachers Project (DTP) training on teachers' learning, behavior, and contributions to their institutions. The DTP provided synchronous and asynchronous online training on various subjects to enhance digital literacy and competence skills of the teachers and encourage the application of this knowledge in their schools. The evaluation of the effects follows Kirkpatrick's 4-level training evaluation model, which offers a structured approach to assess the training from different perspectives. The study follows an evaluation research approach and utilizes different sources of data, including a comprehensive questionnaire blending quantitative and qualitative questions, achievement scores of the participants, and satisfaction survey. The research questions guiding this investigation delve into satisfaction of the participants, the acquisition of targeted digital literacy competencies, the influence of the training on workplace behaviors, and the extent to which participants have contributed to the advancement of their schools. The data is collected from 222 teachers who participated in various semesters of the DTP. The results show that the DTP successfully accomplishes the

four levels of the Kirkpatrick Model. Findings reveal that the project enhanced digital competencies of the teachers and led to the adaptation of various digital tools for enriched teaching practices. The participants also transferred their knowledge to colleagues and institutions. This research serves as an invaluable resource for stakeholders, highlighting the prominent impacts of the DTP, and showing the impacts of the development of efficient and effective teacher training programs.

Keywords: Teacher Training, Digital Literacy, Digital Technologies, Kirkpatrick Model, Technology Integration

ÖZ

KIRKPATRICK MODELİ BAKIŞ AÇISIYLA DİJİTAL ÖĞRETMENLER PROJESİNİN DÖNÜŞTÜRÜCÜ GÜCÜ

Orhak, Serhat
Yüksek Lisans, Bilgisayar ve Öğretim Teknolojileri Eğitimi
Tez Yöneticisi: Doç. Dr. Göknur Kaplan
Ortak Tez Yöneticisi: Prof. Dr. Kürşat Çağiltay

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Bu araştırma, Dijital Öğretmenler Projesi (DÖP) eğitiminin öğretmenlerin öğrenmelerine, davranışlarına ve kurumlarına katkılarına etkisini değerlendirmektedir. DÖP, öğretmenlerin dijital okuryazarlık ve yeterlilik becerilerini geliştirmek ve bu bilgilerin okullarında uygulanmasını teşvik etmek amacıyla çeşitli konularda senkron ve asenkron çevrimiçi eğitimler sunmuştur. Etkilerin değerlendirilmesi, eğitimi farklı açılardan değerlendirmek için yapılandırılmış bir yaklaşım sunan Kirkpatrick'in 4 aşamalı eğitim değerlendirme modeline göre yapılmıştır. Çalışmada değerlendirme araştırması yaklaşımı izlenmiştir ve nicel ile nitel sorulardan oluşan kapsamlı bir anket, katılımcıların başarı puanları ve memnuniyet anketi dahil olmak üzere farklı veri kaynakları kullanılmıştır. Bu araştırmaya yön veren araştırma soruları; katılımcı memnuniyeti, hedeflenen dijital okuryazarlık yeterliliklerinin edinilmesi, eğitimin işyeri davranışları üzerindeki etkisi ve katılımcıların okullarının ilerlemesine ne ölçüde katkıda bulduklarını içermektedir. Veriler DÖP'ün farklı fazlarına katılan 222 öğretmenden toplanmıştır. Sonuçlar DÖP'ün Kirkpatrick Modeli'nin dört düzeyini de başarıyla yerine getirdiğini göstermektedir. Bulgular, projenin öğretmenlerin dijital yeterliliklerini geliştirdiğini ve zenginleştirilmiş öğretim uygulamaları için

çeşitli dijital araçların uyarlanması vesile olduğunu ortaya koymaktadır. Katılımcılar, bilgilerini meslektaşlarına ve kurumlara da aktarmışlardır. Bu araştırma, DÖP'ün önemli etkilerini vurgulayarak, verimli ve etkili öğretmen yetiştirme programlarının geliştirilmesinin etkilerini göstererek paydaşlar için paha biçilemez bir kaynak oluşturmaktadır.

Anahtar Kelimeler: Öğretmen Eğitimi, Dijital Okuryazarlık, Dijital Teknolojiler, Kirkpatrick Modeli, Teknoloji Entegrasyonu

To my beloved Mother

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LIST OF ABBREVIATIONS

AR: Augmented Reality

cGPA: Cumulative grade point average. It is calculated based on the grades of the learners through a specified formula.

DTP: Digital Teachers Project

EBA : Eğitim Bilişim Ağı (“*Educational Informatics Network*”)

FATİH: Fırsatları Arttırma ve Teknolojiyi İyileştirme Hareketi. “*Movement of Enhancing Opportunities and Improving Technology*”.

HEC: Higher Education Council. It is equally referred as “Council of Higher Education” as well.

ICT: Information and Communication Technologies

ICTRC: Information and Communication Technologies-Related Courses

IT : Information Technology

K-8: Educational levels from kindergarten to eighth grade

LMS : Learning Management System

MoNE: Ministry of National Education

ÖBA: Öğretmen Bilişim Ağı (“*Teachers’ Informatics Network*”)

TPACK: Technological Pedagogical Content Knowledge

TÜBİTAK: Scientific and Technological Research Council of Türkiye

VR: Virtual Reality

3D: Three dimensional

CHAPTER 1

INTRODUCTION

In this chapter, the background of the study, statement of the problem, purpose and significance of the study is covered along with the short description of the Digital Teachers Project (DTP), which constitute the object of the current study and the definition of certain concepts used throughout the study.

1.1 Background of the Study

The integration of digital technologies in education has become extremely important for preparing students for the challenges of today's rapidly evolving digital age. It has the potential to enhance student engagement, facilitate personalized learning experiences, and develop essential 21st century skills such as critical thinking, collaboration, and digital literacy (Delors, 1998). In fact, incorporating tools and resources in schools can improve learning by encouraging curiosity and connecting new and existing knowledge while addressing important societal issues (Hackbarth, 1996).

However, many teachers struggle with incorporating digital technologies into their lessons (Haleem et. al., 2022). For that, it is crucial to equip teachers with digital competencies to ensure that students are prepared for both their future careers and life in general (Starkey, 2020). By providing comprehensive and ongoing training programs, teachers can develop the necessary skills to effectively integrate digital tools into their teaching practices. In fact, studies have shown that well-designed professional development programs can significantly enhance teachers' digital

competencies and positively impact student learning outcomes (Law et al., 2008; Tondeur et al., 2012).

The Ministry of National Education (MoNE) and Higher Education Council (HEC) of Türkiye provide teachers with some ICT courses and in-service trainings to develop their skills to understand and integrate digital technologies into their classrooms. Besides, there are private institutions and non-benefit projects that help teachers to develop those skills. One of these projects is the Digital Teachers Project (DTP), which is funded by ING Bank, and conducted by the professors from Middle East Technical University (METU) with the help of a non-governmental organization named HABİTAT Derneği ("*HABİTAT Association*"). The Digital Teachers Project aims to make a significant contribution to Türkiye's digital transformation by increasing the digital literacy skills of teachers in state schools. Thus, it is selected as the object of this study to examine whether it realizes its aim or not. In other words, its effects on the participatory teachers' skills and knowledge are evaluated to see if the teachers transfer their knowledge to their workplace and help improving the quality of their educational practices.

1.2 Statement of the Problem

Although there have been courses and trainings for improving the teachers' digital skills, the evaluation of ICT courses' effectiveness from various stakeholders' perspectives has been found to be limited (Göktas, et al., 2008). Also, some of the researchers claim that teacher training programs frequently fall short in preparing the teachers of tomorrow with the important digital skills they need (Fernández-Batanero et al., 2022; Gudmundsdottir & Hatlevik, 2018).

Besides, a brief literature review puts forth that, most of the conducted studies often focus on the perception, practice, and knowledge of pre-service teachers (see Akayoğlu et al., 2020; Akbulut et. al., 2011; Baltacı-Goktalay & Ozdilek, 2010; Dinçer, 2018; Üstündağ et al., 2017; Günes, and Bahçivan, 2018). Still, focusing on

the practices and knowledge of in-service teachers can be more advantageous rather than focusing solely on pre-service teachers as the latter lack practical experience in the classroom.

Additionally, studies often use convenient sampling or cluster sampling methods, which yield to data from specific groups or regions that end in results which can only be generalized to such groups or regions (see for example Çimen & Hangül, 2021; Kahveci et al., 2011; Kara & Cagiltay, 2017; Reisoğlu, 2022;). However, it would provide more comprehensive and generalizable results if the study is conducted with the teachers from different locations and subject matters.

Lastly, not only specific resources such as time, money, materials, human power etc. are needed to develop and implement such training, but also similar resources such as time and money are needed to be invested by the participants to participate such training. Every training, let it be of charge or free of charge, should be evaluated to see if they achieve their outcomes and the resources are spent for meaningful results (Kirkpatrick & Kirkpatrick, 2007).

1.3 The Context of the Study: The Digital Teachers Project

The Digital Teachers Project (DTP) is a free training program funded by Turkey branch of ING Bank and designed and conducted by the professors and trainers from Middle East Technical University (METU), with the support of a non-governmental organization named Habitat Association in terms of logistics and organization. The three partners started to develop the main framework of DTP as of July 6, 2020, aiming to “contribute to digital transformation in education by increasing and improving the digital competencies of teachers who have difficulties in using digital technologies in their classes, especially in the course of the emergency remote education” during COVID 19 epidemic (Kaplan, Çağiltay, Kara Aydemir, Çelik, & Tunga, 2022).

DTP's kick-off on November 16th, 2020, started the first period of the project when the effects of pandemic was at its top level and the schools were on a lock-down just as the countries all over the world. DTP has successfully completed six semesters within three years up to now. It seems to be sustainable and is up and running for its seventh semester, which is planned to start on October 01, 2023. The call for participation to the project's new semesters can be followed on the official page (www.dijitalogretmenler.com) which includes all the related information and announcements about the project and examples from the previous semesters of the project as well as a bridge to a second website that hosts the learning management system (LMS) which contains the learning materials and user profiles of DTP (www.egitim.dijitalogretmenler.com).

The fundamental educational principle of the DTP is to help teachers use the technology as a leverage in their educational context. The DTP uses the flipped learning model for the teaching methodology and is built upon "learning by doing" philosophy by Dewey (Kaplan, Çağiltay, Kara Aydemir, Çelik, & Tunga, 2022). By following this philosophy, DTP aims to train 1000 primary and lower-secondary school teachers through a 10-weeks training program, which constitutes the main part of the designed curriculum (Phase I). Complementary to Phase I; a separate curriculum for "virtual and augmented reality technologies in education" training (Phase II) was designed and developed by METU for the top ranked 100 teachers, who completed the first phase. Detailed information about the two phases are as follows:

1.3.1 Phase I of the Digital Teachers Project


By blending the strengths of distance and face-to-face education, and utilizing a flipped learning approach" in line with the "learning by doing" philosophy, the first phase of DTP was planned as a 10-week training; where participants are expected to complete asynchronous interactive e-lessons and attend synchronous classes (Kaplan, Çağiltay, Kara Aydemir, Çelik, & Tunga, 2022, p.1).

The asynchronous classes are consisted of five main modules including such topics like digital citizenship and internet security; creativity and visual design (infographics, effective presentations, video and animations); critical thinking and measurement and evaluation (see Figure 1.1.) and offered via the project's learning management system (LMS) which holds the user profiles besides these learning materials (www.egitim.dijitalogretmenler.com). Each of the modules included various scales for evaluation; assessment forms; useful and additional complementary documents besides the SCORM packages of the interactive e-lessons. These SCORM packages packed up short videos, interactive applications and mini, self-evaluation tests related to each "content developed with an interdisciplinary approach" (Kaplan, Çağiltay, Kara Aydemir, Çelik, & Tunga, 2022, p.1).

Furthermore, participants attend to five online synchronous classes, one each week, conducted via video conference offered by trainers who are experts in the field of educational technology. As the DTP uses flipped learning method, these classes are parallel to the modules with the asynchronous content. However, the main objectives of these classes are (1) to fix any misconceptions or misunderstandings and answer learners' questions about the topic or the tools, (2) to explain the topic in a more detailed format while reflecting new updates to the topics and tools, (3) show the real time usage of tools, (4) brainstorm about the usage of tools in the educational context of different subject matters, (5) share ideas among the participants, and (6) increase the feeling of community of practice in the participants by encouraging them to cooperate and communicate more during and after the sessions.


Modules on LMS

01 **Digital Citizenship and Security**




Unit 1 - Digital citizenship and security
Unit 2 - Increase your digital security

02 **Creativity and Visual Design (Infographics)**




Unit 1 - Visual design principles
Unit 2 - Infographics design with Canva

03 **Creativity and Visual Design (Photo&Video)**




Unit 1 - Powtoon
Unit 2 - Video and Photos

04 **Impressive Presentations**



Unit 1 - Psychological principles and making impressive presentations
Unit 2 - Creating presentations with Google Slides

05 **Critical Thinking & Assessment and Evaluation**



Unit 1 - Assessment and evaluation tools (Kahoot & Google Forms)
Unit 2 - Critical Thinking

Figure 1 The modules and their content in the DTP.

As mentioned above, the DTP is based on the “learning by doing” philosophy. That’s why, the participants are required to complete a few hands-on assignments (homework) that ask them to utilize the tools they learn throughout the project and create educational contents. The number of the assignments are between three to five for each semester, depending on the time limitations. The trainers grade the tasks according to the specifically prepared rubrics, which are shared with the participants when they are assigned to the task.

As for theoretical topics – such as “digital security”, “digital citizenship”, “increasing internet security and privacy” – which do not require learning and use of specific technological tools, participants are asked to complete online tests on the LMS instead of creating educational contents, to assess their learning.

What is more, in addition to the synchronous classes, there are also a few online seminars offered in the course of first phase. The seminars are given by professors or specialists on different topics, which are decided on regarding the needs and requests of the teachers, such as “the past, today and future of educational technologies”, “21st century competences in education”, “gamification”, “psycho-social support for teachers”, “meeting the needs of special education students”, “sustainability”, “managing different generations”, etc. They are usually conducted at the weekends and participants are required to attend these seminars as well.

After all the modules and the related assignments are completed, the participants complete the first phase of the designated semester and the assessment of their performance is compiled based on:

- their grades from the assignments,
- their scores from online tests,
- logs regarding their attendance to online sessions,
- logs regarding the completion rates of asynchronous classes,
- logs regarding their attendance to online seminars.

The calculations are done automatically according to a specific formula with the weighted average for each item on LMS and a final score for each participant is calculated. These final scores are then double-checked by trainers to control any probable mistakes by automatic calculations. Based on these scores, participants receive either a “certificate of participation” for their attendance and completion of modules or a “certificate of achievement” for their attendance and completion of both the modules and designated assignments. Beside these certificates, based on their ranking regarding the completion scores, the top 100 participants are selected to move forward to the second phase (Phase II) training on “virtual and augmented reality technologies in education.”. However, it should be noted that the number of the top 100 may sometimes be as high as up to 120, due to same or very close completion scores among the participants, where it would be unfair to cut-off the first 100.

1.3.2 Phase II of the Digital Teachers Project

The second phase offered to the top participants regarding their rankings based on their completion scores they achieved at the end of Phase I, is named as “Virtual and Augmented Reality (VR/AR) Applications in Education”. This training is composed of one module that includes two asynchronous e-lessons: (1) Virtual and Augmented Reality in Education; and (2) CoSpaces. Complementary to this asynchronous part, a 3- to 4-hour long synchronous class is conducted via video conference offered by trainers who are experts in VR/AR and its educational use.

Before the content for asynchronous e-lessons is unlocked for the participants who completed the Phase I and are selected to move forward to the second phase based on their rankings, they receive a shipment including a box with (1) one VR headset for teacher use, and (2) 20-25 cardboard VR kits for their students’ use and (3) a professional account subscription for CoSpaces that enables them to access and use all pro-features of this software.

Due to the limited budget and relatively expensive VR equipment offered in Phase II, the synchronous class and the VR kits are provided only to those top ranked participants. However, even if not everyone is provided with VR kits, all participants who complete the first phase successfully are also provided with access to the asynchronous classes on this module so that they have an opportunity to learn about AR/VR technologies and find ways to integrate them into their educational practices.

The first asynchronous e-lesson in the module in Phase II aims to inform the participants about the types of virtual reality technologies, foundations of AR/VR technologies, working principle of AR/VR devices and examples for various use of AR/VR in different fields. The second one contains the step-by-step instructions on how to use the cloud-based online software, namely “CoSpaces”. The software allows users create a 3D environment easily, program this environment using block-based coding for animations, interactions, etc. and publish their product to be used either as VR on headsets or as AR on mobile devices. It requires a paid subscription to use the software to its fullest and teachers enrolled in this second phase are provided with subscriptions that is covered from the project budget to use the platform without any personal payments. At the end of this module, participants are also given an assignment that includes basic tasks to perform on CoSpaces to practice what they learn to be completed before the synchronous session. The assessment of assignments is also completed by trainers and feedbacks are provided before the synchronous session.

As for the synchronous class, a 3- to 4-hour long session is organized via video conference, where trainers in the project collaboratively conduct the session to go over the theoretical part briefly to fix any misconceptions or misunderstandings, show the usage of VR kits sent to the participants, demonstrate the use of the 3D environment creation software in real time, and answer participants’ questions in general about VR/AR and its educational use. Once the synchronous session is completed, the designated semester of the project is deemed to be officially complete and the preparations for the project’s upcoming semester starts. However, the participants are followed via their postings hash-tagged with #dijitalogretmenler (or

#dijitalöğretmenler, #DijitalOğretmenler) on social media and the “digital teachers” community on Facebook (<https://www.facebook.com/groups/dijitalogretmenler>).

In a nutshell, DTP designed as an aid for elementary and lower-secondary school teachers to provide them with necessary knowledge and skills to deliver more effective classes with the help of digital technologies, which in the long run would make a significant contribution to Türkiye’s digital transformation by increasing public school teachers’ digital literacy.

