A META-ANALYSİS OF GENDER IMPACT, TEACHERS' PERCEPTİON, AND IMPLEMENTATİON OF TECHNOLOGY İN EFL TEACHİNG İN TURKEY

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MASTER'S THESIS

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English Language Teaching
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İstanbul
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JÜRİ VE ENSTİTÜ ONAYI

Bu belge, Yükseköğretim Kurulu tarafından 19.01.2021 tarihli "Lisansüstü Tezlerin Elektronik Ortamda Toplanması, Düzenlenmesi ve Erişime Açılmasına İlişkin Yönerge" ile bildirilen 6689 Sayılı Kişisel Verilerin Korunması Kanunu kapsamında gizlenmiştir.

ETİK İLKE VE KURALLARA UYUM BEYANI

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ACKNOWLEDGEMENTS

Words cannot express my gratitude to my supervisor Prof. Dr. Aysu Erden. She has done tremendous efforts throughout this academic journey. Besides, I am really grateful to Lecturer Özlem Pervan for supporting and motivating me.

Moreover, I would like to thank my mother who inspired and motivated me psychologically and morally and paved all the ways to make everything seem better to me Zahraa Tulimat. Also, I cannot forget my brothers Ahmad and Obada Alaref who have always supported me. Furthermore, it is really important to mention my wife and son who have always been the source of my hope and peace, Bushra and Jalal Alaref, in every step of my life. In addition, my sincere thanks to my father-in-law and his wife Jamal and Suad Alomer.

Finally, my prays to the One (Allah) who makes everything from nothing.

Alaa ALAREF

September / 2022

ÖZ

TOPLUMSAL CİNSİYET ETKİSİNİN META ANALİZİ, ÖĞRETMENLER TÜRKİYE'DE İNGİLİZCE ÖĞRETİMİNDE TEKNOLOJİ ALGISI VE UYGULANMASI

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Yüksek Lisans Tezi

Yabancı Diller Eğitimi Anabilim Dalı

İngiliz Dili Eğitimi Yüksek Lisans Programı

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Maltepe Üniversitesi Lisansüstü Eğitim Enstitüsü, 2022

Bu çalışma teknolojinin günlük hayatımızdaki, özellikle de eğitimdeki önemini vurgulamaktadır. Araştırma Türkiye'de Covid-19 pandemisi sırasında yürütülmüş ve son 10 yılda yayımlanan 20 ilgili makaleyi araştırmak için kapsamlı bir meta-analiz metodolojisi ile gerçekleştirilmiştir. Bu makale; yabancı dil olarak İngilizce öğreten Türk öğretmenlerinin ve öğretmen adaylarının teknolojiyi uygulama yetkinliği ve onların eğitimde teknoloji kullanımı hakkında düşünceleri ile ilgili üç soruyu yanıtlamayı amaçlamıştır. Son olarak, toplanan makalelerden bazıları, cinsiyetin teknoloji üzerindeki etkisi, teknolojiyi uygulama tutumu ve Türkiye'de İngilizce öğretiminde teknoloji kullanımının yeterliliği hakkında bulgular sunmuştur. Araştırmanın bulguları, yabancı dil olarak İngilizce öğreten Türk öğretmenlerinin çoğunluğunun teknolojiyi sınıflarında kullanma konusunda olumlu bir algıya sahip olduğunu doğrulamaktadır.

Bu, ayrıca göstermektedir ki bu öğretmenler teknolojiyi mesleklerinde uygulamada yüksek düzeyde yetkindir. Son olarak, seçilen makalelerden toplanan veriler, teknoloji algıları veya dijital okuryazarlık yeterlilikleri açısından erkek ve kadın öğretmenler arasında çok az fark olduğunu ya da önemli bir fark olmadığını doğruladı.

Anahtar Sözcükler: dijital okuryazarlık, teknoloji entegrasyonu, öğretmen algıları, öğretmenlerin teknolojik bilgisi, meta-analiz, cinsiyet, mesleki gelişim.

ABSTRACT

A META-ANALYSİS OF GENDER IMPACT, TEACHERS' PERCEPTİON, AND IMPLEMENTATİON OF TECHNOLOGY İN EFL TEACHİNG İN TURKEY

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Master Thesis

Department of Foreign Language Education

English Language Teaching Program

Advisor: Prof. Dr. Aysu Erden

Maltepe University Graduate School, 2022

This study emphasizes the importance of technology in education. The investigation took place during the Covid-19 pandemic in Turkey and was performed through a thorough meta-analysis methodology to investigate 20 related articles issued during the last 10 years. The thesis aimed at answering three questions about Turkish EFL teachers' and candidate-teachers' perceptions of technology in teaching, in addition to their technology implementation effectiveness. Also, some of the collected articles provided findings about the impact of gender on technology, the attitude of technology implementation as well as the competence of technology use in English teaching in Turkey. The findings of the research confirm that the majority of English as a foreign language Turkish teachers have a positive perception of deploying technology in their classrooms. It also showed that these teachers have a high level of competence and effectiveness of technology implementation. Finally, the collected data from the chosen articles confirmed that there is little or no significant difference between male and female teachers in regard to their perception of technology or their digital literacy competence.

Keywords: digital literacy, technology integration, teachers' perceptions, teachers' technological knowledge, meta-analysis, gender, professional development.

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ABBREVIATIONS

Abbreviations	Descriptions
ICT	**:** Information and Communication Technology
TPACK	**:** Technological, Pedagogical, and Content Knowledge
PCK	**:** Pedagogical Content Knowledge
TCK	**:** Technological Content Knowledge
TPK	: Technological Pedagogical Knowledge
EFL	**:** English as a Foreign Language
ESL	**:** English as a Second Language
UNESCO	**:** United Nations Educational, Scientific and Cultural Organization
KSAs	**:** Knowledge, Skills, and Attitudes
JISC	**:** Joint Information Systems Committee
PT	**:** Preservice Teacher
TEI	**:** Teacher Education Institute
SPSS	**:** Statistical Package for Social Sciences
OI	**:** Online Instruction
DE	**:** Distance Education
ANOVA	**:** Analysis of Variance
HSD	**:** Honestly Significant Difference
CALL	**:** Computer Assisted Language Learning
EDC	**:** Education Development Center
U.S. DOE	**:** United States Department of Education
US	**:** United States

1. INTRODUCTION

1.1 The Research Background

In a globalized world, in the 21st century, utilizing technology has become a must for a modern and more contemporary life. Education is among the most affected aspects in terms of the tremendous benefits it gained due to the non-stop advances technology is scoring. Educational scholars perceived this crucial point in developing, adopting, and adapting digital literacy and that is necessary to build a competitive and capable generation.