1.4 Purpose of the Study

The main aim of this study is to investigate the effects of the Digital Teachers Project (DTP) on teachers and schools/institutions. Within the scope of the project, synchronous and asynchronous online trainings were provided on various subjects so that the teachers could acquire digital literacy and competence skills and transfer this information to their classrooms and schools. In the present study, the effects of these trainings on teachers’ learning, behavior and contributions to their institutions were evaluated by utilizing Kirkpatrick’s (1976) 4-levels of training evaluation model. Accordingly, answers to the following research questions are sought:

- Research Question 1: How satisfied are the participants with the Digital Teachers Project?
- Research Question 2: To what extent did participants acquire the intended knowledge and skills in terms of digital literacy?
- Research Question 3: How did the training program impact participants’ behavior at their workplace?
- Research Question 4: As a result of the training program, how did the participants contribute to the development of their schools/institutions?

1.5 Significance of the Study

Majority of research studies about teacher education/training in the literature are conducted with participation of *pre-service teachers* and focuses on their practices. However, it is not meaningful to study their practices as they have not been in the classroom environment yet. The main focus of such research should be on the practices, skills and knowledge of *in-service teachers* to have a deeper understanding about their genuine in-class experiences, to figure out their needs and the limitations or deficiencies they face with, and to provide implications for the practice that works. By bringing in-service teacher's opinions and actions to the focus; this study aims to address this gap and contribute to the existing literature on teacher education by providing insights and suggestions for stakeholders/policymakers to develop much more effective curriculum and training programs for teacher education. Thus, the first and foremost significance of the present study comes from its participants, who are *in-service teachers* actively working in public schools, which offers the opportunity to collect data from *teachers*, not *preservice-teachers* or *teacher candidates*, regarding their practices *in real-life classrooms* rather than simulated environments or interventions.

Secondly, the teachers participated in the study were from various subject matters, who were enrolled in public schools of different levels that were located in 43 different cities in Türkiye, which provided the advantage of having opinions about teachers' practices from various regions all around the country. Moreover, participant teachers also provided an insight related to their practices and contributions they provided to their institutions, colleagues, and students. This made it possible to see the effects of the training from different perspectives that contributed to have a better and deeper understanding about such effects.

Lastly, as Kirkpatrick & Kirkpatrick (2007) emphasizes, it is important to evaluate a program because it makes sure that the program has satisfied the needs of stakeholders for the problem at hand, that the program is conducted through the best way possible and that the resources used has yield to useful and meaningful outcomes.

Bringing up all together, the present study differs from many studies in the literature and fills the gap by providing insights from different perspectives and real classroom environments, showing the return of investments dedicated to teacher training, and presenting meaningful suggestions for the stakeholders for improving the future training programs.

1.6 Definitions of Terms

In this study, Information and Communication Technology (ICT) is used to refer to a wide range of technologies and practices used for processing, storing, retrieving, and communicating information (Cambridge Dictionary, n.d.) within educational context. In education, ICT involves integrating technology tools such as computers, internet, learning management systems (LMS), interactive white boards, educational software and apps, online research databases, and mobile devices etc. These tools enhance learning experiences, promote engagement, facilitate access to resources, and support interactive and collaborative activities in educational settings.

Unless it is specified intentionally, the term “technology”, is used to refer to the “digital technologies” such as computers, software, and networks etc. throughout this thesis, rather than its over-encompassing meaning that includes basic technologies such as pen, blackboard, or lever. In the context of education, digital technologies denote to the utilization of digital tools, applications, and platforms to enrich and optimize teaching, learning, and administrative procedures. The examples are those given in the definition of ICT in education above.

Lastly, similar to Bloom's (1956, p.38) definition of "possessing a skill" as being able to enact prior knowledge, use information to complete a task, solve a problem, etc.; teachers' *digital skills* is used to denote their ability to effectively utilize digital technologies for enhancing instruction, fostering student engagement, and facilitating meaningful learning experiences. This involves integrating digital tools, methodologies, and platforms into instruction, curriculum design, assessment practices, and communication methods. Such digital skills are needed for being *digitally literate*, which is defined as being "competent enough to live, learn and work safely and ethically in a digital world" (Kaplan & Paşalı, 2023).

1.7 Summary of the Chapter

The opening chapter stressed the significance of incorporating digital technologies in education. It highlighted the issue of not just having access to ICT tools, but also ensuring that teachers had the necessary skills to use them efficiently in their classrooms. Based on this significant issue, this study aimed assessing the impact of a particular case, namely "the Digital Teachers Project" on teachers and institutions, taking into consideration various factors such as satisfaction, knowledge and skills, behavioral changes, and contributions to schools. The research stands out from previous studies by focusing on in-service teachers, rather than pre-service teachers, from diverse regions and branches. Additionally, the Digital Teachers Project was introduced as a training program that aimed to enhance teachers' digital literacy skills through a flipped learning approach, offering both asynchronous and synchronous classes, practical tasks, and online seminars.

CHAPTER 2

LITERATURE REVIEW

This chapter covers a brief history of ICT tools in Turkish schools, ICT courses in teacher education curriculum and in-service teacher trainings in Türkiye, Kirkpatrick's 4 levels evaluation model as the theoretical lens used in the study.

2.1 Turkish Education Policy

The education policy of Türkiye is based on the principles of secularism, republicanism, and nationalism. Compulsory education is 12 years long, starting at the age of 6. Türkiye adapted a system called "4+4+4 education system" for primary and secondary education in 2012. The education system according to this system is divided into three levels: primary education (grades 1-4), lower-secondary education (grades 5-8), and upper-secondary education (grades 9-12). The Ministry of National Education is responsible for the administration of the education system.

The National Education Basic Law (1976) and 11th Development Plan (2019) indicates that the main aim of the education in Türkiye is to foster individuals with strong critical thinking, problem-solving, self-confidence, and a spirit of entrepreneurship and innovation. These individuals should also internalize democratic values, national culture, and have an appreciation for the arts.

Moreover, according to the 11th Development Plan (2019, p.137-143) the Turkish government aims to enhance education via digital technologies by implementing network infrastructure, promoting teacher and administrator professional development, and tailoring in-service training to address current needs. OECD (2020) reports that Türkiye has made significant progress in education in recent

years, but there are still some challenges that need to be addressed. The most important challenges include equity and quality of the education. The report recommends that Türkiye needs to increase funding for education, reform the curriculum to focus on critical thinking and problem-solving skills and improve teacher training and development.

2.2 Digital Technologies in Turkish State Schools

Digital technologies have gradually made their way into Turkish public schools, influenced by the global shift towards technology integration in education. The evolution of digital technologies in Turkish education can be traced back to the late 1980s when the Ministry of National Education (MoNE) and private or governmental organizations launched initiatives to introduce ICT tools in schools. This early phase of technology integration laid the foundation for the subsequent advancements in digital educational technologies. Various initiatives and projects were launched to enhance technology infrastructure and provide teachers and students with access to digital resources. These efforts aimed to decrease the gaps and ensure equal opportunities for all students to acquire digital skills. However, the scale and effectiveness of these initiatives varied across different regions and schools.

One of the earliest projects was “New Information and Communication Technologies” launched in 1984, that started usage of computers in Turkish schools (Uşun, 2013). However, the project mainly aimed at equipping special high schools with computers. The project led to train teachers on how to use and integrate those technologies and urged the ministry to hold conferences on computer-assisted education (Erümit et. al., 2020). Afterwards, a few more projects, namely “Industrial Schools (between 1985-1994)” “Informal Vocational Education (between 1987-1995)”, and “Enhancing the National Education (between 1990-1999)”, were also

started by MoNE with the support of World Bank (Erümit et. al., 2020). Those projects also contributed to the possession of ICT tools at schools, and training of teachers and the learners. Although the schools were equipped by ICT tools at those times, it should be noted that the infrastructure, such as educational materials, connections, specifications of devices, was still in its development stages, and the first internet connection in Türkiye was successfully completed on 12th of April 1993 by METU (Çağltay, 1997)

During 1997-1998, the “Primary Education” project was launched with the support of World Bank. The main goal of the project was to equip schools with computers, support computer-aided education, develop educational software and games, and integrate ICT into education. Thanks to the project, thousands of schools were provided with computers, printers, overhead projectors, and computer software. Addition to that, the computer education teachers who were responsible for maintaining and providing technical support for those devices and other subject matter teachers were provided with in-service trainings (as cited in Erümit et. al., 2020). Moreover, “Computer” course was added to the curriculum of primary schools for the first time in 1998. “Primary Education” project was completed in two phases and increased the quantity of devices in the second phase. The project was followed and backed up by “Catching up with the modern age in education - 2000” project in 1997 (Erümit et. al., 2020).

During 2003-2015, there were significant improvements and movements to increase the technological resources at schools (Erümit et. al., 2020). Many of the schools were provided with stable internet connection, councils and conferences on information technologies were held, the number of open education systems increased, educational software (such as DynED and MEB Vitamin) were used, EBA platform was launched, and the curriculum was renewed etc. However, probably the most significant milestone in the history of digital technologies in Turkish public schools is the “Movement of Enhancing Opportunities and Improving Technology” (FATİH) Project (FATİH Project, n.d.). Launched in 2010 and still ongoing, the FATİH Project aims to significantly contribute to the education system by equipping

schools with technology infrastructure, including smart boards, tablets, computers, and internet connectivity. The government initiated the project to decrease the disadvantageous situations among different regions of Türkiye by providing or improving the infrastructure and facilities of those schools. The project seeks to create a digital learning environment that promotes interactive and collaborative learning, empowers teachers, and enhances students' digital skills. Thanks to the project, more than half a million tablet computers and more than 300 thousand interactive smartboards were distributed to schools around the country. Not only the devices, but also the software and educational online contents were also developed and distributed to the schools with time.

However, one critical factor that significantly influences the success of digital integration is the competence of teachers in utilizing digital technologies in the classroom (Çimen & Hangül, 2021; Instefjord & Munthe, 2017; Kim et al., 2013). Educators possessing those competencies can integrate digital technologies into their curricula as indispensable components and promote students' digital learning and involvement (Dinçer, 2018). Yet, it can be seen in the literature that while minority of the teachers have embraced digital technologies and incorporated them into their teaching practices, many still face barriers and lack the necessary skills and pedagogical knowledge for effective integration (Çelik et al., 2017; Gudmundsdottir & Hatlevik, 2018; Somyürek et al., 2009).

2.3 ICT Courses in Teacher Education Curriculum

Council of Higher Education (“YÖK”) of Türkiye or commonly referred in the literature as Higher Education Council (HEC) of Türkiye, is responsible for the planning, coordination, and supervision of higher education in Türkiye. HEC undertook a curriculum overhaul for teacher education programs in 1998 with the main objectives of enhancing the overall quality of these programs and integrating

ICT into them (Göktas, et al., 2008). Besides, “computer education and instructional technologies” department at universities, which is responsible for educating computer course teachers at schools, were opened in 1998 (Erümit et. al., 2020).

Odabaşı (1998) states that the schools in Türkiye were equipped with the computers in 1984. Yet, although the computers had a history of more than a decade in schools by 1998, most of the teachers did not have a formal education for the use of computers. Addition to the situation of having insufficient courses in 1998, the curriculum did not change much in 2018 either. According to HEC data, the national teacher education programs of almost all the teacher subject matters, except for the computer education teachers, include one or at most two compulsory ICT-related courses under the names of “instructional technologies” and “information technologies” (YÖK Öğretmen Yetiştirme Lisans Programları, 2018). These courses are mainly aimed at equipping the teachers with the basic computer usage skills and some educational tools.

2.4 Trainings for In-Service Teachers in Türkiye

There are many in-service training programs addressing the needs of the teachers working in Turkish public schools. It is not possible and not in the boundaries of this research to access and evaluate all these programs. Yet, I have the access to some databases of MoNE and I provide the information on the most recent official training platform for the public school teachers, named Teachers’ Informatics Network (ÖBA “Öğretmen Bilişim Ağı”). The Ministry of National Education has developed the platform to help the teachers participate in the offline training programs. As of July 2023, there are around 150 training programs that are active on the website of the platform (www.oba.gov.tr). The teachers sign into the platform with their personnel ID and password and participate in any of the programs during their available time. Some of the training topics are:

- Developing School Culture
- Museum Training
- Webpage Design
- Ethical Behaviors
- Peer Victimization
- Time Management
- Adobe Design and Editing Tools
- Mind Games
- Dealing with Addiction
- Arduino
- Drama Education
- Recycling
- Microsoft Office Tools
- Leadership
- Social Media
- Fiction Writing
- Web 2.0 Tools

Most of the trainings include few pre-recorded videos which are generally long and do not include any interactive applications. According to the information on the training descriptions, if the teachers complete the 80% of the recordings for most of the trainings, they are accepted as successful learners and get an online certificate for participation.

2.5 Teachers' Competence in terms of Using Digital Technologies

Considering the place and importance of digital technologies in our digital era, the formal education they receive is undeniably insufficient for the teachers to acquire the necessary skills and knowledge for integrating the digital technologies in their classrooms because of the fact that they do not have sufficient, comprehensive and

hands-on pedagogical courses, or in-service trainings. The lack of the programs has been emphasized out in the findings of some of the research in the literature. For example, Ardıç and Çiftçi (2019) state that while the teacher education programs in universities cover some aspects of educational technology, the depth and breadth of the training may not adequately equip teachers with the practical skills needed to effectively integrate digital technologies into their instructional practices. The teachers participating in Çelik et. al. (2017)'s study supported this claim by indicating that they often struggled with incorporating new technologies or ideas into their curriculum due to a lack of understanding on how to effectively integrate them into their lesson plans. Teachers expressed that they lacked the necessary skills to effectively use technology with their students. Additionally, as they failed to handle the technology productively, they experienced challenges in managing their classrooms, felt a loss of their leadership role, and struggled with maintaining communication and interaction with their students (Çelik et. al., 2017). Brush et. al. (2003)'s study, one of the studies conducted on the effectiveness and sufficiency of ICT courses in higher education, proved that ICT integration courses failed to meet the expectations of aspiring teachers, who expressed the need for further training and support to integrate ICT into their future classrooms effectively (as cited in Goktas et al., 2008). Another study, conducted with in-service preschool teachers, has shown that the teachers feel incompetent while working in the classrooms and expect to receiving support through the university curriculum and various programs to enhance their technological proficiency (Kara & Çağiltay, 2017). Moreover, in Göktaş, et al. (2008)'s study, it was found out that the participants preferred all course examples and applications to directly relate to the prospective teachers' future profession and subject area. It should be noted that it is possible to encourage the teachers to adopt ICT more in their classrooms by offering ICT-related courses tailored to individuals' competency levels, through suitable training (Göktaş, et al., 2008).

The urgency of addressing the incompetence of teachers in digital technologies is further highlighted by the rapid growth of remote and online learning during the

COVID-19 pandemic. The schools and universities around the world were forced to lockdown to decrease the spreading pace of the corona virus in 2020. This sudden shift to remote education, Emergency Remote Education (ERC) in the literature (Adedoyin & Soykan, 2023), emphasized the need for teachers to adapt their instructional practices – such as educational materials, teaching methodologies, classrooms, assessment methods and other face-to-face educational components – into digital platforms and engage students in meaningful virtual learning experiences. Some schools continued their education via hybrid methods, while most of them provided virtual classes only. Very little of the schools continued face-to-face classes for some period of time.

The digital competence of teachers during the pandemic is further studied in various countries around the world and low scores, which indicates teachers' lack of knowledge and practice of using digital technologies effectively, are reported by many studies in the literature (see for example Cardullo et al., 2021; Lie et al., 2020; Ogodo et al., 2021; Pressley, 2021). Teachers who were well-equipped with digital skills, on the other hand, were better positioned to navigate this transition effectively (Carrillo & Flores, 2020; Sari & Nayir, 2020). Although the effect of pandemic decreased to minimum today and the countries has mostly returned to the conditions before the pandemic, the lockdown period increased the awareness for the importance of teachers' competence in terms of digital technologies. For conducting effective and efficient online courses, and to integrate ICT tools into face-to-face education to have more effective classes, teachers need to have proper education or training on how to use and integrate those tools into their educational practices even after the pandemic (Mohamad Nasri et al., 2020; Turnbull et al., 2021).

2.6 Kirkpatrick's 4-levels Training Evaluation Model

In the present study, the effects of the trainings on teachers' learning, behavior and contributions to their institutions were evaluated by utilizing Kirkpatrick's (1976) 4-levels of training evaluation model. Kirkpatrick (1976) proposed a "4-levels of training evaluation model" for assessing the quality, objectives, and outcomes of any training program. Over the course of many years of implementation and validation in different fields, it has become the standard model for showing the success or failure of instructional activities. In fact, it is the most influential and widely used model in the literature (Bates, 2004; Reio et. al., 2017). It is commonly known as the "Kirkpatrick Model" and the article has been republished many times over the course of time with slight changes.

Moreover, Kirkpatrick and Kirkpatrick (2007, pp.3-11) define "ten requirements for an effective training program which provides guidelines for the designers to increase the positive effect of a training program for the skills, knowledge, and behaviors of the trainees.

First, the program should address the needs of the participants (Kirkpatrick & Kirkpatrick, 2007). It will be a waste of resources if the objectives of the training program do not satisfy what the learners need at their workplace. It will not be helpful to conduct a teacher training program on how to make cardiovascular surgeries, or a physician training program on how to teach English to young learners.

Secondly, learning objectives of the training program should be specified before designing it (Kirkpatrick & Kirkpatrick, 2007). This step can be accomplished by turning the needs of the trainees into measurable and specified learning objectives. There are basically three expected outcomes of the training, which are to level up the knowledge, develop skills, and change behaviors of the participants (Kirkpatrick & Kirkpatrick, 2007).

Third, the schedule of the program should be properly specified (Kirkpatrick & Kirkpatrick, 2007). As the training programs are for the fulfilling the needs of the

trainees and they should be convenient to their working conditions, the schedule should also be made according to the preferences and availability of the trainees, not that of the trainers. If not, the trainees may begin and continue the training program with negative attitudes (Kirkpatrick & Kirkpatrick, 2007).

Forth, the program should take place at a convenient place and with the appropriate amenities (Kirkpatrick & Kirkpatrick, 2007). The location, size, lightning, air conditioning, classroom equipment etc. of the place and the services provided at the place such as coffee, snacks, bathrooms, cafeteria etc. are all important elements that may affect the motivation and hence the quality of the training.