The Covid-19 pandemic contributed to largely widening and promoting the use of technology in education. EFL teachers and students, among other subjects, achieved enormous leaps towards implementing the latest technology available in their online educational system. This urgent situation highlighted the extreme importance of adequately preparing learners and educators for such circumstances. The Covid-19 pandemic has been an opportunity for the society, especially educational institutions, to keep the educational system prepared and technologically capable.

This study aims at investigating the teachers' understanding and attitudes towards technology in education. The researcher managed the research by analyzing 20 articles in Turkey between 2012-2022. The research adopted the meta-analysis methodology by collecting and analyzing 20 articles written during the aforementioned period of time about the targeted topics. Also, it investigates EFL teachers' effectiveness of implementing digital tools in their profession. The researcher collects and examines 20 articles written during the past 10 years about the aforementioned topics in Turkey.

1.2 The Research Questions and Objectives

The aim of the study is to compile the teachers' (pre-service and in-service) views concerning technology integration. Besides, the other purpose is to identify to what degree there is a relationship between the digital literacy level of EFL teachers and applying technology effectively in teaching in Turkey throughout the period 2012-2022. Also, the study deploys gender impact on teachers' understanding and use of technology.

The researcher opted for the meta-analysis methodology to organize the study by investigating 20 articles to answer the 3 subsequent questions.

1-What are the teachers' perceptions of implementing technology in EFL teaching according to the studies conducted between 2012-2022 in Turkey?

2-To what extent do teachers have digital literacy and effectively use technology according to the studies conducted between 2012-2022 in Turkey?

3-Does gender have any significant impact on Turkish EFL teachers' perception of technology implementation or their digital literacy according to the studies performed between 2012-2022 in Turkey?

General Objective

The principal target of the study is to investigate EFL teachers' perceptions of using technology in the educational process in Turkey between 2012-2022 and determine their digital literacy and effectiveness of implementing various tools of technology as well as possible gender influence. The research has been performed by evaluating 20 academic articles that discussed the previously mentioned topics, using meta-analysis methodology.

Specific objectives

Three objectives have been assigned for the study as follows:

-The first objective is to evaluate EFL teachers' perceptions and attitudes towards implementing technology in teaching in Turkey during 2012-2022.

-The second one is to determine teachers' digital literacy and effectiveness of technology use in Turkey during the period 2012-2022.

-The third objective is to investigate the impact of gender on teachers' attitudes towards technology and on their digital literacy in Turkey during the period 2012-2022.

1.3 The Significance of the Research

The importance of the findings originates from both theoretical and practical perspectives. The results draw attention to some information and facts that the majority of the participants of the twenty articles that have been studied imply that technology integration is essential and necessary in Turkey. It also provides new and different perspectives for the instructors

who have chiefly believed that implementing technology is necessary. Hence, this research identifies some of the reported major perceptions and experiences of EFL teachers worldwide using plenty of technological tools and the ways they adapted their teaching to improve the learning and teaching environment.

This research is important and instrumental in surmounting some of these abrupt challenges of technology integration tendency in the last decade in Turkey for the following reasons. First, this study shows the teachers' attitudes towards integrating technology in the education process. Second, a considerable number of teachers have changed their views towards using technology especially after being trained or prepared to use it effectively. Third, technology has been the only safe solution to proceed with the educational process, especially during the emergency case of the pandemic. Fourth, the study attempts to discover and analyze how teachers have dealt and adapted themselves, the teaching process, to using the new and advanced technological tools in their own settings, via the analysis of studies conducted regarding these issues. Fifth, the research questions include uncovering any relation between gender and the perception and/or efficacy of technology use in teachers and candidate-teachers. Finally, the research demonstrates that technology plays a fundamental and inevitable role in the twenty first century and digital literacy has become one of the basic demands in the educational process.

1.4 Statement of Assumptions

This study reviews and collects data from 20 articles that have the tackled topics in common during a specific period of time and about the same country, Turkey. The collected data is believed to provide an overview of the recent situation, including the period between 2012 and 2022. The adopted methodology, meta-analysis is assumed to give a practical and useful strategy, considering the time and circumstances in which the study has been done. As a result, the collected and analyzed data may be significant and concrete in understanding and evaluating the situation in Turkey, especially that they were interpreted into numbers and percentages. Consequently, the gathered statistics of the evaluated situation can be the onset of a transformation phase, seeking solutions to the recent problems and elevating the educational technological tools and software at schools and colleges.

As long as technology has been affecting almost every aspect in our lives, education and educators are on the list, who are among the most essential elements in any society. Generally, educational institutions and educators are supposed to maintain professional development alongside the latest technological advancements. Therefore, it is completely vital that teachers assert a culture of tracing the most recent and novel technological evolution so that they sustain the continuous progress in their career. Lange (1990) defines teacher development as "a process of continual intellectual, experiential, and attitudinal growth of teachers" (p.250).

Numerous studies have been performed to assess the impact of deploying several technological tools in EFL/ESL teaching. Although this notion provides many advantageous opportunities to elevating teaching English, it still has some drawbacks. Nevertheless, the advantages absolutely outweigh the disadvantages. Hence, it is utterly crucial for teachers in Turkey to perceive the importance of these novel instruments and realize their potential impact on the educational process. Moreover, their capability of practically implementing and operating the latest devices and applications is a must for an attractive and influential teaching. Son (2018) discusses the importance of language instructors to observe how technology affects their teaching and their knowledge of CALL. Son also urges teachers to be innovative and ready to accept learning about the latest technological tools in order to achieve the fruitful technological integration into their educational and teaching strategies (p.18).

Therefore, this study will dive into the recent situation, describe, and assess teachers' theoretical and practical knowledge of digital literacy and tools. Unfortunately, in certain cases, not all teachers have equal access to technology, not even institutions. This was more obvious during the Covid-19 pandemic when all the educators and learners heavily relied on technology, in different ways and to different extents, to be able to resume learning and teaching; Turkey was not an exception. The aforementioned situation probably was an opportunity for the teachers to deeply understand how important technology in education is. Especially in those hard times, a generation's education would be totally lost without the aid of technology.

Suddenly in March 2020, English teachers were expected to work online and use a massive load of technological tools, applications and platforms without any anticipation

or preparation due to the COVID-19 pandemic. Başaran (2020) confirms that several nations had to close educational institutions because of concerns about safety and security and shifted to virtual teaching and learning. Also, Başaran (2020, p.8) asserts what UNESCO (2020) announced about the authorities, educators, and learners being unprepared for such a surprising shift to online classes. This shows the necessity and importance of technology and its dramatic demands to implement it in Turkey and worldwide. Even the educational institutions that previously were hesitant about this transformation found themselves obliged to completely move towards adopting and utilizing technological tools more prominently in their teaching methodologies. This research observes the importance of technology and its effects on learning and teaching modes in the time of crisis.

1.5 Statement of Limitations

The researcher attempted at collecting, analyzing, and investigating the maximum number of related articles written during the last 10 years. The number of the gathered articles was 20; therefore, a larger number of articles would increase the reliability and credibility of the collected results. Also, the collected articles investigated different types and levels of EFL teachers working at private and public schools, in addition to public and private universities in Turkey. This relatively wide variation in the participants makes the results general.

Further, the understanding of the process of technology integration in teaching, the usage of technological tools, and the ways or solutions to adapt to the twenty first century education have been rapidly changing among teachers of English, particularly during the pandemic phase nowadays. As a result, the gathered data from the last 2 years might differ from the data obtained from articles written 8 or 10 years ago. Finally, due to the recent pandemic, the research has been performed using meta-analysis methodology and because the researcher did not find a sufficient number or quality of participants at a particular workplace in order to collect data.

2. THEORETICAL FRAMEWORK

2.1 Overview

Technology, with all its rapid, massive, continuous, and changing models has become an integral and essential part in all aspects of life. Technology has proved its huge impact on the style of life and almost in every field worldwide. Thus, it is fundamental to consider and reconsider technology from different perspectives. This search deals with the relationship between technology and education, particularly, the teaching process. Ng et al. (2011, p.250) explain that the creative implementation of technology in education leads to promoting the teacher-student bonds, develops positive learning results, and consequently elevates the educational process. Also, Mishra, et al. (2007) assert that teachers' proficiency in terms of implementation of technology is highly associated with their teaching abilities; in other words, teachers who are good with technology are mostly qualified teachers. They also add that there is a tight link between their perceptions of integrating technology and their perception of the contexts of learning and teaching (p.13).

The research discusses the teachers' technological knowledge and the teachers' perceptions towards technology integration. Varghese and Mandal (2020, p.23) confirm that in order to achieve the technology integration target, it is necessary to fully comprehend its context, properly evaluate it, identify the needed technological tools, and finally plan in advance. In all cases, several obstacles may stand in the way of technology in classrooms, many of which are beyond teachers' control, like the presence and condition of computers, school technology policies, and the school day nature (Aworuwa et al, 2006).

2.2 Technology: Educational Technology, ICT, Technology Integration

Huang, R., et al. (2019) define Technology as "the practical and purposeful application of knowledge (a traditional definition linked to the etymology of the term from the Greek—*techné,* or skill, and *logos,* or reason); popular usage involves physical things as in smartphones, tablet computers, interactive whiteboards" (p.7). Huang, R., et al. (2019) define educational technology as "the use of tools, technologies, processes, procedures, resources, and strategies to improve learning experiences in a variety of settings, such as

formal learning, informal learning, non-formal learning, lifelong learning, learning on demand, workplace learning, and just-in-time learning" (p.4). They also add that educational technology is implementing and creating resources in order to promote the learning performance.

Spector & Ren (2015) affirm that educational technology extends through a relatively long history in supporting learning and teaching throughout various eras. Huang, R., et al. (2019) believe that the history of mankind can be divided into several eras, like primitive, agricultural, industrial, information period, and the recent phase of 'intelligent society' (p.10). Nonetheless, the notion of technology recently refers to the Internet, computers, smart-phones and others. A few years ago, the so-called concept of (new technologies) appeared. However, the generation of the day may consider the adjective (new), which was set in the past decade, an outdated concept. Probably, the term technology should be used as an international term that includes various developments in regard to this discipline. Carrio-Pastor (2016, p.22) argues that technology is no longer considered new; it is in fact normal phenomenon that is part of our life which is largely operated by machines.

Due to the fact that technology has a somewhat long history, the concept went through several stages, and achieved fundamental advancements. Warschauer and Meskill (2000) affirm that people implemented technological tools 40 or 50 years ago, such as recorders, projectors and boards. Ronau, et al. (2012, p.2) believe that the end of 1980s triggered a remarkable transformation in terms of the attitudes toward technology. Additionally, through the same decade of the 80s, the expression 'computer literacy' was quite popular, but at the beginning of the next decade the term 'information literacy' became more popular (Bawden, 2008).

According to Prensky (2001), the students who were born during and past 1980 are called 'digital natives' or 'millennials' (McMahon & Pospisil, 2005) as well as, according to (Oblinger & Oblinger, 2005), 'net-generation'. Ifenthaler & Hanewald (2014) describe these students as technologically educated and persistent utilizers of the internet who encircle their daily lives with technology, making it the core of constructing their relations (p.87). Hence, technology for such a generation has become an integral part of their lives, and probably part of their identity. "The real revolution of technology is to help our

students build relationships that extend our understanding of who they are on the planet" Alan November (2007). Similarly, Carrio-Pastor (2016, p.22) affirms that the tools which technology provides in video calling, blogs, videoconferencing, internet-based software and other social media applications and platforms have formed a tangible revolution; the latest advancements in communication have resulted in a revolution in relation to teaching.