Fifth, the right people should be invited to participate in the training program (Kirkpatrick & Kirkpatrick, 2007). If the training program is specified for only teachers and it fulfills their needs, the supervisors or school directors should not be invited at the same time because it may make the participants feel uncomfortable to speak up and decrease the effectiveness of the program.

Sixth, appropriate and qualified trainers should be invited to teach the topic (Kirkpatrick & Kirkpatrick, 2007). Being the expert of the topic is not sufficient for most cases. The trainers should also communicate effectively, have the desire to teach the target group, have the abilities to manage different teaching methods (such as discussion or workshop), have the ability to report the results of the training and suggest improvements, and have the knowledge of the organizational culture.

Seventh, according to the training program and the trainee group, effective and useful techniques and agents should be occupied (Kirkpatrick & Kirkpatrick, 2007). The trainer should, for example, decide whether to use a workshop or presentation technique; a computer or pen and pencil; a group activity or individual tasks etc. depending on the program and the learners.

Eighth, the learning objectives, as specified at the beginning of the process, should be accomplished (Kirkpatrick & Kirkpatrick, 2007).

Ninth, the participants should be satisfied with the outcomes they have, and the services provided throughout the training program (Kirkpatrick & Kirkpatrick, 2007). This step is important for the accountability of the resources and the continuation of the program for the following trainee group.

Lastly and highly important, the training program should be evaluated (Kirkpatrick & Kirkpatrick, 2007). Even though the evaluation is listed as the last step, the evaluation plan and materials should be prepared at the beginning of the process. Especially for the Kirkpatrick Model, the reaction sheets, or the tools for evaluating the learning, behavior and results levels should be well specified and prepared before the training starts.

Considering these requirements and the fact that The Kirkpatrick Model is the most commonly used training evaluation model in the literature (Reio et. al., 2017), it proved to be a good fit as a theoretical framework for the current study. Besides, Kirkpatrick's model offers a comprehensive and structured method for evaluating the value of training through various perspectives and analytical levels. It adeptly assesses the training's design, delivery, and support to pinpoint areas of strength and areas for improvement, providing actionable recommendations. Moreover, it serves as a valuable tool for effectively communicating the training's results and impact to stakeholders, securing their valuable support and input.

Kirkpatrick (1976) proposed a "4-levels of training evaluation model" for assessing the quality, objectives, and outcomes of any training program (see Figure 2). The four levels in the training evaluation model that Kirkpatrick proposed are: (Level 1) Reaction; (Level 2) Learning; (Level 3) Behavior; and (Level 4) Results (Kirkpatrick & Kirkpatrick, 2006), which are explained in-detail in the following subsections.

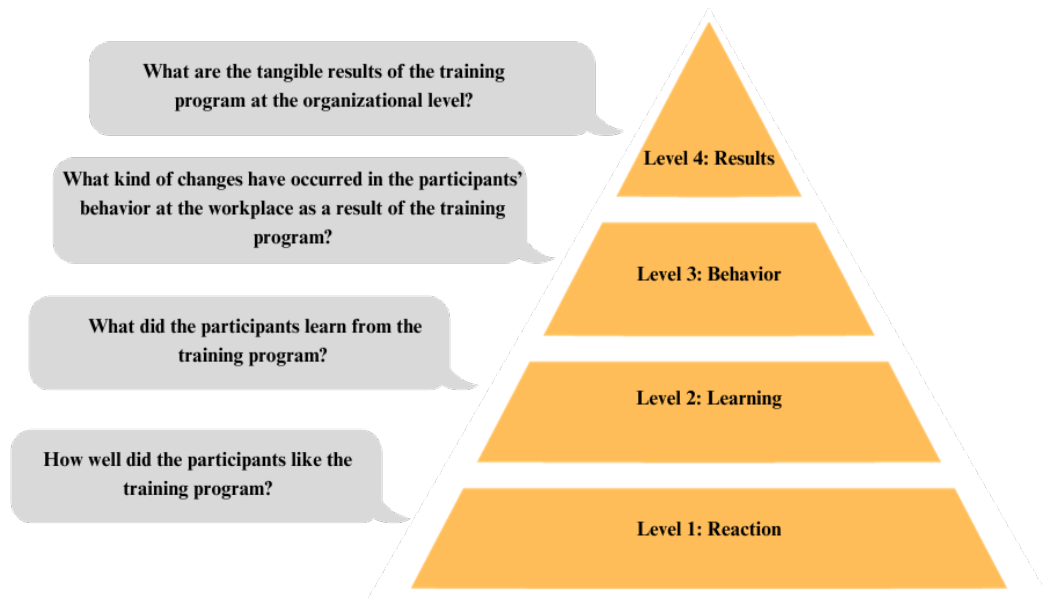


Figure 2 Kirkpatrick's 4-levels of Training Evaluation Model

2.6.1 Level 1: Reaction

The first level of the evaluation deals with the question of “How well did the participants like the training program?” (Kirkpatrick, 1976). This is basically finding out the feelings and reactions of the participants to the training program, and showing if they are satisfied with it or not. It should not be forgotten that the participants will be more motivated to attend and learn if they like the program (Kirkpatrick & Kirkpatrick, 2006).

It is quite important to find out the answer for the above question for several reasons. First, the trainer may decide to improve the future programs by modifying or redesigning it if there are meaningful complaints or low satisfactions rates (Kirkpatrick & Kirkpatrick, 2006). Secondly, it will show the participants that the

trainers give value to their opinions, and they are there to help them get better in their job (Kirkpatrick & Kirkpatrick, 2006). Lastly, it will also provide data for showing the stakeholders or the trainees the desirability of the training program (Kirkpatrick & Kirkpatrick, 2006). This level can be implemented via reaction sheets, Likert-scale questions, open-ended questions, and interviews depending on the needs and resources of the evaluator. However, it is more convenient to implement and easier to analyze the reaction sheets or Likert-scale questions.

2.6.2 Level 2: Learning

The second level of the evaluation deals with the question of “What did the participants learn from the training program?” (Kirkpatrick, 1976). At this level, the evaluator is trying to find out what kind of knowledge, skills or attitudes the participants gained thanks to the training program. Depending on the needs and resources of the evaluator, this level can be implemented via attitude surveys, paper-pencil tests or performance tests related to the content of the training. Also, it is recommended to use pretest and posttest design, if possible, in case the training aims to teach or develop the knowledge or skills the participants already have in order to ensure the knowledge increase (Kirkpatrick & Kirkpatrick, 2006). This level is important because having high satisfaction rates at the first evaluation level does not necessarily mean that the trainees acquired the knowledge and skills. Also, the change in behavior, which is the subject of third level, will not be possible if the trainees do not learn anything from the program or do not acquire any skills (Kirkpatrick & Kirkpatrick, 2006).

2.6.3 Level 3: Behavior

The third level of the evaluation deals with the question of “What kind of changes have occurred in the participants’ behavior at the workplace as a result of the training program?” (Kirkpatrick, 1976). At this level, the evaluator is trying to find out what happens at the workplace after the trainee returns from the training. It shows the evaluator how much of knowledge, skills or attitudes the trainees transfer to their working environment (Kirkpatrick & Kirkpatrick, 2006). Evaluating this level is harder and more time-consuming than the first two levels because it is not certain when the trainees will show better performance at the workplace. That’s why the evaluator should conduct this level after a certain time to allow the trainees have enough time for transferring the knowledge (Kirkpatrick & Kirkpatrick, 2006). However, the trainees may receive incentives or feedback to be encouraged to transfer their knowledge to their jobs. This impetus can be intrinsic or extrinsic motivators such as satisfaction with the job or pay increases or rewards (Kirkpatrick & Kirkpatrick, 2006). Properly prepared survey questionnaires or interviews, or both, can be used to evaluate this level effectively depending on the needs and design of the training program. Besides other evaluation reasons, the third level is also important to elucidate that the reason of failure at the fourth level, lack of outcomes at the organizational level, is stemmed from whether the ineffective training program or other follow-up procedures (Kirkpatrick & Kirkpatrick, 2006).

2.6.4 Level 4: Results

The fourth level of the evaluation deals with the question of “What are the tangible results of the training program at the organizational level?” (Kirkpatrick, 1976). These results might include but not limited to reduced costs, improved quality and quantity, workplace safety, and productivity, as well as return on investments. This level might be the hardest one to complete because the evaluator may not know what

results to look for or if the results are stemmed from the training itself. However, by designing proper questions on the program outcomes and specifying the effect of the training on the investigated outcomes, the evaluator can assess this level successfully. It is even more helpful if the training outcomes are easily observed or reported ones, such as being able to use a specific technology, increasing sales rates, reducing workload, increasing security etc. Depending on the needs and outcomes of the program, survey questionnaires, interviews, sales rates, accident rates etc. can be used to evaluate this level effectively.

2.7 Summary of the chapter

This section sheds light on Türkiye's education policy and system, highlighting its principles, structure, goals, and challenges, including the use of digital technologies to enhance education quality. Besides, it specifies the integration of digital technologies in Turkish public schools, covering areas such as teacher education curriculum, in-service training programs, teachers' competence in digital technologies, and the application of Kirkpatrick's 4-level evaluation model.

The adoption of digital technologies in Turkish education dates back to the late 1980s, with initiatives aimed at introducing ICT tools to schools. Projects like the "Primary Education" and "FATİH" have played a significant role in equipping schools with technology infrastructure and promoting digital learning environments. Yet, effective integration of digital technologies in education largely depends on teachers' competence in utilizing them. However, research suggests that many teachers lack the necessary skills and pedagogical knowledge. In-service training programs have been developed to bridge this gap, but they often lack interactive elements and assessment mechanisms to evaluate learning and behavior changes. Moreover, teachers' competence in digital technologies is affected by inadequate formal education and training. This challenge became more evident during the

COVID- 19 pandemic, which highlighted the need for teachers to adapt to remote and online learning. The rapid growth of digital learning environments further underscores the urgency of addressing this issue.

In a nutshell, the literature review section offered an overview of the historical development of digital technologies in Turkish public schools, the challenges faced by teachers in integrating them, the limitations of current in-service training programs, and the relevance of Kirkpatrick's model for evaluating training effectiveness. These insights laid the groundwork for further exploration of the impact of the Digital Teachers Project on teachers' learning, behavior, and contributions to their institutions.

CHAPTER 3

METHODOLOGY

In this chapter, the overall methodological design of the study is examined in a detailed way. The research problem and questions, design of the study, the justification of the selected method, the way the study was implemented, the criteria for choosing participants and sampling, data collection process, data analysis, the tests required for the validity and reliability of the results, and limitations of the study are covered extensively.

3.1 Research Problems and Research Questions

The main aim of the present study is to evaluate the outcomes and effects of the Digital Teachers Project (DTP) on the participating teachers' knowledge, practices, and contributions to their organizations. The findings of the study are meant to show the effectiveness of DTP and provide implications to increase the importance of teachers' undergraduate curriculum and in-service training. To achieve these humble objectives, the following key research questions were developed to guide the study:

- Research Question 1: How satisfied are the participants with the Digital Teachers Project?
- Research Question 2: To what extent did participants acquire the intended knowledge and skills in terms of digital literacy?
- Research Question 3: How did the training program impact participants' behavior at their workplace?
- Research Question 4: As a result of the training program, how did the participants contribute to the development of their schools?

In order to find comprehensive answers to these questions, around 4500 teachers taking part in different semesters of the Digital Teachers Project were sent invitation emails to ask for their participation in the study.

3.2 Design of the Study

The present study follows evaluation research methodology. Evaluation research is a form of research that concentrates on evaluating and determining the efficiency, effectiveness, and impact of trainings, programs, policies, or projects (Fraenkel et. al., 2012). Its primary objective is to offer useful insights and data that can be used to make informed decisions, improve programs, ensure accountability, and comprehend the effects and outcomes of various actions (Fraenkel et. al.,2012). More specifically, this study uses summative evaluation to determine the outcome and impacts of the Digital Teachers Project based on Kirkpatrick's (1976) Four Levels of Evaluation of Training Programs, namely (1) Reaction, (2) Learning, (3) Behavior, and (4) Results (Kirkpatrick, 1976).

3.3 Research Participants and Sampling

The current study the outcomes of the Digital Teachers Project, namely, its effects and impact on the participants' knowledge, skills, and behaviors. Broadly speaking, the target population of the research includes all the teachers in Turkey. However, considering the aim of the study, the population of the study was composed of all

teachers in the previous five semesters of the DTP, who joined the project and completed Phase I. With a completion rate of 80-90% of approximately 1000 teachers in each semester, there were a total of approximately 4000-4500 teachers that completed Phase I of DTP during the past five semesters. By utilizing purposive sampling (Fraenkel et. al, 2012), invitation emails were sent to ask for their participation to the current study. From these teachers, 226 responded to the invitation and agreed to participate to the study. Yet, during the data clean-up before the data analysis, three participants were found to fill the online survey twice, while one participant had filled the form even though he did not participate in the project but received the invitation e-mail somehow. Thus, this participant's answers were omitted and the and duplicates were removed from the database. In the end, the valid data from 222 participants were analyzed. Participants' demographics (gender and age range) are given in Figure 3.

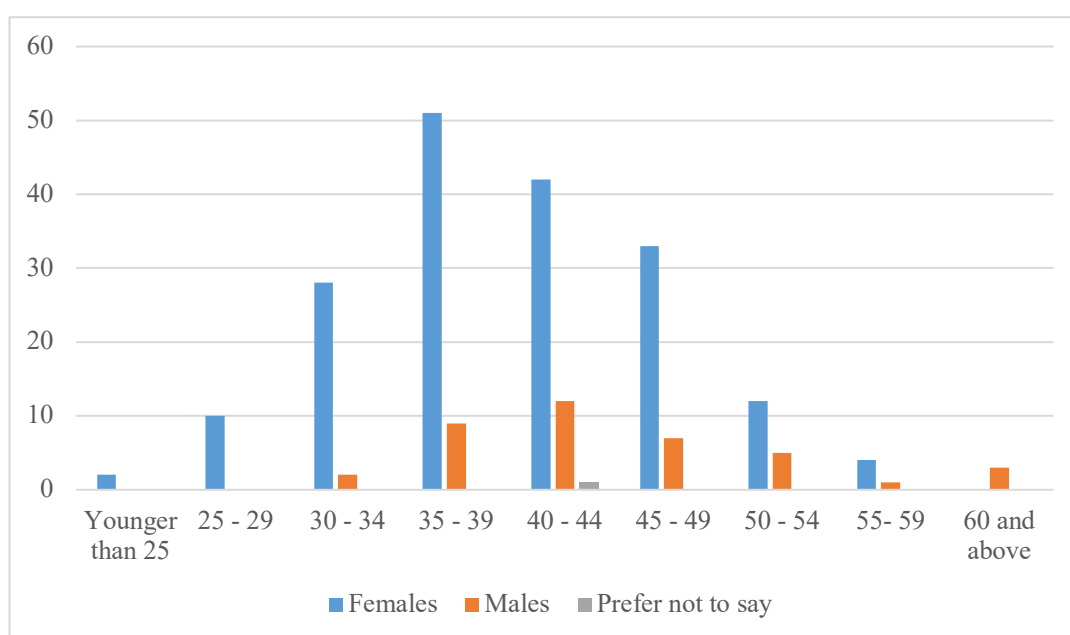


Figure 3 Age range and number of the research participants by gender

Since the DTP is designed to develop and improve the digital skills of primary and lower-secondary school teachers in Turkey, teachers from various levels and types

of schools (see Figure 4), subject matters (see Figure 5) and cities applied to the project. However, it should be noted that the teachers might work at different type of schools at different times, which explains the high school and other teachers in the data. Also, there were three research participants who reported that they were not working at regular schools. One was working at hospitals, where they teach sick children whereas two were affiliated with Science and Art Centers (“BİLSEM” in Turkish), which is a different type of school for gifted students.

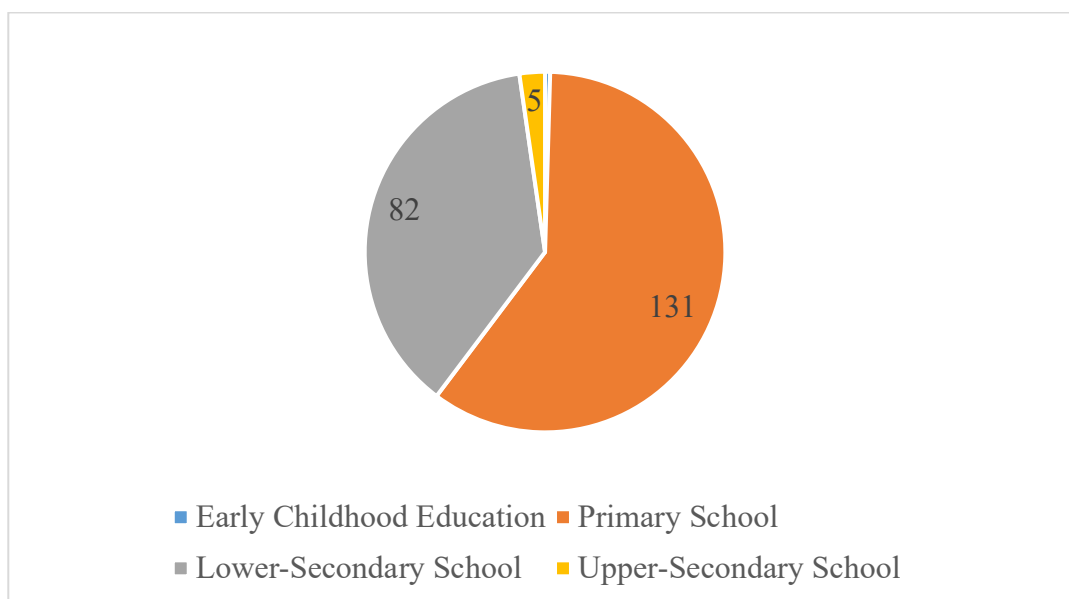


Figure 4 School types where the research participants work.