Prensky (2001) distinguishes two types of digital people. He describes the young people or recent generation as 'Digital Natives', who are our students today. He describes the other type of older adults who were not born during this period as 'Digital Immigrants' because these immigrants have to get accustomed to the new atmosphere, where they keep something of their previous dialect, that reminds them of the past. (pp.1-2). According to the study done by Kamhi-Stein, technology natives can perform better as teachers than technology immigrants. That study revealed that effective implementation of technology by teachers suggests that they learn about it and use it as students. The efficient use of technology should not be restricted to a single subject or discipline if we want to prepare innovative and flexible implementation of technology by teachers (Kamhi-Stein, 2000, p.424).

Somekh and Davis (1997) shed light on the efficient implementation of technology by asserting that proficient information-based implementation of technology is learned through acquisition (p.21) and not a natural asset. Kosnik et al. (2016, p.149) consider that teachers' knowledge is continuously growing during this century, as several concepts of learning and teaching are dramatically changing. Ertmer et al. (2012) identify a couple of 'key barriers' that can affect technology implementation by teachers. The first type is *external* barriers, like access, support, and training. The second is *internal* barriers, like the knowledge and skills of teachers, and their attitudes in regard to the importance of technology.

Literature provides us with several broad definitions of telecommunication technology. The Ministry of Education (2002) in New Zealand announced that electronic learning is resilient about utilizing ICT instruments and programs, and concentrates on the interrelations among instructors, students and the virtual atmosphere of online classes (p.5).

2.3 Digital Literacy: TPACK, Technology integration

In relation to the history and definition of digital literacy, Belshaw (2012, pp.70-71) argues that the history of 'digital literacy' extends over a somewhat long time and is an evolving expression. We can spot its start in the late 1960s as an impression that the recent definitions of literacy neglected the visual element of media that the community offered at that time.

Due to the fact that there are many definitions made by numerous scholars of technological literacy, one prominent definition is by Selfe (1999, p.11) who believes that digital literacy constitutes a sophisticated collection of traditional and social customs and abilities that linguistically interact through the environment of electronic communication, including writing and reading. Another definition is being capable of using the contemporary systems while guaranteeing that the tasks are suitable and effective, and transform ideas and data into modern visions (Martin, 2008, p.158).

Other scholars included the Internet in their defections of digital literacy. For instance, Gilster (1997) identifies 'digital literacy' as being able to implement and interpret information in several forms and different computer sources, especially when presented by means of the internet (p.6). Lankshear & Knobel (2006) identify 'literacies' as the individuals' common methods of communication, production and management of meanings, by means of symbolic texts inside the setting of getting involved in the dialogue (p.64).

Martin (2008, p.167) identifies 'digital literacy' as the capability to operate digital devices and programs in order to be able to access, assess, analyze and build knowledge, understanding and communication with other individuals. Hence, we can clearly comprehend the immensely essential role of technologically educating the generation. In order for educational digital literacy to be useful and fruitful, it has to reflect the recent generation's cultural and social involvement in their digitalized community; their digital education should fulfill their identity structuring, personal expression of thought and engagement in such a virtual planet (Connolly & McGuinness, 2018, p.77). Peters (2009, p.4) adds that it is possible to implement digital technology and its potential international links for the sake of explaining to students who come from different cultures that this world in not mono-cultural, but in reality it is multi-cultural.

Ng (2012) affirms that digital literacy consists of three elements: (technical, cognitive and social-emotional). The technical aspect refers to having the necessary practical skills and software to implement ICT in the educational process. The cognitive side includes being able to think critically and digitally process information. The social-emotional dimension means possessing the correct attitude and responsibility to communicate, learn and preserve security to protect personal information (Ifenthaler and Hanewald, 2014, pp.86-87).

Keengwe & Onchwari (2020, p.80) identify the most essential 21st century career skills that are basically the four necessary capabilities, which are creativity, collaboration, critical thinking and communication, or the (4Cs). After all, reaching one specific and defined definition may be a complex task. Lankshear & Knobel (2008) claim that trying to formulate a comprehensive definition in relation to digital literacy definitely requires resolving the requirements of the huge number of real digital literacy notions (p.4).

There might be several challenges and factors that may impact students' online comprehension. Keengwe & Onchwari (2020, p.49) identify the most important elements in this issue or the two most challenging factors as establishing strong and updated internet connections and technology in addition to training educators on the effective technological integration into their classes. Voda et al. (2022) discuss the high significance of technological tools in education. They confirm that opting for the digital transformation seems quite challenging for educational institutions, because that requires developing the learners' digital capabilities. It is fundamental for these students to have these skills as they provide several advantageous digital choices (p.11).

Scholars in the field assert that teachers' pedagogy should lead technology, not vice-versa. Nichols (2003) states that the implementation of electronic instruments suggests reflecting the pedagogy of teaching rather than deciding it. Consequently, teacher training and adequate preparation can be a cornerstone in the process of effective digital education. Keengwe & Onchwari (2020, p.50) discuss that candidate-teachers and teachers during their service must be provided with suitable preparation, training courses and sources in case we want them to formulate and develop their thoughts, perceptions, efficiency, and educational integration of technology, and particularly research online abilities. Additionally, Shulman (1987) asserts that teacher knowledge should include

"Content knowledge, general pedagogical knowledge curriculum knowledge, pedagogical content knowledge, knowledge of learners, knowledge of educational contexts and knowledge of educational ends, purposes, and value."

Numerous researchers stress the idea of continuous enthusiastic growth and relentless pursuit of the latest and most advanced technological tools. Brooks-Young (2006, p.12) clarifies that the most efficient teachers who integrate technology in their educational practices never stop tracing the most modern technological tools and software. Actually, technology keeps advancing somewhat rapidly, and that fact may make it difficult for many users to keep full track of it. Therefore, it is necessary that some local government departments or offices provide free or probably cheap professional development sessions. Brooks-Young (2006, p.20) also adds that it is necessary for teachers to conceive the impact of their perceptions and attitudes toward technology as that can affect their practical efficiency of implementing educational technology in their classrooms.