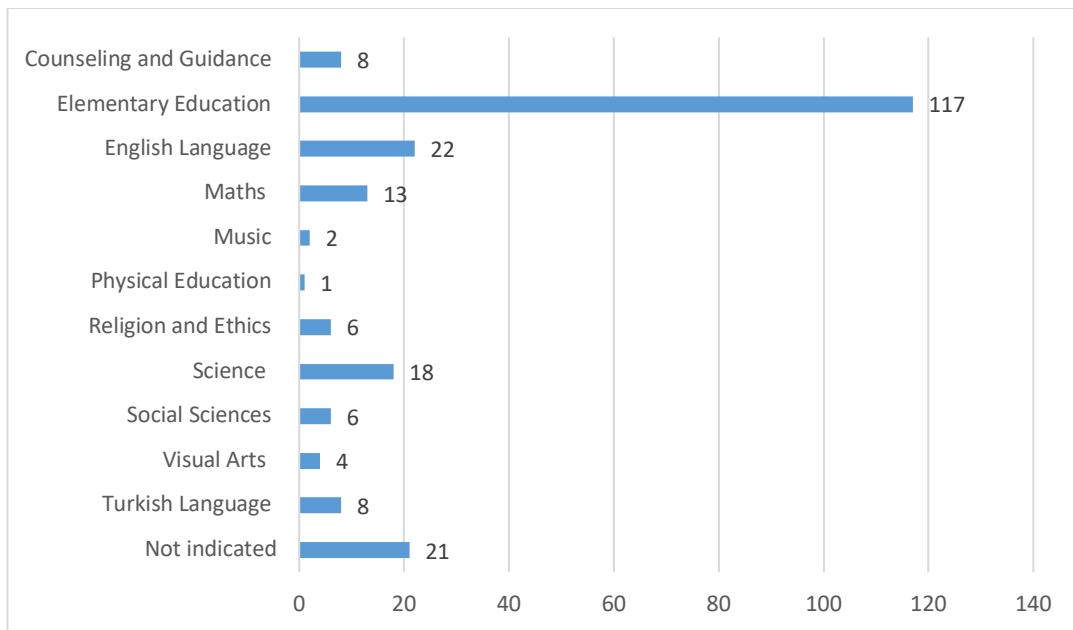


Figure 5 Distribution of the research participants according to subject matters

3.4 Role of the Researcher

In this section, I will outline my crucial role as the researcher throughout this study. My responsibilities span the entire research process, from conceptualizing the study to gathering data, analyzing it, and drawing conclusions.

Before everything else, I need to state that I am one of the trainers in the Digital Teachers Project. Being a trainer in the project for three semesters has enabled me to have a deep understanding of the project, training topics, and participant profile. Additionally, I am a full-time working teacher at one of the state schools in Turkey, just as the participants are. I have been working as a teacher for almost five years, four years at state schools and one year in private school, and I have experience of working with many teachers from more than ten different subject matters at various school levels. That's why, I can confidently state that I have the necessary experience and knowledge to understand the job conditions and jargon of the teachers.

Moreover, to ensure the research was conducted with integrity and objectivity, I adhered closely to established research methods and ethical guidelines. Data analysis involved coding qualitative data, performing statistical analyses for quantitative data, and using software to thoroughly examine the results. To enhance the study's reliability, a second researcher independently reviewed and coded a portion of the data. Ethical considerations, like obtaining informed consent and safeguarding participant confidentiality, were always a priority. My role as a researcher in this study was marked by a commitment to transparency, ethical conduct, and the rigorous application of research methods.

3.5 Data Collection

This section illustrates the data collection instruments and procedures. First of all, the ethical permission for collecting data was received from Middle East Technical University's Human Research Ethical Committee on 19 June 2023 (see Appendix A). Besides, an informed consent form was prepared for the participants to inform them about the study, and that the study does not pose any harm to their physical or psychological health. It is also made clear to them that even after they agreed to participate in the study, they had right to stop participation anytime if they felt any discomfort.

3.5.1 Instruments

There are three instruments to collect data in the current study: the reaction surveys, achievement scores, and "Digital Teachers Project's Impact Evaluation Questionnaire" ("*Dijital Öğretmenler Projesi Etki Değerlendirmesi Anketi*"), that

was prepared to answer the pursued research questions for the current study (see Appendix B).

The questionnaire consisted of both quantitative and qualitative questions, and it was divided into six sections. In the first section, the informed consent form is provided. In the second section, demographic information of the participants (name, surname and email addresses) is collected. In the third section, the quantitative questions are presented. In the fourth section, qualitative questions are given. In the fifth section, other personal and demographic information (such as city, age, gender etc.) is collected. In the last section, the participants are asked to provide feedback about the survey, if any, such as technical problems with the survey tool, spelling errors, request to communicate with the researcher etc.

Dillman (2007) provides guidelines on how to prepare and conduct internet surveys in his book “Mail and Internet Surveys: The Tailored Design Method”. Dillman (2007) showcases that following these suggestions, and adding some other considerations, increases the response rate of the study. While preparing and conducting the survey, and monitoring the data collection process, I followed these guidelines as much as possible. For example, I divided the survey into different sections to make it easier to navigate (Dillman, 2007). In the first section, I provided the informed consent form in such a design that provided the necessary information in a question-answer format to help the participants understand the study better. Addition to that, I separated the demographic questions from quantitative questions, and quantitative questions from qualitative questions to decrease the burden on the participants for focusing on and scrolling through the questions (Dillman, 2007). Moreover, for some questions that have certain but multiple answers, such as choosing the city the participants live in, which requires 81 options in our case, I used drop-down menu function to decrease the space on the screen and ordered the names in an alphabetical order for finding the suitable option easily.

3.5.1.1 Quantitative Instruments

There were different instruments for collecting quantitative data for the study. The first one is the reaction surveys that were applied to the project participants right at the end of each semester. The survey asked the participants whether the project met their expectations and whether they would recommend their colleagues to participate in the following phases of the DTP. The participants were asked to answer these two questions with "Yes/No" statements.

Secondly, the achievement scores of the project participants were collected. The scores were given for the tasks that the participants prepared during the project. The tasks were assigned to check the comprehension and learning of the participants for the applied parts of the training program. There are 3-5 tasks in each semester depending on the circumstances. The average of achievement scores that each research participant gained for the tasks was taken from the database of the project.

Lastly, the responses of the quantitative questions in Digital Teachers Project's Impact Evaluation Questionnaire were collected. The questions were taken from "the Adaption of Technology Integration Self-Efficacy Scale into Turkish" study (Ünal & Teker, 2018). The original questions of the study were developed by Wang, Ertmer and Newby (2004) to evaluate the self-efficacy of prospective teachers about technological integrations (as cited in Ünal & Teker, 2018) and it was adapted by Ünal & Teker (2018) into Turkish to be able to use it in Turkish context. The validity and reliability studies of the adaptation were made by the researchers, and it was concluded that the adapted scale was valid and reliable to be used in Turkish culture (Ünal & Teker, 2018). Since the participants of our study were all Turkish teachers, I decided to use the Turkish version of the study. I have received permission from Ünal to use his survey in my study (see Appendix C).

As the instruments should be economical in design and increase the response rates (Creswell, 2018) and the 5-level scale of opinions is a simpler and more reliable technique (Likert, 1932), each question included a 5-level scale, in which "1"

indicated “I totally disagree”; “3” referred to “Undecided”, and “5” indicated “I totally agree” statements.

3.5.1.2 Qualitative Instruments

I prepared 11 open-ended questions in the fourth part of the questionnaire. The questions were based on the content of the Digital Teachers Project courses and Kirkpatrick’s 4 levels model. The questions were aimed at collecting data for evaluating the Behavior and Results levels of the Kirkpatrick model. For example, the first question: “What kind of activities have you conducted in your class or at your school by using the skills and knowledge you acquired through the Digital Teachers Project?” aimed at finding out if the teachers had any behavioral change at their workplace. The second question: “Have your students developed different kind of projects or products by using the digital tools you have taught them?”, on the other hand, was meant to find answer for the results level of the evaluation model. It is not convenient to state all the questions at this point, yet it is quite useful to indicate that questions numbered 1 – 10 and 11 were developed to find answers for the third level (Behaviors) of the evaluation model, while the questions numbered from 2 through 9 were aimed at finding answers for the last level (Results) of the model. Also, some questions were complementing or similar to each other. A visual showing how the research questions and the open-ended questions are related, and the relation among the open-ended is provided in figure 6.

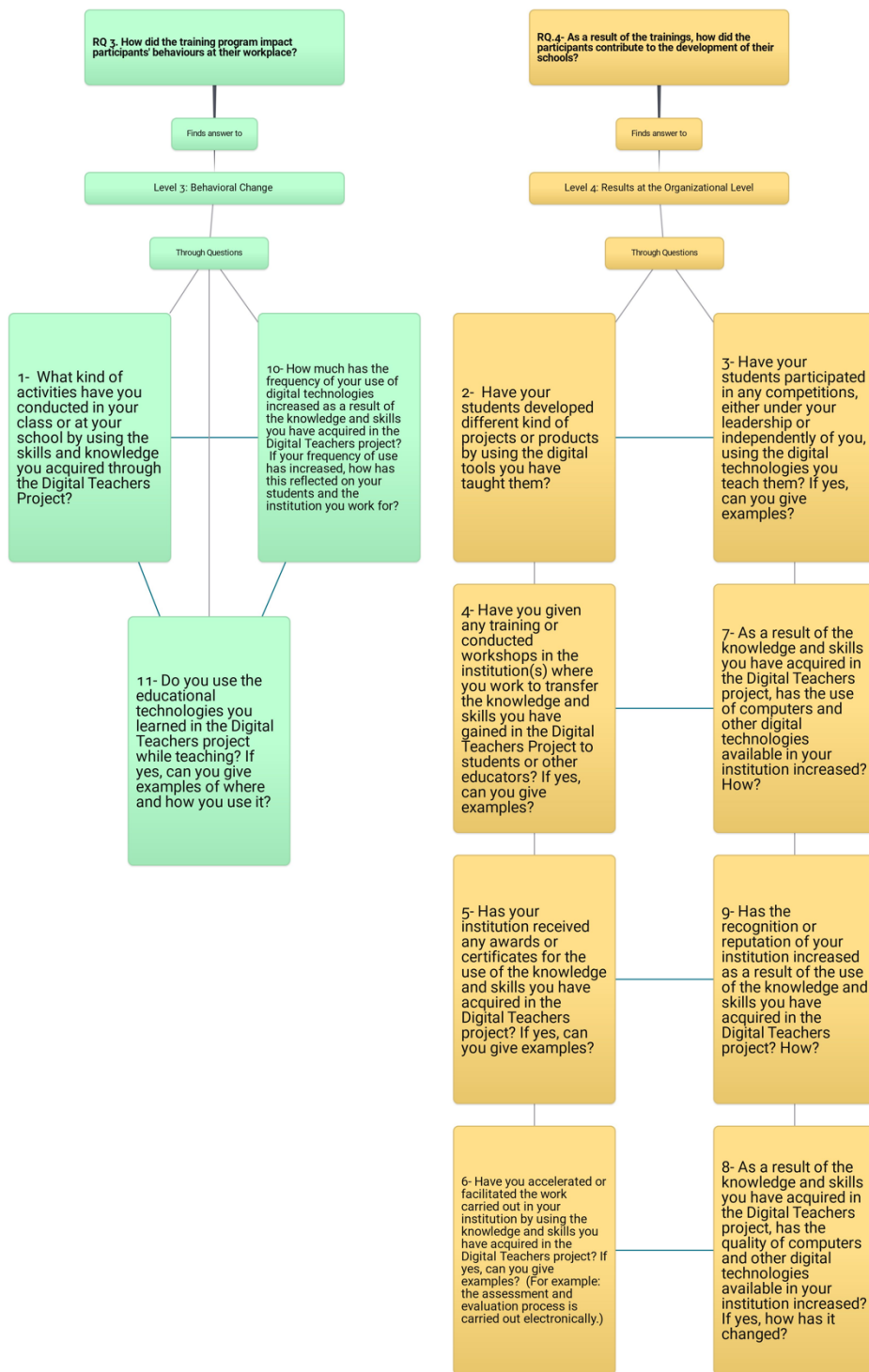


Figure 6 Relations among survey questions and research questions

3.5.2 Data Collection Procedures

The data for the reaction surveys and the achievement scores were already collected and stored in the project coordinator's computer. The coordinator provided me with the whole data of the project participants. As the demographic information of the research participants were collected in the questionnaire, I was able to extract the data of 222 research participants from the whole data provided by the coordinator.

To begin collecting data for the Digital Teachers Project's Impact Evaluation Questionnaire, the teachers participating in the first five phases of the Digital Teachers Project were sent e-mails to the mail addresses provided while applying to the project. To decrease the mail traffic on our systems and prevent our e-mail accounts from being labelled as "spam account", I divided the participants into groups and sent emails to only one group each day. The information of the teachers and sent e-mails were kept on an electronic spreadsheet, namely MS Office Excel, to keep the record of the mail traffic and responses. The administration process followed the guidelines suggested by Dillman (2007). Dillman proposes a five-stage administration process for sending and collecting surveys online. The first four contacts – which are an advance notice e-mail, actual questionnaire e-mail, and two reminder e-mails for showing gratitude and encouraging for the response in a short time – are online invitations and the last one includes a "special" phone call or delivery mail for the recipient (Dillman, 2007). The model seemed to provide a better response rate and less discomfort on the participants. That's why, I used Dillman's model in my study. However, as my resources were limited, I was able to apply only the first 4 steps of the model.

The actual invitation e-mail (see Appendix D) included clickable web address to allow the participants access the survey. The data collection process started after the big earthquake that happened in Turkey on February 06, 2023 and turned into a disaster by destroying ten cities and killing more than 50 thousand people. As some of the participants of the project lived in the affected cities, I started the e-mail with my condolences.

The reminder e-mails (see Appendix E) also included the clickable web address to access the survey and informed the participants that they received the e-mail as a result of not answering the questionnaire after the invitation e-mail. 84 participants responded to the questionnaire after one week of sending the actual invitation e-mail. The first reminder was sent after one week of sending the invitation e-mail and 21 more participants responded to the questionnaire after the first reminder e-mail.

The second reminder e-mail was sent upon waiting for responses for one week after the previous reminder and 49 more participants responded to the questionnaire after the second reminder.

The last reminder e-mail was sent upon waiting for responses for two weeks after the second reminder and 72 more participants responded to the questionnaire after the last reminder.

3.6 Data Analysis

In this section of the study, the data analysis procedures for both quantitative and qualitative data are provided extensively. The qualitative and quantitative data were analyzed separately as they aimed at finding answer for different levels of the Kirkpatrick Evaluation Model. In total, 226 participants filled the online questionnaire. However, while preparing the data for the analysis, I realized that three participants had filled the form twice and one participant stated that he had filled the form even though he did not participate in the project but received the invitation e-mail somehow. Thus, I deleted that participant and duplicates from the database. At the end, the valid data from 222 participants were analyzed. To ensure the anonymity, the participants were enumerated as T-1, T-2, T-3 ..., referring to the participants Teacher 1, 2, 3... .

3.6.1 Quantitative Data Analysis

The quantitative data collected from the participants included the reaction survey responses, achievement scores and the quantitative questions in the questionnaire. These questions aimed mainly to find answers to first and second research question. The raw data were transferred to IBM's SPSS Statistics Version 28.0.0.0 Package for MacOS for the statistical analysis. The software was used to analyze and visualize the data of the study. The questionnaire was conducted in Turkish language, but it was translated into English before entering the data into SPSS.

The first question, "How satisfied are the participants with the Digital Teachers Project?" refers to the first level of Kirkpatrick's Evaluation Model, which shows whether the participants were satisfied with the training conducted (Kirkpatrick, 1976). Frequency of reaction survey answers were used to report the result of these data.

The second question, "To what extent did participants acquire the intended knowledge and skills in terms of digital literacy?", refers to the second stage of Kirkpatrick's Evaluation Model, that deals with the degree to which the participants acquire the intended knowledge and skills (Kirkpatrick, 1976). The mean and frequency of the achievement scores and responses to the quantitative questions were used to analyze and interpret the results.

3.6.2 Qualitative Data Analysis

The qualitative questions in the survey aimed to find answer to the third and fourth research questions. They were designed in accordance with the third and fourth stage of Kirkpatrick's Evaluation Model, which indicates the contributions to the participants' behaviors and organizations as a result of the training program (Kirkpatrick & Kirkpatrick, 1976). The raw data were acquired from open-ended

questions. The analysis of the data was conducted according to Creswell (2018)'s steps for organizing and analyzing qualitative data. Firstly, I organized and prepared the data for the analysis. Secondly, I read through all the data and coded them afterwards. Next, I interrelated the codes and interpreted them as a last step of thematic analysis. A visual adapted from Creswell (2018) for showing the qualitative data analysis steps in my study is provided in Figure 7.

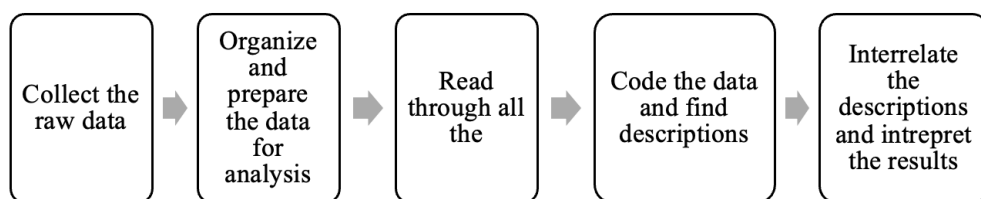


Figure 7 Qualitative Data Analysis Process

The inductive thematic analysis was predominantly utilized to analyze the data. However, at certain points, I employed deductive techniques to categorize and arrange the data as well.

I used MAXQDA 2022 Software for MacOS for the analysis of the qualitative data. I started with coding the answers of the participants for each question. At the end of this process, there were a total of more than 250 codes for 11 questions. I worked on the codes to find related ones and categorize them for each question. After the categorization, there were a total of 39 codes. Later, I continued working on these 39 codes to find the themes and report the results.

3.7 Quality of the Research

Validity and reliability issues are essential to research studies for the quality of the instruments, accuracy, and trustworthiness of the results of the study (Fraenkel et.

al., 2012). Validity is the appropriateness of the instruments and results while the reliability is the consistency of the scores (Fraenkel et. al., 2012). In other words, validity shows whether the instruments could measure the intended research questions, and reliability proves that the research can be conducted by another independent researcher and provide similar results each time.

Before explaining the validity and reliability of test instruments and the results, I would like state that I assumed that the participants were honest while filling the survey form.

3.7.1 Validity and Reliability of Quantitative Questions

Some of the threats to internal validity of the study are explained by Fraenkel et. al. (2012) and Creswell (2012). Firstly, as the characteristics and background knowledge of the participants may differ to a great extent, it may cause a threat to the internal validity of the study. While the participants applied to the Digital Teachers Project, they were asked to provide some information about their background in the application form. The form included questions such as their acquaintance and experience with the topics that are taught during the project, self-evaluation about their knowledge of digital technologies, and the digital materials they prepared previously. While choosing the participants for the project, the DTP team made sure that the participants were at a similar level, and had no or very little knowledge and experience on the topics of the training. The participant selection criteria of the project assumes that the subject characteristics are not a threat to the internal validity.

Secondly, the administration process of the instruments is another threat to the validity of the results (Fraenkel et. al., 2012). The questionnaire used in the current study was applied in the form of an online survey to each and every participant. The online survey was delivered through a cloud-based form that could be accessed

through internet browsers and it did not require any specific software or high-tech device on the participant's side. Besides, I added a last section to the questionnaire to let the participants inform me if they had any technical or compatibility problems with filling the form so that I could find another way of reaching them. None of the participants provided feedback for this issue. In short, all the participants went through the same administration process and similar experience with filling the form, which made sure that the instrumentation was not a threat to internal validity of my study.

As for the inter-rater reliability of the achievement scores, the tasks of the teachers were evaluated based on the specific rubrics and the DTP trainers were strictly adhered to it while grading them. Addition to that, the quantitative questions in the questionnaire were based on self-evaluation of the participants and I did not have any effect on the participants' answers, either. Thus, I believe that there were no threats to the inter-rater reliability of the scores.

3.7.2 Validity and Reliability of Qualitative Questions

This is a good point to emphasize that the validity and the reliability in qualitative research is mostly referred as the credibility of the study (Fraenkel et. al., 2012). Thus, it should be noted that when I say the credibility of the qualitative part, I refer to the validity and reliability issues.

The present study is more of a descriptive study so internal validity may not have as much importance as it would have in experimental research (Creswell, 2018; Fraenkel et. al., 2012). However, the researcher bias are still important threats to the validity of the study (Fraenkel et. al., 2012). To eliminate the researcher bias and increase the credibility in the present study, I followed some suggestions provided by Fraenkel et. al. (2012), and Creswell (2018). Firstly, I used member checking to ensure that the findings of the qualitative data made sense to the participants of the

study. I randomly selected four research participants from the study, who stated that “I want to be communicated about the purpose and the results of the current study”, and I communicated with them to schedule an online meeting. During the meeting, I informed them about what I have done and presented the major findings of the study. All of the four participants stated that the findings were consistent with their experiences and the answers they provided in the survey.

Secondly, Creswell (2018) emphasizes that the researcher should spend a lengthened time in the field of study to have a comprehensive understanding of the topic studied and the participants. Similarly, Fraenkel et. al. (2012) describes the same issue as speaking the jargon of the participants. As mentioned in the role of the researcher section, I am one of the full-time working teachers at state school and one of the trainers at the Digital Teachers Project. Putting together these two situations, I have much knowledge of the context the teachers work in and the language they speak among themselves. That’s why, I had no problem with understanding the jargon of the research participants and interpreting their responses.

Lastly, as the findings of qualitative data is mostly based on the researcher’s ethical and logical interpretations, I asked an “external auditor” (Fraenkel et. al., 2012) to check the interpretation of the raw data and the results of the study based on the qualitative data. The external auditor is an associate professor working at the education faculty of one of the most reputable universities and has years of experience in conducting qualitative research in education. After the auditor was informed about the study and the Digital Teachers Project, she was asked to go through some of the qualitative data and check the themes decided upon this data. The auditor and I had a meeting and discussed about the raw data and the themes. We mostly agreed upon the findings and the decided themes. A few minor disagreements were resolved after we expressed our rationale for the points in question.

3.8 Limitations and Delimitations

The first delimitation in our study may stem from the sampling method, purposive sampling. Although, simple random sampling method might be more reliable and provide a better perspective for the research questions, the purposive sampling is mostly more convenient and fits best to the present research case. Secondly, as previously stated, I assumed that the participants were honest while filling the questionnaire form. That's why, the results and conclusions in the current study are based on those answers provided. Apart from that, the results are only limited to the time the data was collected and the answers of the participants that were specified previously. A similar or equal study with different groups or even with the same group at a different time would probably not provide exactly the same results as the present study did because the participants' characteristics and maturation will have impact on the data. Lastly, the generalizations and the conclusions made in the current study are only limited to my knowledge and skills although I did the best I could do to make sure that the conclusions had a scientific basis with the light of resources available.

CHAPTER 4

RESULTS

This chapter of the thesis presents the outcomes of the research. The objective of this section is to offer a concise and clear overview of the study's results, addressing each research question individually. The qualitative and quantitative data outcomes will be presented in separate sections, with the intention of enhancing the comprehensibility of the results and facilitating subsequent discussions and interpretations. By presenting the outcomes of these two types of data separately, my intention is to assist the reader in grasping the merits and limitations of each data type and how they can mutually supplement one another.

This is also a good point to remind the research questions to the readers:

- Research Question 1: How satisfied are the participants with the Digital Teachers Project?
- Research Question 2: To what extent did participants acquire the intended knowledge and skills in terms of digital literacy?
- Research Question 3: How did the training program impact participants' behavior at their workplace?
- Research Question 4: As a result of the training program, how did the participants contribute to the development of their schools?

4.1 Results of the Quantitative Instruments

As mentioned in the method chapter, the quantitative data in our study included the (1) reaction surveys conducted at the end of the project, (2) achievement scores obtained during the project, and (3) the quantitative questions in our questionnaire.

These instruments were aimed at finding answers for the effectiveness of the DTP according to the first two levels of Kirkpatrick model.

4.1.1 Results of the Reaction Surveys

The reaction surveys were conducted at the end of the last synchronous session of each phase of the DTP. The trainers provided the participants with the survey link and kindly asked them to fulfill the form. The survey was not compulsory that's why not all of the participants agreed to complete the survey. The data were stored on the project coordinator's Google Drive account and were provided to the researcher for the analysis. I acquired the valid data of 662 participants for the first five phases of the project. After cross-checking the participants of the reaction survey and the participants of the questionnaire prepared for this thesis, I found out that around 14% (n=32) of the 222 participants had also filled the reaction survey during the project. Both of the questions in the survey indicated whether the teachers were satisfied by the project. If the teachers selected "Yes" as an answer to either of the questions, it would mean that the project was successful in fulfilling the expectations of the teachers and satisfy their needs. The results of first question (table 1) and second question (table 2) are provided below. As it can be seen from the tables, more than 98% of the participants indicated that the project satisfied their expectations and almost all the participants (n=660) would recommend the project to their colleagues.

Table 1 Expectations Result

Has the DTP met your expectations?

		Frequency	Percent	Valid Percent
Valid	No	8	1.2	1.2
	Yes	654	98.8	98.8
	Total	662	100.0	100.0

Table 2 Recommendation Results

		Frequency	Percent	Valid Percent
Valid	No	2	.3	.3
	Yes	660	99.7	99.7
	Total	662	100.0	100.0

4.1.2 Results of the Quantitative Questions in the Questionnaire

The quantitative questions in the questionnaire were designed to guide the participants to evaluate their learning and practices after they participated in the Digital Teachers Project. The questions were chosen in line with the outcomes of the modules and training program of the project. The participants were asked to self-evaluate themselves on a five-point scale, where:

- “1” meant “strongly disagree”,
- “2” meant “disagree”,
- “3” meant “undecided”,
- “4” meant “agree”,
- “5” meant “strongly agree” with the statement given.

Table 3 shows that the participants reported that they felt highly competent in the specified statements as the mean score for each statement was higher than 4. The data suggests that the teachers acquired the topics and felt capable of using the knowledge for their teaching practices.

Table 3 Results of the Quantitative Questions

	Valid N	Frequencies of answers					Descriptive Statistics	
		1	2	3	4	5	Mean	Std. Deviation
1- I feel confident that I have the skills necessary to use the computer for instruction.	222	0	2	14	98	108	4.41	.650
2- I feel confident that I can successfully teach relevant subject content with appropriate use of technology.	222	0	2	9	99	111	4.43	.640
3- I feel confident that I can help students when they have difficulty with the computer.	222	0	2	26	98	96	4.30	.707
4- I feel confident that I can motivate my students to participate in technology-based projects.	222	1	2	18	87	114	4.40	.716
5- I feel confident that I can mentor students in appropriate uses of technology.	222	0	2	9	109	102	4.40	.614
6- I feel confident that I can consistently use educational technology in effective ways.	222	0	2	16	98	106	4.39	.661
7- I feel confident that I can provide individual feedback to students during technology use.	222	0	2	17	91	112	4.41	.672
8- I feel confident that I can regularly incorporate technology into my lessons, when appropriate to student learning.	222	0	2	9	86	125	4.50	.622

Table 3 (continued)

9- I feel confident about selecting appropriate technology for instruction based on curriculum standards.	222	0	3	10	102	107	4.41	.644
10- I feel confident about assigning and grading technology-based projects.	222	1	5	37	98	81	4.14	.803
11- I feel confident about using technology resources (such as spreadsheets, electronic portfolios, etc.) to collect and analyze data from student tests and products to improve instructional practices.	222	2	10	50	78	82	4.03	.927
12 - I feel confident that I will be comfortable using technology in my teaching.	222	1	2	18	90	111	4.39	.714
13 - I feel confident that I can develop creative ways to cope with system constraints (such as budget cuts on technology facilities) and continue to teach effectively with technology.	222	1	7	52	88	74	4.02	.859

Looking at the data and the results in a holistic table is best fit to avoid distracting the readers and providing a summary of the statements. Yet, I believe that it is not sufficient enough to interpret the statements and relate them to the DTP. Besides, as can be seen from the statements, some of them are related to or complementing each other. That's why, it is better to categorize the related statements and report the results with the commonalities. To start with, a few of the statements (numbered as 1, 2, 6, 8, 9 and 12) are gathered around "confidence and competence in integrating technology in teaching" heading. The statements emphasize the teachers' ability to use technology appropriately and effectively to enhance their instructional methods, subject content delivery, and student learning experiences. Also, they reflect an aspect of confidence, indicating the competence of teachers' usage and integrating

technology in their teaching context. The need for consistent and regular integration of technology is highlighted in several statements, as well. Lastly, selecting appropriate technology tools and resources based on curriculum standards is emphasized in the statements. Overall, the teachers stated that they were successful in smoothly incorporating technology into their teaching practices. For each and every statement, at least 200 participants (more than 90% of the sample group) indicated that they either “agreed” or “strongly agreed” with the given statement. The results can be seen in table 4.

Table 4 Confidence and Competence in Integrating Technology in Teaching

	Valid N	Frequencies of answers					Descriptive Statistics	
		1	2	3	4	5	Mean	Std. Deviation
1- I feel confident that I have the skills necessary to use the computer for instruction.	222	0	2	14	98	108	4.41	.650
2- I feel confident that I can successfully teach relevant subject content with appropriate use of technology.	222	0	2	9	99	111	4.43	.640
6- I feel confident that I can consistently use educational technology in effective ways.	222	0	2	16	98	106	4.39	.661
8- I feel confident that I can regularly incorporate technology into my lessons, when appropriate to student learning.	222	0	2	9	86	125	4.50	.622
9- I feel confident about selecting appropriate technology for instruction based on curriculum standards.	222	0	3	10	102	107	4.41	.644
12 - I feel confident that I will be comfortable using technology in my teaching.	222	1	2	18	90	111	4.39	.714

Secondly, a few of the statements (numbered as 3, 5, 7, and 13) are gathered around “teachers’ confidence in supporting students’ technology use” heading. These statements all revolve around how teachers feel about helping students with technology usage and constraints. They show whether the teachers are confident in their ability to assist students when they face difficulties with technology, or give individual feedback when the students need. And even when things get tough, like budget cuts for the facilities, teachers feel they can come up with creative ways to keep teaching effectively with technology. The results can be examined in Table 5.

Table 5 Teachers’ confidence in supporting students’ technology use.

	Valid N	Frequencies of answers					Descriptive Statistics	
		1	2	3	4	5	Mean	Std. Deviation
3- I feel confident that I can help students when they have difficulty with the computer.	222	0	2	26	98	96	4.30	.707
5- I feel confident that I can mentor students in appropriate uses of technology.	222	0	2	9	109	102	4.40	.614
13 - I feel confident that I can develop creative ways to cope with system constraints (such as budget cuts on technology facilities) and continue to teach effectively with technology.	222	1	7	52	88	74	4.02	.859

Lastly, a few of the statements (numbered as 4, 10, and 11) are gathered around “teachers’ confidence in leveraging technology for student engagement and assessment” heading. The first two statements highlight the teachers’ ability to

motivate students to actively participate in technology-based projects and assigning and grading technology-based tasks. The last one emphasizes teachers' ability of using technological resources to gather and analyze data from student assessments and products. These statements all narrow down to teachers feeling competent about using technology to engage students and assess their learning. They believe they can get students excited about projects that involve technology, and they are confident in assigning and grading those projects. They are also sure about using technological tools to analyze data from tests and student work, which helps them improve how they teach. The results can be examined in table 6.

Table 6 Teachers' confidence in leveraging technology for student engagement and assessment.

	Valid N	Frequencies of answers					Descriptive Statistics	
		1	2	3	4	5	Mean	Std. Deviation
4- I feel confident that I can motivate my students to participate in technology-based projects.	222	1	2	18	87	114	4.40	.716
10- I feel confident about assigning and grading technology-based projects.	222	1	5	37	98	81	4.14	.803
11- I feel confident about using technology resources (such as spreadsheets, electronic portfolios, etc.) to collect and analyze data from student tests and products to improve instructional practices.	222	2	10	50	78	82	4.03	.927

However, I thought that the self-evaluation of the teachers may not be a highly credible indicator of their success and learning. That's why, I used the scores they

obtained from the tasks to compare the results to make more reliable and valid interpretations about their learning. The results of these scores are given in the following section.

4.1.3 Results of the Achievement Scores

The tasks were assigned to the teachers during the whole phase of the project. There were between 3 to 5 tasks in each semester of the project depending on the limitations of the phase. The mean of the scores of all the tasks that each participant prepared were calculated and it was named as “average grade obtained from the tasks”. The tasks were among the requirements to finish the project successfully. However, some teachers (n=8) did not complete any of the tasks and some completed only 1-2 tasks. During the project, these teachers had informed the trainers that they were not able to complete the tasks because of several reasons such as losing a family member during the project, having insufficient time, workload at school, health issues etc. Yet, they still attended the synchronous classes and completed the training, and neither of them reported dropout from the project. These participants obtained zero point and it was still included in the analysis process. The data were stored on the project coordinator’s Google Drive account and were provided to the researcher for the analysis. I acquired the data of all the participants for the first five phases of the project and selected the data of 222 participants who filled the questionnaire prepared for this thesis. The grades of only those participants were used for analysis. As can be seen from figure 8, the mean score of the participants was 85.57 (SD = 24.2). Although the mode of the scores was “100” points and most of the grades were accumulated above the mean score, the obtained zero scores increased the standard deviation rate of the scores to a great extent.

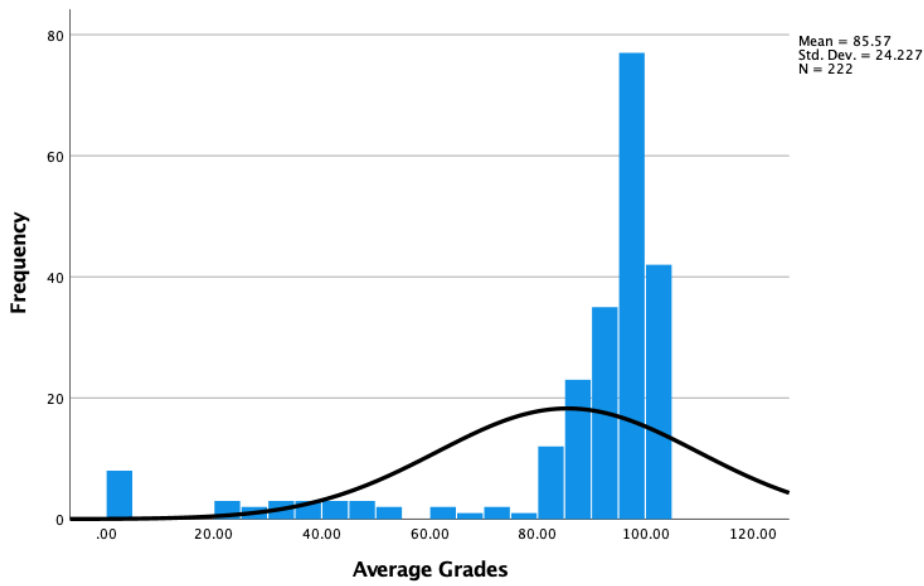


Figure 8 Average achievement grades taken from the tasks

As a rule of thumb, the learners who get 50-60 points out of a 100 hundred points-exam are accepted as successful learners at most universities or schools. Addition to that, the participants in the DTP are accepted as successful completers if they receive a c-GPA of 70 points out of 100. That’s why, I decided to add a few points to this criterion and set the minimum success grade to 75 out of 100. In other words, I assumed that the research participants whose average grade were equal or above 75 to be successful learners, and they were accepted to have acquired most of the outcomes of the training. The scores of the participants were categorized using the SPSS software and the analysis was conducted. The results of this analysis and assumption are provided in Table 7.