In the published report by SouthEast Initiatives Regional Technology in Education Consortium (2001) under the title: Lessons Learned, which discussed the issues that can impact the efficient implementation of technology in the educational process, we can trace the following result: certain changes in teaching strategies result in effective technological implementation, and these teaching techniques can strongly motivate the integration of technology. Carrington & Robinson (2009, p.21) comment on this finding by confirming that teachers that implement technological tools in their classes efficiently, certainly modified their techniques by promoting the implementation of technology for achieving better learning. However, we have to remember that this process is not totally smooth and easy; actually, several aspects need to collaborate so that the desired results can be established. Byrom and Bingham (2001, p.9) believe that the technology-integrated educational process is not a rapid operation; rather it consumes a long time and demands a great deal of help and motivation for teachers.

Ng et al. (2011, p.269) explain that technology-based education targets making learning an easier task, and having sufficient knowledge of technology and digital tools is the primary procedure for the sake of achieving the objectives of a successful educational process. Probably all scholars and educators who are involved in TPACK issues agree that utilizing technology in teaching should be objective and creative with planned and

prepared catered pedagogical purposes. Mishra and Koehler (2006, p.1029) explain that by asserting that technology-based education does not suggest providing one digital solution that fits all educators, all subjects or all teaching techniques. The fine education suggests promoting deep knowledge about the sophisticated interaction among three factors: content, technology and pedagogy, and employing this knowledge in elevating definite techniques and methodologies.

Moreover, Kosnik et al. (2016, p.121) interpret that Technological Pedagogical Content Knowledge or 'TPACK' is benefited from by investigating how to correctly perceive teachers' theoretical and practical understanding of new technologies. Chapelle, C. A., (2003, p.31) supports the idea by asserting that in a career that requires sophisticated and complicated instructions and strategies, it has become essential for it to utilize technology with innovation and resilience. Pedagogical Content Knowledge PCK is identified by Marks (1990) as "a class of knowledge that is central to teachers' work and that would not typically be held by non-teaching subject matter experts or by teachers who know little of that subject" (p.9).

Teachers' knowledge of technology should not be isolated from their practical career demands. Mishra, et al. (2007, p.6) argue that it is imperative to put technological knowledge into its context. They also add that technology commonness in educational institutions demands that teachers foster a high perception of how technology is highly connected with their courses and teaching methodologies. At the same time Mishra, et al. (2007) distinguish three models of technological knowledge which are classified as follows: The first model is TCK which stands for (technological content knowledge) and represents the intersection of technological and content knowledge. Secondly, we have TPK, which stands for (technological pedagogical knowledge) and represents the overlapping zone between technological and pedagogical knowledge spaces. Thirdly, TPCK comes, which refers to (technological pedagogical content knowledge) and constitutes the common area among all the three parts (p.6). Mishra et al, (2007) provide their model of integrating technology in learning and teaching which suggests that all three major fountains of knowledge which are content, pedagogy and technology be carefully interlaced (p.8). See figure 1.

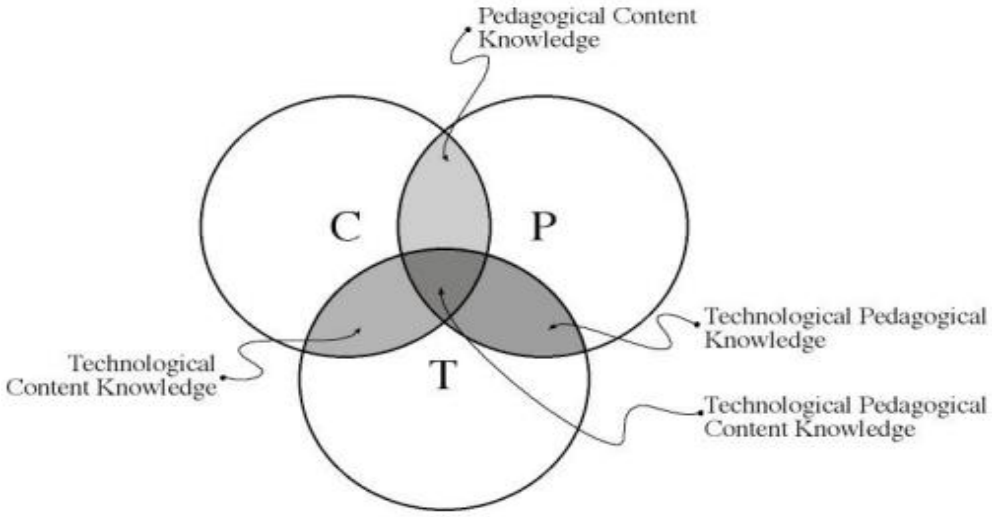


Figure 1. Mishra et al, (2007, p.9) model of integrating technology

Several institutions, scholars and committees proposed various models in regard to their understanding of digital literacy. The Joint Information Systems Committee (JISC) in England present their model of digital literacies which consists of 7 elements (Figure 2). According to JISC (2014) "digital literacies are essentially a set of academic and professional situated practices supported by diverse and changing technologies."

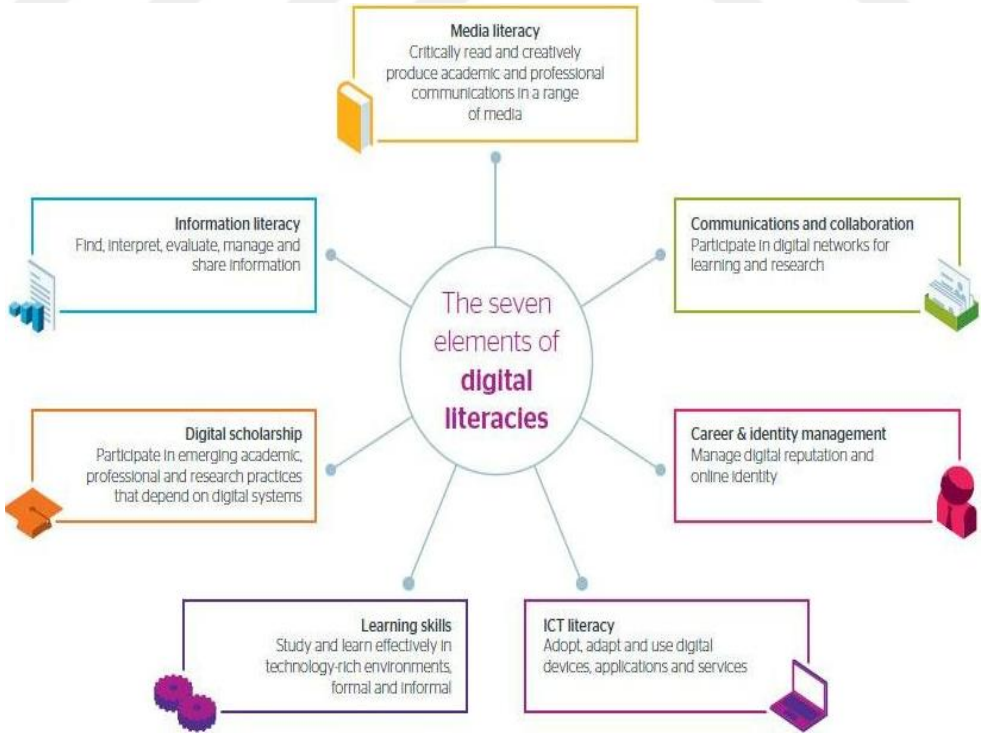


Figure 2.JISC (2014) digital literacy seven elements model

Another eminent model was presented by Payton and Hague (2010). Their model consists of 8 elements and focuses on educational contexts. See figure 3. This model was the base for several case studies that were conducted on primary and secondary schools.

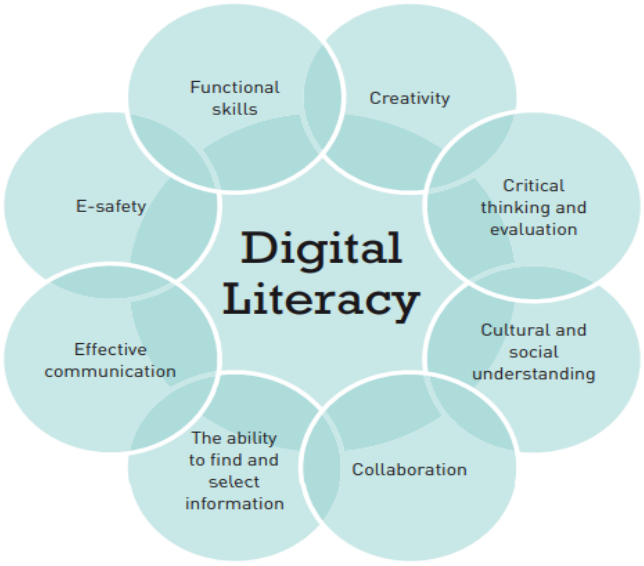


Figure 3. Payton and Hague's (2010) digital literacy model (p.6).

Payton & Hague (2010) stress that digital literacy can be developed across the curriculum which results in motivating and engaging students with the deployed technology. However, they also add that it is even more profound than that as the idea of digital literacy is to promote the recent generation's perception and understanding of the world around them, and encourage them to actively participate in the economic, cultural and intellectual aspects of life at the moment, as well as in the future.

Teaching techniques are being shifted from teacher-centered traditional practices which do not comply to the specific requirement and needs that students have in the current millennium (Lemoine et al., 2019) and the necessity for more contemporary methods is highly needed. The new century requirements are 'technology-driven' (Scheer et al., 2012). Keengwe and Onchwari (2020, p.143) discuss that the utilization of ICT (Information and Communication Technology) in education is fundamental as leads learning to happen more genuinely, and ICTs can cause the learners to strengthen their knowledge and even come up with new understanding. Moreover, students can benefit from this by solving the major challenges that occur in modern societies (UNESCO, 2011).

2.4 Teachers' Technological Knowledge: Teachers' Efficacy

Teacher competency in conceiving, having knowledge and practical skills about technology is a vital issue for a successful implementation in the educational process. Huang, R., et al. (2019) define competency as follows, "A competency is a collection of related knowledge, skills, and attitudes (KSAs) that enable a person to perform a particular task. There are many tasks that educational technologists perform as part of their role and responsibilities" (p.4).

Some scholars, such as Voda et al. (2022) discuss the relation between digital literacy and education, and the impact of the novel technological tools on learning and teaching. Voda et al. (2022, p.10) also add that digital language learning, pedagogical technologies and collaboration-based education, among others, constitute examples of the interaction between digital literacies and the latest media, which creates educational atmospheres. Ng et al. (2011, p.249) explain that exhibiting technological proficiency skills is crucial for teachers for the sake of fulfilling the different learners' needs.

2.5 Teachers' Perception: Attitudes, Beliefs, Self-efficacy

The Perception or the attitude towards any matter is considered as a key to comprehend and deal with any case appropriately. Thus, it is essential to know what perception may imply. Huang, R., et al. (2019, p.5) assert that perceptions and values are crucial in motivation, which is crucial to achieving successful missions, specifically fundamental in the field of educational technology. Similarly, Whyte (2015, p.17) confirms the importance of investigating teachers' attitudes, and believes that educators' readiness to deploy modern teaching techniques and methodologies, the way they integrate the latest technologies totally rely on their views and perceptions of the way students learn a language and the most efficient way to teach it. Additionally, Huang, R., et al. (2019) define 'attitude' as an intellectual tendency or thinking manner about a person or object, and this attitude is closely connected to specific 'believers' and to their readiness to get involved in specific tasks (p.6).

Bandura & Wood (1989) identify operative self-efficacy as a productive ability to consistently administrate changing situations while employing several skills (p.805).

Also, Bandura (1993) defines self-efficacy perceptions as the individuals' understanding of their own capacities to take control of the incidents that can impact their lives (p.118).