Table 7 Grades above and below 75 points

	Frequency	Percent	Valid Percent
Valid Below 75 points	32	14.4	14.4
Between 75 and 100 points	190	85.6	85.6
Total	222	100.0	100.0

According to the results and the assumption, around 85% (N=190) of the participants were successful according to their scores on the tasks they prepared.

4.2 Results of the Qualitative Instruments

The thematic analysis framework was employed to analyze the qualitative data and the findings are reported in this part of the thesis.

The purpose of the qualitative questions was to find answers to the third and fourth research questions. They provided the chance of in-depth and broader exploration of the participants' motivations, actions, and results of the training program at different levels.

The items numbered as 1 – 10 and 11 in the open-ended questions part of the questionnaire were meant to find answers to the third level of the Kirkpatrick Model while the rest of the questions were aimed at finding answers to the fourth level of the model. Besides, some of the questions were related or complementing each other. Thus, the themes were also found to be related, which helped me categorize them more easily. The thematization process were based on the two research questions. The common themes were unified and reported together to help the readers grasp the ideas more easily. The results are given in the next parts in two sections as there were two research questions based on the qualitative data.

4.2.1 Themes for the Behavioral Changes

One of the fundamental indicators of learning is the changes in the learner's behaviors. If the learner shows a positive behavioral change or performance increase after attending a training program, it can be assumed that the learner acquired part or all of the knowledge. Almost all the research participants stated that they either applied or transferred their knowledge they acquired from the DTP to their personal life and/or work life. Thematic analysis showed four main categories for the behaviors of the research participants. The results are given under these categories with a few references to the research participants' data. It should be noted that while references are given, the identity of the research participants are kept anonymous and they are assigned with a code starting with "T", which is used as an acronym for "teacher" and followed by a number indicating the row number of the participant in the researcher's data spreadsheet.

4.2.1.1 Mastering the Usage of Web 2.0 Tools

Most of the participants expressed that their knowledge of using various Web 2.0 tools increased tremendously after they attended the DTP. T-48 is one of the participants who expressed this change by stating that "*Dijital Öğretmenlerden önce Web 2.0 araçlarını hiç kullanmıyor daha doğrusu beceremem diye kullanmaktan korkuyordum. Şu an hemen hemen hepsini sık sık kullanıyor, içerikler hazırlayabiliyorum...* [I never used Web 2.0 tools before the Digital Teachers project, in fact, I was scared to use them because I thought I would fail. Now, I use almost all of them frequently and prepare contents with them...]".

While participants like T-48 expressed their first use of the tools, there were also many participants who were familiar with some of the Web 2.0 tools before the DTP. For example, T-117 stated that rather than the frequency, her quality of using the digital technologies has increased, and she is able to create the classroom materials

in a quite shorter time after joining the project. Acquiring the knowledge and skills to use the tools, as expressed by most of the participants, was a good indicator of learning. However, it still does not show (at this point) if the participants' behavior has changed. In other words, I needed to analyze the data to see whether the participants applied their knowledge and skills to their work life. I found out that most of the participants has used their knowledge and skills to integrate or apply the tools in their teaching activities. Besides, the tools were not limited to those covered in the DTP. The participants also mastered in finding new tools according to their needs. They felt motivated to discover and learn other available tools thanks to the guidance of the DTP trainers and their own curiosity that was flared up after they attended the project. One of the participants, T-36 said: “*Projeden sonra dijital materyal ađım daha da geniřledi. ok gzel eđitim siteleri keřfettim. Derslerimi daha eđlenceli hale getirmeye odaklandım...* [My portfolio of digital materials has expanded after the DTP project. I discovered very useful educational websites. I focused on making my classes more fun...]”.

The tools and the usage reasons differed to a great extent according to the answers of the participants. Many of them used the design tools such as Canva, Padlet, Google Presentations etc. while some of them used Powtoon, Invideo, Clipchamp etc. to create and edit videos for educational purposes. Addition to that, there were quite a few participants stating that they have been using Google forms, Kahoot, Quizizz etc. for testing and evaluation of the learning outcomes. Lastly, many participants expressed that they used various Web 2.0 tools such as Bitmoji, Wordwall, Wordart, Pexels, Shutterstock etc. to search and find instructional materials and use them in their classrooms.

4.2.1.2 Conducting Seminars and Offering Guidance on Web 2.0 Tools and Digital Citizenship

Mastering and using the tools for educational purposes was not the only finding of the first item in the questionnaire as it was more of a general question asking their activities at the workplace. The participants also expressed that they conducted seminars or provided guidance to different groups at multiple occasions. The groups included students, their parents and the colleagues of the teachers. The topics of the training were similar to those in the Digital Teachers Project. They included digital security, digital citizenship, how to use specific Web 2.0 tools, how to integrate educational technologies into classroom, how to use smart boards and computers more effectively for teaching activities etc. depending on the target group and their needs. One of the participants (T-201) has summarized her activities in a comprehensive and concise way:

... özellikle de pandemi döneminde öğrencilerimin tamamı mail açmak ve kullanmak, Canva'da sunu, poster vb. hazırlamak, dijital vatandaşlık ve güvenlik, fotoğraf ve video tasarımı, sunum hazırlarken dikkat edilmesi gerekenler gibi konuların detaylarını çok iyi öğrendiler. Mail göndermek ve Drive kullanmak da cabası diyebilirim. Bunu yaklaşık 140 öğrenci ile yapabilme fırsatım oldu. Yas, aralığı 2.sınıf ile 4.sınıf arasında idi öğrencilerimin. Projenin 2.fazına kalınca öğrendiğim CoSpaces Programı sayesinde bu kez de bu programı öğrencilerimle paylaşma fırsatım oldu. Bu hepsini çok heyecanlandırdı. Birden çok mail adresi ile her öğrencim için birer sayfa açabildim. Grubun %80'i diyebilirim sayfada vakit geçirdi, dijital bir mekân tasarlamaya çalıştı... [... all of my students comprehensively learnt how to open and use mail accounts, creating presentations, posters etc. on Canva, digital citizenship and security, photo and video creation, key points of creating presentations especially during the Covid-19 pandemic lockdowns. Sending e-mails and using Google Drive can be added to that list. I was able to do all this work with around 140 students. My students were

studying at 2nd to 4th grade. After I got the privilege to participate in the second stage of the project, I had chance to transfer my knowledge of CoSpaces tools to my students. They were all very excited. I was able to create accounts for all of my students by using multiple e-mail addresses. Around 80% of the group spent time with the tool to attempt creating digital worlds ...].

Some of the participants stated that they did not have opportunities to provide seminars, but they tried an indirect way to transfer their learning to the students and the colleagues. For example, T-192 indicated that her students watched the asynchronous classes of the DTP as well.

The provided seminars and guidance mentioned above can be argued to be categorized under the “Results” level of the Kirkpatrick Model, and in fact I did it, but I did not look for the outcomes or benefits of the seminars at this point. I focused only on the behavioral changes of the participants at their schools. That’s why, they are included in this part of the study.

4.2.1.3 Ease of Workload Management

A few of the participants indicated that they were able to facilitate or catalyze their works thanks to the technological tools they learnt. They included personal works such as improving their digital security, increasing digital health and well-being, enhancing digital literacy, managing daily tasks, communicating more effectively on the internet etc. Addition to that, they included professional works such as preparing digital contents, digitalizing paperwork, using online tools for fulfilling the daily tasks, digital security of school systems etc.

4.2.1.4 Participating in and Skillfully Coordinating Various Projects

Another pattern that I found out was that almost one third of the research participants either took part in various projects or competitions by using the tools they learnt from the DTP. They included the national and international programs such as TUBITAK 4006-4007 Science Fairs, Teknofest, E-twinning, Erasmus+ Projects etc. They either wrote a project on a topic directly related to digital technologies and digital citizenship, or they used the Web 2.0 tools for creating project materials, posters, logos, videos, photo collages, presentations, reports etc. for the project.

4.2.2 Themes for the Results at the Organizational Level

I present the results of the thematic analysis under three main categories with a few sub-categories: benefits (1) for the students, (2) for the colleagues, and (3) for the institutions. However, the readers should be aware of the fact that if the teachers contribute to the development of the students and the colleagues, they are also indirectly contributing to the development of their organizations provided that these developments make a difference at the organizations or provide benefits.

The results are given under above mentioned three categories with a few references to the participants' data. Again, it should be noted that while references are given, the identity of the participants are kept anonymous and they are assigned with a code starting with "T", which is used as an acronym for "teacher" and followed by a number indicating the row number of the participant in the researcher's data spreadsheet.

4.2.2.1 Benefits for the Students

The participants of the study frequently mentioned that they transferred their knowledge of the Web 2.0 tools, digital security, and digital citizenship to their students. The students used this knowledge to (1) create digital contents and materials, (2) increase their digital security, (3) participate in various competitions, (4) design and produce robots or game codes, and they (5) felt more motivated to learn and attend curricular activities. For example, T-117 stated that after she trained her students, they revised their computer settings such as microphone and video permissions and location sharing to have a better digital security. Another participant, T-157, stated that *“Kesinlikle evet. Bu yıl çocuklarla bir sürü proje yaptık. Yaptığımız e-Twinning projesi ile birçok farklı Web 2.0 aracı kullanarak ortak kitap yazma, şarkı, şiir, yap-boz oyunu... bir sürü etkinlik yaptık. [Absolutely yes. We have conducted many projects with my students this year. For the E-twinning project we conducted, we collaboratively wrote a book, song or poem, and created a puzzle game etc. by using various Web 2.0 tools.]”*

To emphasize the effect of the DTP on his students and the products that they prepared, one of the research participants, T-221, stated that *“Önceleri benden öğrendikleri çizgi film yapma becerilerini birbirlerine şaka yapmak için kullanıyorlardı. Bu şakalaşanlardan iki tanesi bilgisayar oyunu yazmaya başladı. Buna evirilen yolu dijital öğretmenler projesinin açtığına inanıyorum... [My students used to prepare cartoon videos, that I taught them how to create, to make fun of each other. Two of those students started to write computer game codes. I am of the opinion that the Digital Teachers Project has opened the road that evolved into this journey...]”*.

The above-mentioned benefits were frequently reported in the participants' answers to the questionnaire. However, as it was a type of self-report, I wanted to make sure that the benefits existed in a good quality. I asked some of the research participants to provide me with the products of their students. A few of them delivered examples from their student works, which made it clear that the transfer of learning from the

teachers to the students has been quite successful as the products were prepared in high qualities. Besides, for some of the teachers who reported that they participated in various projects, I checked the website and social media accounts of their schools to see whether they shared their activities online. I came to conclusion that the projects were conducted in a successful and enjoyable way.

The knowledge of the digital technologies that the students acquired from the research participants and the products or activities they performed thanks to this knowledge, increased their schools' educational quality, digital safety, and reputation.

4.2.2.2 Benefits for the Colleagues

The students were not the only ones who received benefits from the knowledge and skills of the research participants. The colleagues of the participants also had some benefits thanks to the knowledge and skills acquired through the DTP. The participants frequently mentioned that they transferred their knowledge of the Web 2.0 tools, digital security, and digital citizenship to their colleagues who either worked at their schools or at different schools in their cities. Firstly, there were quite a few of the participants who gave trainings or conducted workshops to train their co-workers on the usage of Web 2.0 Tools, and on digital literacy and security. The colleagues who were transferred with the knowledge also contributed to the development of their students or their organizations. To exemplify this, T-24 stated that " ... *Farklı okullarda çalışan öğretmen arkadaşlarımı bilgilendirdim. Şimdi öğrencileriyle birlikte dijital bir kitaplık oluşturdular. Okullarında Kahoot kullanarak öğrencilerinin bilgilerini kontrol ediyorlar aynı zamanda hoş, vakit geçirmelerini sağlıyorlar.* [...I trained my friends who worked at different schools. Now, they have created a digital library with their students. By using Kahoot at their

schools, they both assess the learning of their students and allow them to have fun classes]".

Similar to that, T-53 stated that she shared the VR cardboards she received from the DTP with her colleagues and taught them how to use it. One of the colleagues conducted a project on VR by using the cardboard s/he received.

A good number of the teachers mentioned that they did not have chance or the opportunity to conduct structured trainings at their institutions, but they were able to provide informal trainings by casually assisting or lecturing their colleagues when they needed help with the use of technology. Some of them indicated that this casual help and trainings allowed their colleagues to (1) decrease their workload, (2) create more efficient and effective lessons, (3) enhance the quality of their lessons, (4) manage their time more efficiently, (5) write and coordinate various projects, (6) have a better reputation as a result of their projects, and (7) increase the recognition of their schools by sharing videos from the applications of using Web 2.0 tools on their social media accounts.

Lastly, there were some participants who expressed that they did not provide structured trainings, but they informed and highly encouraged their colleagues to participate in the following phases of the Digital Teachers Project. According to the data I acquired, at least 40 teachers had chance to participate in various phases of the project thanks to the encouragement of their co-workers who participated in the first 3 phases of the project. For example, T-215 and T- 153 each clearly stated that they inspired 6 colleagues to take part in the project.

4.2.2.3 Benefits for the Institutions

Most of the open-ended questions in the questionnaire were prepared in order to gather data on the benefits the schools directly gained from the project participants or their works. While analyzing the data for these questions, I found out many themes

that were related to the results at the organizational level. I categorized the themes and provided them as inclusive and brief as possible.

4.2.2.3.1 Reputation and Recognition

Many of the research participants stated that their schools gained reputation and recognition thanks to the participants' works and projects they conducted after gaining the necessary skills and knowledge from the Digital Teachers Project. The way the reputation was gained was diverse according to the information provided by the teachers. Three categories raised as a result of the classification of how the reputation was gained. Firstly, the teachers indicated that the parents, students, and co-workers liked their applications of integrating digital technologies into their classrooms. These three parties told people around them about the interesting and enjoyable classes of the teachers, which led reputation of the teachers and the schools to increase through word of mouth. For example, one of the teachers stated that "*Bulunduğum kuruma yeni gelmeme rağmen sınıfım konuşulur ve merak edilir oldu...* [Although I just started working at my current school, my classes are being told by people and they are curious about them...]".

Secondly, the reputation of the schools increased thanks to the projects that the research participants conducted. The projects were conducted at national and/or international level depending on the funding and host organization. Typically, many other schools and stakeholders enrolled in the projects, and they got familiar with the schools of the research participants, which led its popularity to grow up.

Lastly, some of the participants stated that the reputation and recognition of their schools increased through posts on the school website or social media accounts because they shared their applications and classes that were enhanced by Web 2.0 tools. For example, T-70 stated that:

“Aktif etkinlik paylaşımlarımız sayesinde okul web ve sosyal medya sayfalarımızda takipçi ve beğeni sayımız arttı. Diğer okullar tarafından takip edilmeye başlandık. Ayrıca bağlı olduğumuz Kaymakamlık ve İlçe Milli Eğitim Müdürlüğü kurumları tarafından takip edilmekteyiz. Kaymakamımız ve İlçe Milli Eğitim Müdürümüz çok sayıda etkinliğimize beğenileri ifade eden yanıtlar verdiler. [The followers and likes on our school social media accounts and website has increased as a result of sharing our activities regularly. Other schools started to follow our pages as well. Besides, the district governorship and district national educational directorate follow our pages as well. Our governor and district educational director have replied many of our activities and expressed their admiration.]”.

4.2.2.3.2 Certifications

Item number 5 in the questionnaire asked the participants whether their institutions received any rewards or certifications. A good number of the participants stated that their institutions received certificates at national and/or international levels. The most received one was the eTwinning quality certificates, followed by national competitions certificates. eTwinning is a European platform that promotes collaboration between schools across Europe and Turkey. The eTwinning quality certificate recognizes the efforts and achievements of teachers and schools in fostering high-quality international collaboration, engagement, digital skills, and innovative educational practices. It is a way to highlight the value of successful eTwinning projects and the positive outcomes they bring to the participating educators and students. The eTwinning quality certificate offers schools a range of benefits. It acknowledges and enhances a school’s reputation for excellence in collaborative and innovative teaching. This recognition fosters networking and professional development opportunities for teachers as well. Moreover, students experience enriched learning through international collaboration, digital skills

development, and exposure to diverse perspectives. For that, receiving the eTwinning quality certificate provided the institutions of the research participants with many benefits.

There were two participants stating two unusual certificates. One of them was ISO 14001 certificate and the other one was Eco-School Certificate. They did not specify why and how they received these certificates. Yet, I conducted mini research about them to understand why they are given and their connection to the digital technologies. ISO 14001 is an internationally recognized standard that provides a framework for organizations to manage their environmental responsibilities in a systematic and effective manner. It sets out the criteria for an environmental management system and helps organizations establish processes to identify, manage, and mitigate the environmental impacts of their activities, products, and services. The Eco-Schools program, on the other hand, promotes sustainability and environmental education in schools. It encourages students to take part in eco-friendly initiatives. The program offers an "Eco-School Certificate" to schools that meet criteria like waste reduction, energy conservation, and student involvement. This certificate showcases a school's commitment to sustainability and comes in different levels based on the extent of their green practices. Both programs seem to have a lot in common in terms of focusing on the environmental issues and waste management. Putting them both together and in a humble attempt to find their connection to the DTP, I figured out that the research participants might have been rewarded with these certificates because, by using the tools and technologies they learnt throughout the DTP, they reduced their waste and contributed to the sustainability of the environment as a result of using digital materials instead of printed ones.

4.2.2.3.3 Social Media / Website Works

The research participants mentioned that they became social media account or official website admins of their schools and improved the quality of the content there

with the tools and skills they acquired through the Digital Teachers Project. They used their knowledge of visual design principles, and Canva, Powtoon, Invideo and other tools to create better content or modify the existing ones in a short time. This escalated the site access rate and improved its rankings among the other schools. The visibility of the school is increased as a result.

4.2.2.3.4 Facilitating Complex Tasks and Enhancing Quality through Digitalization

A few of the participants asserted that they helped their organizations by facilitating complex tasks such as testing and evaluation of the students individually, conducting a survey and gathering data from the teachers or the students for specific purposes. They stated that they used to manage such a task with printed papers or text messages, but it was hard to collect the data and analyze it. After participating in the DTP, they have learnt to use Google Forms for collecting and summarizing data.