2.6 Gender

Several studies and experiments have aimed at investigating the role of gender, among other factors such as age, on the user's perception and efficacy of understanding and using technology. A number of studies concluded that there is little difference in perception and efficacy of technology use in favor of males. It is necessary to put these studies in their context of time and place so that we can better understand the reasons behind those findings. Morris, et al. (2005, p.73) explain that age and sex influence the link between the beliefs about the implementation of technology and the behavioral conception of technology, and that gender gap in the importance of perception will become more obvious as age expands. Jackson et al. (2008) conclude that female users utilize phones more frequently than males (p.440).

Some studies relate that to the nature of someone's gender in terms of the possibility to be influenced and the type of response to those external elements. Venkatesh and Morris (2000, p.119) say that investigating the differences in terms of gender is a subjective issue and results in understanding to what extent males or females can be affected, and to what degree they interact with data that are offered by elements. Venkatesh and Morris (2000) add that additional factors, such as experience, may affect one's intentions and opinions about an issue. Considering the role of experience sounds vital in this context and experience can significantly impact someone's beliefs of view about an issue (p.121-122). Volman and Van Eck (2001, p.626) demonstrate that their research, which utilized a meta-analysis of 19 American articles, concluded that there was not significant difference regarding gender in respect to computer literacy. Rather, the differences more obviously seemed to be linked to computer *experience*. In short, users who use computers more frequently demonstrated higher level.

Other studies resulted in more factors that may influence a person's responses, and may keep these reflections in continuous change, especially job requirements. Morris, et al. (2005) argue that perceptions and views of the importance of technology at work, in terms of gender, change according to job requirements as well as with increasing age (p.73).

Other scholars added that leisure time can constitute a gender gap as well (Green, 2000; Kelsey, 2002).

Additional studies focused on particular aspects of technology that may interest women more than men, such as communication. Such prediction may lead to formulate expectations that can be true according to the findings of their studies, and further will lead to 'expectancy hypotheses'. Brown et al. (2010) concluded to the following: age, experience and gender leave their expected impact on altering the perception of using collaborative technology, and especially experience leaves the highest influence on older females who have less experience (p.16). The same notion had been previously established by Gilligan (1982, p.616): in regard to gender-based differences that are related to communication and contacting other individuals, the results are in favor of females. On the other hand, other studies were in favor of males, especially in relation to games. Ritzhaupt et al. (2013, p.300) talk about the gender issue in terms of the possible difference regarding using technology and confirm that males may have a higher competence level in other usages of ICT, like video games.

Volman & Van Eck (2001) affirm that certain studies still confirm the presence of a gender-based difference in relation to the ability to reach and use computers at some educational units, and according to those studies, they attribute that difference to age and they argue that this observed difference has been disappearing (p.617). However, numerous studies concluded that there is no significant difference or no difference at all in terms of gender difference in online or technological activities.

The collected findings in this study support this claim with the vast majority (as indicated in data findings chapter). One possible reason might be the time in which the studies have been conducted; probably the more recent studies tend to show this result, of no gender difference, among other factors such as the society and local traditions, the participants' educational level, their social class, race, income and age. To sum up, gender influence on technological and digital capabilities has been declining, and almost disappearing, especially recently.

2.7 Professional Development

Teacher professional development is one of the pillars of the teaching career. Teachers' participation in professional development programs and continuous training sessions is essential to achieve better understanding of how to effectively perform in their courses (Blackley & Sheffield, 2015). Teachers of the twenty first century are required to be prepared to handle technological tools and applications so that they can inspire their students to be able to have the required lingual skills. In addition, this situation may help learners to even create competent tools in the future. Koehler, et al (2013) mention that teachers' experience is usually insufficient when it comes to technological educational knowledge, because those instructors became teachers when technology had a much lower level of advancement compared with today (p.14).

Other scholars even discussed promoting 'design thinking' for teachers in regard to their technological practices. These scholars believe that making teachers' views part of the design of educational technological tools may be an advantageous addition. Teachers, as well as students, are no longer isolated from the educational process which can highly benefit from integrating their innovative ideas into planning and designing its materials. Keengwe & Onchwari (2020, p.85) claim that the impact of applying design thinking strategy onto technological professional development integration programs will be positive on the learning process. The National Research Council (2007) affirms that "Online professional development, when it is done well, has the opportunity to change teachers' practice" (p.10). Furthermore, Buabeng-Andoh (2012, p.142) explains that the most essential element to achieve fruitful technological integration into teachers' learning and teaching techniques is their professional development. Professional development experiences may be more practically associated with additional insights and creative initiatives for teaching and learning, facilitated by the presence of technology, instead of the development of user competency in using of some applications and devices (EDC, 1996).

Consequently, many educators and institutions reconsidered the extreme importance of teacher professional development, and explained its main purposes, among which is elevating human capacities. According to the Education Development Center EDC (1996, p.8) professional development is not considered training about technology itself, but

rather it is the preparation to offer, support, promote and evaluate the learners' learning process and needs. In the year of 2016, The U. S. Department of Education (U.S. DOE) hosted discussions which specified challenges and provided guidance to programs that aim at preparing teachers to better integrate technology acquisition and competence into the curriculum (U.S. DOE, 2016).

3. METHODOLOGY

3.1 Introduction

This section examines previous inquisition in respect to the teachers' perceptions of technology utilization in English language teaching, and recognizing the importance of the 21st century skills, particularly, digital literacy. Also, the study investigates the effectiveness of the implementation of that technology in the educational process, as well as any possible gender effects on the theme.

The research involves a systematic investigation based upon precise criteria. As a result, this paper tackles studies that carry similar circumstances in Turkey. The motive for using a meta-analysis is to make a comparison among these studies to better understand and recognize the attitudes of English language teachers towards the importance of having enough digital literacy skills and implementing them effectively to improve the curriculum and the teachers' competence as well.

Cheung (2015, p.1) claims that Pearson (1904) is recognized among the first scholars who deployed the meta-analysis criteria. National Research Council (1992) and Hunt (1997) are among the examples of several successful studies that have been recorded. The expression *meta-analysis* is believed to be created by Gene Glass in the psychological field to refer to "the statistical analysis of a large collection of analysis results from individual studies for the purpose of integrating the findings (Glass, 1976, p.3). Borenstein et al. (2009, p.11) add that meta-analysis offers the possibility to conjoin the effects, and then assess the statistical value of the overall influence.