Some other participants stated that they have digitalized the printed materials or administrative works (such as meeting reports) at their schools. For example, some of them stated that the list of books and borrowing-returning process of their school libraries were all paper-based before the DTP project. However, after their participation in the project, they created basic library automation system where they kept digital records of the library resources and the details for circulation.

4.2.2.3.5 Renewing or Upgrading Computers and Smartboards

Another theme that occurred was upgrading the school's technology infrastructure. A few of the research participants expressed that they installed new programs or upgraded the existing software used on the computers and smartboards. Addition to

that, a few of the participants stated that the schools invested on the new and higher quality computers to support more usage of the educational technologies as a result of trusting in the qualification of their teachers. Overall, the upgrading infrastructure provided better quality content and faster completion of the tasks for their schools.

4.2.2.3.6 Reducing Costs

Lastly, a few of the research participants mentioned that their schools reduced their costs thanks to the DTP. After using more digital materials and digitalizing their existing paper works, the consumption of paper and ink decreased to a big extent. Addition to that, the time to accomplish a task at the school, such as preparing and sending letters to all parents, has been minimized thanks to the digitalization of the invitations.

CHAPTER 5

DISCUSSION

The previous chapter has presented the findings and outcomes of the present research. In this section, I present the comprehensive analysis and interpretation of these findings within the broader context of existing knowledge. Addition to that, I will establish their significance in advancing our understanding of importance of technology training in teacher education.

My endeavor in this discussion is threefold: first, to elucidate the meaning and relevance of our findings; second, to synthesize these findings with the established body of research in teacher education; and third, to identify both the strengths and limitations inherent in our study.

The present study mainly aimed at evaluating the effects of the Digital Teachers Project on Turkish public school teachers' learning, behaviors, technology usage habits, and contributions to their institutions. The evaluation process followed the guidelines of Kirkpatrick's 4-levels training evaluation model to find out answers to 4 research questions that are provided in the previous sections. The analysis and findings are meant to eventually provide valuable information to enhance or modify the teacher training curriculum and in-service trainings to develop the digital skills of the teachers with the main goal of increasing the quality of education by using digital technologies and appropriate methods.

I have used different sources of data to provide reliable results in the previous sections. The achievement scores of the project participants, their reaction survey data, quantitative and qualitative questions in the Digital Teachers Project's Impact

Evaluation Questionnaire were used to collect necessary information and data. Firstly, the satisfaction level of the participants was determined by using the reaction survey that was conducted after each phase of the project. Secondly, the learning of the participants was evaluated based on their answers to the quantitative questions, and the achievement scores that they acquired throughout the project. Lastly, the behavior of the teachers, and the contributions that they made to their institutions were evaluated based on their answers regarding their actions and practices in their workplace.

Conforming to these purposes, a detailed overview of the study, the main findings and discussion are presented through four levels of Kirkpatrick Model. By breaking down the analysis of each question and level, the aim is to gain a comprehensive understanding of the study's outcomes.

5.1 Satisfaction Level of the Participants

The first level of the Kirkpatrick model deals with the question of whether the participants were satisfied by the training or not. The reaction survey showed that almost all the participants were satisfied with the Digital Teachers Project, and they would recommend their friends to participate in the upcoming phases of the project. This consistent feedback serves as a notable indicator of the project's efficacy in meeting participants' expectations and generates a positive outlook.

The DTP is different than many training programs including those of the MoNE for some reasons. Besides having high quality course contents and effective teaching methodology, another most important feature of the DTP is to enable interaction

between the learners and the trainers via synchronous classes and communication channels (e-mail, forums, team chat etc.).

Also, the specialty and proficiency of the highly motivated trainers play a vital role in the positive feedback of the participants. Lastly, another reason that the participants were satisfied with the DTP is that the goals and outcomes of the project was relevant to their needs, and it provided tangible benefits for them as they stated in the qualitative part of the questionnaire.

Kirkpatrick and Kirkpatrick (2006) argued that if the program is successful at level 1, it will show that the program was desirable by the participants, it fulfilled their expectations, and the trainers do not necessarily need to modify the content at this point. As a result of the findings, I can confidently assert that the DTP was successful in accomplishing the first level of the Kirkpatrick Model.

5.2 Learning Level of the Participants

The second level of the Kirkpatrick model deals with the question of whether the participants have learnt the provided content or not. The quantitative questions in the questionnaire and the achievement scores of the research participants were used to find answer to this specific question. The results at general level showed that most of the participants learnt the training contents to a big extent. However, as mentioned previously, the quantitative question items were related, and the discussion should be based on the three themes to have a better understanding of the results.

To begin with, six of the statements tried to figure out teachers' confidence and competence in integrating technology into their teaching practices. Most of the participants' strong confidence in their technology skills is evident in how they

responded to the given statements. They feel sure about using computers for teaching, which shows that they are ready to handle digital tools. They are also confident in blending technology into their teaching practices, which highlights their belief in using digital resources to teach better and more effectively.

Their optimism continues to the use of educational technology in their teaching methods, indicating they see technology as an important part of their classrooms. Specifically, they are confident in using technology in ways that match their students' needs. This also shows that they know technology can be adapted for different learners.

They are also sure they can pick the right tool that fits with what they are teaching. This reveals their ability to choose tools that match their curriculum. As they think about the future, they are comfortable with the idea of using technology in their teaching. This also might be an indicator of readiness for the changes that technology brings.

To sum up, the participants' confidence paints a picture of the teachers who are ready and excited about using technology in their teaching. Their willingness to integrate technology into their teaching methods shows they are adapting to the modern teaching landscape of our age.

Secondly, four of the statements tried to figure out teachers' confidence in supporting students' technology use. The participants' belief in their technological capabilities becomes increasingly apparent when their responses to these statements are analyzed. Notably, they harbor a strong confidence in their capacity to step in and provide valuable assistance to students facing difficulty in navigating the realm of computers. Furthermore, their confidence underscores their commitment to a student-centric approach that guides the students to become more active in the learning process.

Moreover, the participants reveal a consistent belief in their capability to devise innovative strategies to overcome potential challenges posed by limited resources, such as budget constraints on technology facilities.

Overall, the responses from the teachers paint a clear picture of their readiness to tackle technological challenges, educate learners on digital literacy, provide customized assistance, and overcome difficulties in innovative ways. Their confidence in these areas shows their capability not only in technology but also in creating a well- rounded and fulfilling learning atmosphere. The teachers' strong confidence in their abilities positions them well to take the lead in incorporating technology to enhance student participation, understanding, and achievements.

Thirdly, three of the statements tried to figure out teachers' confidence in leveraging technology for student engagement and assessment. A vast majority of the participants state that they encourage and involve students in projects that use technology. This confidence reflects not just their technical know-how but also their enthusiasm for getting students actively involved in technology-enhanced learning. Another facet of their confidence is the ability of many teachers to effectively manage projects that involve technology. This means they are confident in assigning tasks that use technology and in grading them fairly. This skill is crucial for making sure that students' work is evaluated properly in a technology-rich learning environment. Lastly, their skill in using various technology tools, like spreadsheets and electronic portfolios, to collect and analyze data from student tests and projects is advanced. This confidence demonstrates their commitment to using data to improve their teaching methods based on what they learn from students' work.

In a nutshell, the participants' confidence does not just lie in their technology abilities but also in their capacity to inspire and engage students in technology-based projects, their skill in managing such projects, and their readiness to use technology tools for data-driven improvements in teaching. This wide-ranging confidence highlights their proficiency and adaptability in creating an engaging learning experience with technology.

As mentioned in the results section, the self-reports of the participants on their beliefs on using technology in their classes were not satisfying enough to prove that the learning level was achieved. That's why, I used the achievement scores that were taken for the tasks assigned during the project. The teachers' high performance in their assigned tasks was evidence of their comprehensive understanding and successful integration of acquired knowledge. Their consistently high grades demonstrated their proficiency in applying what they had learned, which highlights the effectiveness of the Digital Teachers Project on the skills and knowledge of the participants.

Putting them all together, teachers display a high level of confidence in their technological abilities, which reflects their eagerness to incorporate technology into their teaching methods. They are adept at addressing technological challenges, promoting digital literacy, and offering individualized support. Their flexibility and innovative mindset make them pioneers in utilizing technology to enhance student engagement, understanding, and success, leading to a dynamic and enriching learning experience. The significant accomplishment of their tasks and the remarkable achievement scores further solidify the notion that their confidence is not just a surface-level perception but indeed a reflection of their deep understanding and application of the knowledge and skills they acquired through the DTP. As a

result of these findings, it is concluded that the Digital Teachers Project was exceptionally successful in accomplishing the second level of the Kirkpatrick Model.

5.3 Behaviors of the Participants

The third level of the Kirkpatrick model deals with the question of whether the participants transfer what they have learnt to their workplace. In other words, it tries to figure out if there are any positive changes in the participants' behaviors. Some of the open-ended questions tried to find answer to this question. The questions asked the participants to self-evaluate their behaviors at the workplace in terms of integrating digital technologies. The results at general level showed that many of the participants successfully applied the training contents to their teaching practices and administrative works. A few themes occurred at this point as a result of qualitative data analysis. Firstly, many participants expressed similar thoughts and actions in terms of using the tools for their teaching practices, which made us sure that the project was successful in mastering the skills of the teachers in learning and using Web 2.0 tools to provide a better and more effective education. Besides, the DTP increased the awareness of the participants for the existence and usability of a huge range of digital technologies for educational purposes. In other words, they were not strictly bond to the tools within the scope of the project. The teachers learned from the training program, but they did not stop at what they were taught. The program motivated them to discover different tools that fit what they needed for teaching. They realized there are lots of tools online that can help them with almost anything they want to do in teaching. They learned about these tools and adapted them to enhance their teaching practices effectively.

Another theme was that not only the participants learnt the content but also, they transferred their knowledge to their colleagues or students by conducting seminars or offering guidance on the use of the tools. Participants indicated that they often conducted seminars and provided guidance to various groups on multiple occasions. These groups ranged from students to parents and fellow teachers. The seminar topics closely mirrored those covered in the Digital Teachers Project, encompassing areas such as digital security, digital citizenship, utilization of specific Web 2.0 tools, integrating educational technologies into the classroom, and optimizing smart boards and computers for effective teaching. The choice of topics was tailored to the specific needs of each target group. While some participants expressed limited opportunities for formal seminars, they creatively found ways to indirectly share their newfound knowledge with both students and colleagues.

Thirdly, some participants highlighted that the technological tools they learned had a positive impact on various aspects of their work. This influence extended to both personal and professional realms. On a personal level, participants reported improvements in their digital security, better digital well-being, enhanced digital literacy, and more efficient daily task management. This translated into improved online communication and internet usage habits. Furthermore, they applied their learning to professional endeavors, like creating digital content, digitizing paperwork, utilizing online tools for daily tasks, and strengthening school systems' digital security.

Lastly, the study found that almost one third of the teachers participated in various projects or competitions by using the tools they learnt from the DTP. This suggests that the training had an impact on the teachers' behaviors, as it motivated them to use the tools they learnt in a practical way. The projects that the teachers participated in were related to digital technologies and digital citizenship, which suggests that the training also helped the teachers to develop a better understanding of these topics.

The study also found that the teachers used the tools for a variety of purposes, such as creating project materials, posters, logos, videos, photo collages, presentations, and project reports. This suggests that the training helped the teachers to develop a variety of skills that they could use in their projects.

Overall, I can discuss that the participants transferred their knowledge to their workplace and educational practices. They used the tools they learnt to improve their teaching and to enhance the learning experience for their students. They also shared their knowledge with their colleagues and students. As a result of these findings, it is concluded that the Digital Teachers Project was successful in accomplishing the third level of the Kirkpatrick Model as well.

5.4 Contributions to the Workplace

The fourth level of the Kirkpatrick model deals with the question of whether the participants contributed to their workplaces or not. In other words, it tries to figure out if there are any tangible benefits that the organizations received thanks to the training programs. Some of the open-ended questions tried to find answer to this question. The questions asked the participants to self-evaluate their contributions to the workplaces.

Thematic analysis revealed three primary categories and corresponding sub-categories elucidating the benefits of DTP. The benefits were received by the students, the colleagues, and the institutions. It is imperative to note that while focusing on students and colleagues, the teachers' contributions to them indirectly influence the development of their organizations, provided these contributions manifest in transformative ways. In order to ensure the quality and authenticity of

these benefits, further validation was sought. Examples of students' works and teachers' projects demonstrated the effective transfer of learning, while supporting evidence from schools' online presence indicated successful project implementations.

A significant aspect of the program's impact lies in the teachers' transfer of knowledge regarding Web 2.0 tools, digital security, and digital citizenship to their students. This transfer facilitated students in diverse ways, enabling them to craft digital content, help digital security awareness, participate in competitions, develop robotics or game coding skills, and cultivate increased motivation for learning and engagement in curricular activities. Their products and high motivation increased school reputation, school success rate, and students' behavior management.

Parallel to students, the skills that the project participants acquired cascaded benefits onto their colleagues. They conveyed their knowledge of Web 2.0 tools, digital security, and digital citizenship to colleagues within their schools and across different institutions in their cities. Numerous participants conducted workshops and training sessions, disseminating expertise on Web 2.0 tools, digital literacy, and security. For teachers without structured training opportunities, casual assistance helped to decrease workload, and enhance lesson efficiency and quality. Moreover, the encouragement to participate in following DTP semesters further augmented colleague involvement. I believe that this case is not an example of direct transfer of learning to the colleagues. Yet, it is an indirect way of transferring their knowledge and helping the others to benefit from the project as well.

Open-ended questionnaire responses directed toward institutional benefits yielded themes indicative of organizational-level impacts. The schools gained recognition and reputation through projects facilitated by participants' acquired knowledge and skills.

Besides, some participants streamlined tasks like student assessments and data collection using tools like Google Forms, while others digitized administrative processes such as library resource management after participating in the DTP. Some of them helped to renew or upgrade the schools' technology infrastructure. In this way, they helped digital transformation of their schools addition to reducing paper and other waste amount. In fact, many of the statements emphasizing the usage of digital materials and contents is expected to reduce the waste and cost of the printed materials and decrease the time to complete a work conducted via computers. However, surprisingly, not many of the participants mentioned these facts explicitly. Yet, I assume that the benefits were present at the institutions. As a result of these findings, it is concluded that the Digital Teachers Project was successful in accomplishing the last level of the Kirkpatrick Model as well.

5.5 Conclusion

In conclusion, this study has illuminated the profound impact of the Digital Teachers Project (DTP) on Turkish public-school teachers. Delving into the depths of their experiences and responses, I have uncovered insights that speak to the program's success in fostering digital transformation of education. The multi-faceted nature of this investigation has allowed me to draw significant conclusions across different dimensions.

The exploration into the satisfaction level of participants revealed an overwhelmingly positive response. The holistic approach of the project, combining high-quality content, expert instruction, interactive sessions, and practical relevance,

played a crucial role in cultivating this satisfaction. This success echoes the initial level of Kirkpatrick's model, showcasing the project's efficacy in capturing participants' enthusiasm and engagement.

Venturing deeper into the learning level of the participants, I found their self-evaluation and task performance to be indicative of a firm grasp of technological concepts. Their demonstrated confidence in integrating technology into their teaching methods reflects not only their technical competence but also their readiness to embrace modern pedagogical landscapes. This level of preparedness positions them as change agents in utilizing technology to enrich student engagement and understanding, showcasing the DTP's accomplishment at the second level of Kirkpatrick's model.

The participants' inclination to share knowledge through seminars, guide colleagues, and creatively apply technological tools in diverse educational scenarios highlights the project's profound impact. In this realm, the DTP's achievement echoes Kirkpatrick's third level, demonstrating its success in inspiring practical integration of learning outcomes.

Extending the view to the contributions of participants to their workplaces, a wave effect that extends beyond individuals to institutions is witnessed. The tangible benefits experienced by students, colleagues, and schools themselves underscore the project's broader influence. By taking the enhanced student engagement, streamlined administrative processes, reputation of the institutions, and reducing costs at the workplace etc. into consideration, it can be concluded that the transformative power of the DTP has generated a positive wave of change. These institutional impacts align with Kirkpatrick's fourth level, reinforcing the program's ability to drive organizational progress.

In summation, the Digital Teachers Project stands as a source of inspiration of success in the realm of teacher education on digital technologies. Its profound impact on satisfaction, learning, behavior, and institutional contributions underscores its alignment with Kirkpatrick's model and its potential to elevate educational practices.

5.6 Implications

The implications of the present study are far-reaching and have practical relevance for teacher education and training. The thorough analysis of the Digital Teachers Project (DTP) highlights its efficacy in enhancing teachers' technological confidence, skills, and their subsequent impact on students and institutions. The study emphasizes the significance of well-designed, interactive, and comprehensive teacher training programs. It underscores the significance of methodological design and high-quality content delivery in teacher training programs. The DTP's approach of hands-on learning, individualized support, and emphasis on practical application serves as a model for effective teacher training. Stakeholders, including curriculum designers and training developers, may consider the outstanding success of the Digital Teachers Project as a model for shaping teacher education programs. They may consider adopting similar methodologies to equip educators with the essential digital competencies required in today's rapidly evolving educational landscape. The findings support the notion that integrating more technology-related modules into teacher education and continuous professional development can substantially enhance the quality of education, foster innovative teaching practices, help digital transformation, and ultimately contribute to better student outcomes.

5.7 Recommendations for Further Research

It is recommended that further research be conducted to delve deeper into the impact of technology training on teaching practices and student outcomes. Longitudinal studies could provide insights into the lasting effects of technology training on educational environments. Moreover, investigating strategies to make technology training more inclusive and accessible will contribute to creating equitable learning opportunities for all educators. Lastly, the effects of the other in-service training programs may also be studied to evaluate their impacts on the teachers and have data to contrast the results of the current study with. By addressing these avenues, the field can continue to evolve, fostering enhanced pedagogical practices and elevating the overall quality of education.

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APPENDICES

A. Ethical Permission

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER

ORTA DOĞU TEKNİK ÜNİVERSİTESİ
MIDDLE EAST TECHNICAL UNIVERSITY

DUMLUPINAR BULVARI 06800
ÇANKAYA ANKARA/TURKEY
T: +90 312 210 22 91
F: +90 312 210 79 99
ueam@metu.edu.tr
www.ueam.metu.edu.tr

Konu: Değerlendirme Sonucu 19 HAZİRAN 2023

Gönderen: ODTÜ İnsan Araştırmaları Etik Kurulu (İAEK)

İlgi: İnsan Araştırmaları Etik Kurulu Başvurusu

Sayın Dr. Öğretim Üyesi Göknur Kaplan

Danışmanlığımı yürüttüğünüz Serhat Orhak'un "*Digital Teachers: Training Teachers for the Digital Era*" başlıklı araştırmanız İnsan Araştırmaları Etik Kurulu tarafından uygun görülerek 317-ODTÜİAEK-2023 protokol numarası ile onaylanmıştır.

Bilgilerinize saygılarımla sunarım.

Prof. Dr. Ş. Halil TURAN
Başkan

Prof. Dr. İ. Semih AKÇOMAK
Üye

Doç. Dr. Ali Emre Turgut
Üye

Doç. Dr. Şerife SEVİNÇ
Üye

Doç. Dr. Murat Perit ÇAKIR
Üye

Dr. Öğretim Üyesi Süreyya ÖZCAN KABASAKAL
Üye

Dr. Öğretim Üyesi Müge GÜNDÜZ
Üye

B. Digital Teachers Project's Impact Evaluation Questionnaire

DİJİTAL ÖĞRETMENLER PROJESİ ETKİ DEĞERLENDİRME ANKETİ

1. BİLGİLENDİRİLMİŞ ONAM FORMU

Bu araştırma, ODTÜ Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü Yüksek Lisans öğrencisi Serhat Orhak tarafından Doç. Dr. Göknur Kaplan ve Prof. Dr. Kürşat Çağiltay eş danışmanlığındaki yüksek lisans tezi kapsamında yürütülmektedir. Bu form sizi araştırma koşulları hakkında bilgilendirmek için hazırlanmıştır. Formu kolaylıkla tamamlamak için Google Chrome tarayıcısı kullanmanız önerilir.

Çalışmanın Amacı Nedir?

Araştırmanın amacı, katılımcıların Dijital Öğretmenler projesi kapsamında elde ettikleri bilgi ve kazanımlarının belirlenmesi, ve bu katılımcılarının kurumlarına, öğretmenlere veya öğrencilerine yaptıkları katkıların belirlenmesi ile ilgili bilgi toplamaktır.

Bize Nasıl Yardımcı Olmanızı İsteyeceğiz?

Araştırmaya katılmayı kabul ederseniz, sizden beklenen, ankette yer alan bir dizi soruyu derecelendirme ölçeği üzerinde yanıtlamanız ve açık uçlu soruları cevaplandırmanızdır. Bu çalışmaya katılımın ortalama olarak 15 dakika sürmesi beklenmektedir.

Sizden Topladığımız Bilgileri Nasıl Kullanacağız?

Araştırmaya katılımınız tamamen gönüllülük temelinde olmalıdır. Cevaplarınız gizli tutulacak, sadece araştırmacılar tarafından değerlendirilecektir. Katılımcılardan elde edilecek bilgiler toplu halde değerlendirilecek ve bilimsel yayımlarda kullanılacaktır. Sağladığımız veriler gönüllü katılım formlarında toplanan kimlik bilgileri ile eşleştirilmeyecektir.

Katılımınızla ilgili bilmeniz gerekenler:

Anket, kişisel rahatsızlık verecek sorular içermemektedir. Ancak, katılım sırasında sorulardan ya da herhangi başka bir nedenden ötürü kendinizi rahatsız hissederseniz cevaplama işini yarıda bırakıp katılımınızı sonlandırabilirsiniz.

Araştırmayla ilgili daha fazla bilgi almak isterseniz:

Anket sonunda, bu çalışmayla ilgili sorularınız cevaplanacaktır. Bu çalışmaya katıldığınız için şimdiden teşekkür ederiz. Çalışma hakkında daha fazla bilgi almak için ODTÜ Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü Yüksek Lisans Öğrencisi Serhat Orhak (serhat.orhak@metu.edu.tr) ile iletişim kurabilirsiniz.

2.KİŞİSEL BİLGİLER

Adınız Soyadınız:

.....

E-posta adresiniz:

.....

3.NİCEL SORULAR

Lütfen bu bölümde, Dijital öğretmenler projesi sayesinde elde ettiğiniz kazanım ve tecrübeleri düşünerek sizi en iyi yansıtan seçenekleri işaretleyiniz. Soruların doğru veya yanlış cevapları yoktur. Lütfen **tüm sorulara** kendi deneyim ve bilgilerinize göre en içten şekilde cevap veriniz. Ölçek aşağıdaki gibidir.

- 1 - Kesinlikle katılmıyorum
- 2 - Katılmıyorum
- 3 - Kararsızım
- 4 - Katılıyorum
- 5 - Kesinlikle katılıyorum

	1	2	3	4	5
1- Öğretim amaçlı bilgisayar kullanmak için gerekli becerilere sahip olduğuma inanıyorum.					
2- Uygun teknolojiyi kullanarak ilgili ders içeriğini başarılı bir şekilde öğretebileceğime inanıyorum.					
3- Öğrenciler bilgisayarla ilgili bir zorlukla karşılaştıklarında onlara yardım edebileceğime inanıyorum.					
4- Öğrencilerimi teknoloji tabanlı projelere katılmaları için motive edebileceğime inanıyorum					
5- Teknolojinin uygun biçimlerde kullanılması ile ilgili olarak öğrencilerime rehberlik edebileceğime inanıyorum.					
6- Eğitim teknolojisini her zaman etkili yollarla kullanabileceğime inanıyorum.					
7- Öğrencilerime teknolojiyi kullandıkları sırada bireysel geribildirimler verebileceğime inanıyorum.					
8- Öğrencilerimin öğrenmesi için uygun zamanlarda derslerime düzenli olarak teknolojiyi dahil edebileceğime inanıyorum.					
9- Öğretim programı çerçevesinde belirlenmiş ölçütlere dayalı öğretim için uygun teknolojileri seçebileceğime inanıyorum.					
10- Teknoloji tabanlı projeler verebileceğime ve bunları değerlendirebileceğime inanıyorum.					
11- Öğretim etkinliklerini iyileştirmek için öğrencilerin sınav sonuçları ile onların ürünlerine ait verileri toplama ve analiz etmede teknolojik olanakları (elektronik hesaplama tabloları, elektronik portfolyoları, vb.) kullanabileceğime inanıyorum.					
12- Öğretimim sırasında teknolojinin kullanımı konusunda rahat olacağıma inanıyorum.					
13- Sistemden kaynaklanabilecek kısıtlamalarla (teknolojik olanaklarda bütçe kesintisi gibi) baş edebilmek için yaratıcı yollar geliştirebileceğime ve teknoloji ile etkili bir biçimde öğretimi sürdürebileceğime inanıyorum					

4.NİCEL SORULAR

Lütfen bu bölümde, Dijital öğretmenler projesi sayesinde elde ettiğiniz kazanım ve tecrübeleri düşünerek sorulara cevaplar veriniz. Soruların doğru veya yanlış cevapları yoktur. Lütfen tüm sorulara kendi deneyim ve bilgilerinize göre en içten şekilde cevap veriniz. Yanıtlamak istemediğiniz soru olursa "Hayır" ya da "H" yazarak atlayabilirsiniz. Ancak, sorulara vereceğiniz küçük cevaplar bile bizim çalışmamız için çok değerli olabilir.

1- Dijital Öğretmenler projesinde edindiğiniz bilgi ve becerileri kullanarak sınıfınızda veya kurumunuzda ne tür etkinlikler yaptınız?

2- Öğrencileriniz sizden öğrendikleri dijital teknolojileri kullanarak farklı projeler veya ürünler geliştirdi mi? Evet ise, örnekler verebilir misiniz?

3- Öğrencileriniz sizin liderliğinizde veya sizden bağımsız, onlara öğrettiğiniz dijital teknolojileri kullanarak herhangi bir yarışmaya katıldı mı? Evet ise, örnekler verebilir misiniz?

4- Çalıştığınız kurum(lar)da Dijital Öğretmenler projesinde edindiğiniz bilgi ve becerileri öğrencilere veya diğer eğitimcilere aktarmak için herhangi bir eğitim verdiniz mi ya da atölye çalışması yaptınız mı? Evet ise, örnekler verebilir misiniz?

5- Kurumunuz Dijital Öğretmenler projesinde edindiğiniz bilgi ve becerilerin kullanılması sebebiyle herhangi bir ödül veya sertifika aldı mı? Evet ise, örnekler verebilir misiniz?

6- Dijital Öğretmenler projesinde edindiğiniz bilgi ve becerileri kullanarak kurumunuzda yürütülen işleri hızlandırdınız veya kolaylaştırdınız mı? Evet ise,

örnekler verebilir misiniz? (Örneğin: ölçme değerlendirme sürecinin elektronik ortamda yapılması gibi.)

7- Dijital Öğretmenler projesinde edindiğiniz bilgi ve becerilerin sonucu olarak kurumunuzda mevcut olan bilgisayar ve diğer dijital teknolojilerin kullanımını arttı mı? Nasıl?

8- Dijital Öğretmenler projesinde edindiğiniz bilgi ve becerilerin sonucu olarak kurumunuzda mevcut olan bilgisayar ve diğer dijital teknolojilerin niteliği arttı mı? Evet ise, nasıl bir değişim oldu?

9- Dijital Öğretmenler projesinde edindiğiniz bilgi ve becerilerin kullanılması sonucunda kurumunuzun tanınırlığı veya bilinirliği arttı mı? Nasıl?

10- Dijital Öğretmenler projesinde edindiğiniz bilgi ve becerilerin sonucu olarak dijital teknolojileri kullanma sıklığınız ne kadar arttı? Eğer kullanım sıklığınız arttıysa, bu durum öğrencilerinize ve çalıştığınız kuruma nasıl yansdı?

11- Ders verirken Dijital Öğretmenler projesinde öğrendiğiniz eğitim teknolojilerini kullanıyor musunuz? Evet ise nerede ve nasıl kullandığınıza örnekler verir misiniz?

5. DEMOGRAFİK BİLGİLER

Bu bölümde sizlerden bazı demografik bilgiler isteyeceğiz. Bu bilgilerin hiçbiri çalışmaya bireysel olarak dahil edilmeyecek sadece yaş aralığı, branş, şehir gibi bilgiler tablolar halinde yüzdeler halinde bilgi olarak paylaşılacaktır. Tüm cevaplarınız saklı

tutulacak ve verdiđiniz cevaplar alıřmanın hibir yerinde adınız soyadınız ile eřleřtirilmeyecektir.

1. Yařınız nedir? (örneđin; 25 - 29 arası seeneđi 25'ten bařlayıp 29 dahil olan yařları kapsamaktadır.)
2. Cinsiyetiniz nedir?
3. Hangi okul türünde alıřıyorsunuz? Farklı kademelerde alıřıyorsanız en ok dersinizin olduđu okul türünü iřaretleyiniz.
4. Branřınız nedir? (Liste alfabetik sıralıdır.)
5. Hangi řehirde alıřıyorsunuz? (Liste alfabetik sıralıdır.)
6. Dijital öđretmenler projesine hangi yıl katıldınız?
7. Dijital öđretmenler projesini ... - Katılım sertifikası ile bařarıyla tamamladım.
- Bařarı sertifikası ile bařarıyla tamamladım.
8. Dijital öđretmenler projesinde 2.faz eđitimlerine (sanal ve arttırılmıř gerçeklik eđitimleri) dahil olan řanslı ilk 100'ün içinde miydiniz? :)
9. Bu alıřmanın amacı ve sonuçları ile ilgili sizinle iletiřime gememizi ister misiniz? Eđer isterseniz ařađıya e-posta adresinizi yazınız.

6. ANKET İLE İLGİLİ GERİ DÖNÜT

Bu anket veya arařtırmamız ile ilgili geri dönüt vermek isterseniz ařađıya yazabilirsiniz. Okulunuzda yaptığımız alıřmalar ile ilgili bizimle özel olarak online görüřme talebi, ankette varsa imla hatası, teknik sorun/cihazda uyumsuzluk, zaman sorunu vb. gibi konulardan bahsedebilirsiniz.

.....
.....

C. Permission to Use the Survey



Erhan Unal <erhanbote@gmail.com>

Alıcı: ben ▾

Merhabalar,
Ölçeği kullanabilirsiniz. Çalışmanızda kolaylıklar dilerim.

Serhat ORHAK <orhakserhat@gmail.com>, 4 Tem 2022 Pzt, 18:19 tarihinde şunu yazdı:



--

Dr. Erhan ÜNAL
Afyon Kocatepe Üniversitesi
Afyonkarahisar/Türkiye

Erhan ÜNAL, Ph.D.
Afyon Kocatepe University
Afyonkarahisar/Turkey

D. Invitation E-Mail

Değerli Öğretmenim,

Bu e-postayı Dijital Öğretmenler Projesine katılım gösterdiğiniz için almaktasınız.

Ben Serhat Orhak. ODTÜ Bilgisayar ve Öğretim Teknolojileri Eğitimi Yüksek Lisans öğrencisiyim. Aynı zamanda Dijital Öğretmenler projesinin 4., 5. ve 6. dönemlerinin eğitmenlerindenim. Doç. Dr. Göknur Kaplan ve Prof. Dr. Kürşat Çağıltay danışmanlığında, Dijital Öğretmenler projesini temel alan yüksek lisans tezim kapsamında bir araştırmaya katılmaya davet etmek üzere sizlere bu maili göndermekteyim.

Öncelikle, Dijital Öğretmenler ekibi olarak ülkemizde yaşanan ve yaşanmaya devam eden büyük depremlerden dolayı çok üzüldüğümüzü belirtmek isterim. Yaşananlardan dolayı sizin ve ailenizin sağlıklı olduğunu ümit ediyorum. Bizler ilk gün olduğu gibi halen depremden etkilenen herkesi düşünüyor ve bu doğrultuda elimizden geleni yapmaya devam ediyoruz. Bu zorlu ve acı günleri dayanışma ile atlatabileceğimize olan inancımız devam ediyor.

Yüksek lisans tezim kapsamında Dijital Öğretmenler projesi aracılığıyla edindiğiniz bilgi ve becerilerin sizlerin iş hayatına, çalıştığınız kurumdaki meslektaşlarınıza, öğrencilere ve genel olarak okullarınıza nasıl bir etkisi olduğunu incelemek istiyoruz. Bu kapsamda siz değerli katılımcılarımızın, katkılarıyla elde edeceğimiz sonuçların, bu projenin sürdürülmesine ve hem hizmet içi eğitimlerinde hem de öğretmenlik lisans programlarında dijital teknolojilerin daha fazla yer edinmesine muazzam bir katkı sağlayacağından eminiz.

Bu dođrultuda, alıřmaya katılmak isterseniz bu [bađlantıya](#) tıklayabilirsiniz. Bu alıřmanın bařarıyla sonulanabilmesi yalnızca siz deđerli đretmenlerimizin iten katılımı ile gerekleřecektir. Sizlerin desteđi olmadan đretmenlik programları ve đretmen eđitimi belki de hep řu anki haliyle eksik olarak kalacaktır.

alıřmaya katkılarınız iin řimdiden teřekkür ederim. Hepimize sađlıklı ve gzel gnler dilerim.

Serhat Orhak

ODT Bilgisayar ve đretim Teknolojileri Blm

serhat.orhak@metu.edu.tr

E. Reminder E-Mail

Değerli Öğretmenim,

Bu e-postayı Dijital Öğretmenler Projesine katılım gösterdiğiniz için almaktasınız.

Doç. Dr. Göknur Kaplan ve Prof. Dr. Kürşat Çağiltay danışmanlığında, Dijital Öğretmenler projesini temel alan yüksek lisans tezim kapsamında bir araştırmaya katılmaya davet etmek üzere sizlere bu maili göndermekteyim.

Yüksek lisans tezimde Dijital Öğretmenler projesi aracılığıyla edindiğiniz bilgi ve becerilerin sizlerin iş hayatına, çalıştığımız kurumdaki meslektaşlarınıza, öğrencilere ve genel olarak okullarınıza nasıl bir etkisi olduğunu incelemek istiyoruz. Bu kapsamda siz değerli katılımcılarımızın, katkılarıyla elde edeceğimiz sonuçların, bu projenin sürdürülmesine ve hem hizmet içi eğitimlerinde hem de öğretmenlik lisans programlarında dijital teknolojilerin daha fazla yer edinmesine muazzam bir katkı sağlayacağından eminiz.

Bu doğrultuda, eğer önceki e-postada gönderilen anketi henüz doldurmadıysanız bu <https://forms.gle/ntr2DsVYTzkD3WBw6> adresinden anketi doldurabilirsiniz. Bu çalışmanın başarıyla sonuçlanabilmesi yalnızca siz değerli öğretmenlerimizin içten katılımı ile gerçekleşecektir. Sizlerin desteği olmadan öğretmenlik programları ve öğretmen eğitimleri belki de hep şu anki haliyle eksik olarak kalacaktır.

Çalışmaya katkılarınız için şimdiden teşekkür ederim. Hepimize sağlıklı ve güzel günler dilerim.

Serhat Orhak

ODTÜ Bilgisayar ve Öğretim Teknolojileri Bölümü

serhat.orkak@metu.edu.tr

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YAZARIN / AUTHOR

Soyadı / Surname : ORHAK

Adı / Name : SERHAT

Bölümü / Department : BİLGİSAYAR ve ÖĞRETİM TEKNOLOJİLERİ EĞİTİMİ BÖLÜMÜ

TEZİN ADI / TITLE OF THE THESIS (İngilizce / English) : A KIRKPATRICK MODEL
PERSPECTIVE ON THE TRANSFORMATIVE POWER OF THE DIGITAL TEACHERS PROJECT

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Yazarın imzası / Signature

Tarih / Date 05 EYLÜL 2023