Cheung (2015, p.2) outlines how the meta-analysis is usually run in several social, medical and educational studies. The start is identifying practical and measurable research questions related to present studies that should provide enough numbers, information and figures that can be calculated and to identify the effect size. There should also be clear and precise *inclusion and exclusion* standards. Next, the collected data is transformed to a statistical analysis, and finally the findings and results are interpreted and explained in reports that can be published and shared.

3.2 The Research Methods

This study analyzes 20 articles that were written during 2012-2022 in relation to our research questions. Meta-analysis is adopted in collecting, studying and analyzing data. One more definition of meta-analysis is "a set of statistical methods for combining quantitative results from multiple studies to produce an overall summary of empirical knowledge on a given topic" (Littel, H. et al, 2008, pp.1-2). Noteworthy, Erwin, Brotherson and Summers differentiate between Meta-analysis and Meta-synthesis by suggesting that meta-synthesis demonstrates qualitative results research data, unlike meta-analysis which investigates and clarifies interference of statistical quantitative data. Erwin et al. (2011, p.189) add the purpose of a meta-synthesis does not suggest providing a brief outline of the results or repeating them, as it is the case in meta-analysis. It is in fact to understand and digest the results. In reality, they believe that the main intention of meta-analysis is to identify the (cause and effect inferences).

3.3 Procedure

The procedure is done via meta-analysis methodology. The data have been collected over two months and analyzed attentively. The meta-analysis method has been done by reviewing 20 articles in Turkey between 2012-2022. The participants are English teachers who work at different public and private institutions, and have diverse teaching experience years. They largely provided answers to three questions which were the questions of the research.

Inclusion and Exclusion Criteria

In this research, 20 articles have been analyzed in terms of EFL teachers' views, their implementation of technology and their level of knowledge in digital literacy skills in Turkey. All the 20 studies were conducted during the last 10 years throughout the period (2012-2022). Besides, the studies were carried out for EFL teachers teaching students of different ages and levels in Turkey.

The inclusion criteria are created as follows:

• The study has been conducted in the last 10 years between 2012 and 2022 in Turkey.

• The selected 20 articles were chosen on basis of answering all the three research questions.

• The study examines the teachers' literacy, knowledge and skills and their attitudes towards technology in teaching.

• The participants have been in-service and pre-service teachers of EFL.

• The dependent variable determines the teachers' effectiveness of using technology in teaching.

• The study is about teachers, so articles that investigated both teachers and students were included, analyzing only the teachers' data.

The exclusion criteria:

- Articles written outside the last 10 years, before 2012, were not selected.
- Studies performed in other countries than Turkey were not selected.
- Articles that investigated other topics than language teaching were not considered.
- The study is about teachers in the first place; therefore, articles about students only were not selected.

3.4 The Data Collection Tools

The selected articles

Here is a brief review of all the 20 articles that were selected in order to help us conduct the research and gather data related to the questions of research. Each review includes the article title, author, year of publication, participants, research questions, methodology, data, and findings. The articles are attached in the appendices.

Article 1: *Perceptions of In-Service Teachers Regarding Technology Integrated English Language Teaching* by Sağlam, A. & Sert, S. (2012).

The study was held in Istanbul including 27 in-service language instructors at an EFL preparatory school. The authors did not specify how many male and female teachers were involved. The paper aimed at investigating 6 research questions:

What is/are:

1. Teachers' views of students' understanding in technology integrated ELT?
2. Teachers' definition of technology?
3. Teachers' perception of technology use?
4. Teachers' rationale of integrating technology?
5. Teachers' responses related to advantages and disadvantages of ICT?
6. Teachers' responses related to institution's approach?

The data were collected following 3 instruments: interviews, open-ended questionnaire and field notes. The findings indicate a remarkably positive perception of technology integration. Also, the participants demonstrated a high awareness of the advantages and disadvantages of technology use. They generally believe that implementing technology is motivating and knowledge building. Finally, the study found that institutional policies affected the participants' positive attitudes.

Article 2: Prospective EFL teachers' perceptions of ICT integration: A study of distance higher education in Turkey by Hismanoglu, M. (2012).

This article investigates Information & Communication Technology or (ICT) and distance learning in Turkey. The participants are 85 in-service EFL distance higher education teachers (23 male and 62 female). The study included 3 research questions which are:

1. What obstructs your positive perceptions toward ICT integration?

2. Do you think that learning ICT use at a distance is a disadvantage?

3. What do you suggest to better learn how to integrate ICT?

The data were collected through questionnaires and interviews. Next, the data analysis deployed the Statistical Package and descriptive statistics. The findings revealed that the participants were not confident enough to deploy technology in elevating their teaching quality. Also, many of them did not have enough training regarding computer basic skills. Moreover, the study revealed that despite the teachers' negative attitude towards

technology, they still believe that it is a productive tool in teaching. Finally, the paper reached a conclusion that professional training is necessary to enable teachers to meaningfully integrate ICT in teaching methods.

Article 3: *Turkish and English Language Teacher Candidates' Perceived Computer Self-efficacy and Attitudes Toward Computer* by Adalier, A. (2012).

This article focuses on the examined teacher-candidates' attitudes and perceptions of computer implementation in teaching. It also investigates their responses according to several variables according to their (major, sex, age, English competency, social and economic parameters). The participants are 136 pre-service teachers of English and Turkish (58 male and 78 female). The two research questions are as follows:

1. Is there any statistical difference between Turkish and English language teacher candidates' "Perceived Computer Self-Efficacy" and their "Attitudes Toward Computer"?

2. Is there a statistically significant relation between Turkish and English language teacher candidates' "Perceived Computer Self-Efficacy" and their "Attitudes toward Computer"?

The data were collected through 3 instruments: demographic information form, computer perceived-efficiency scale, and attitude of computer scale. The analyzed data revealed the following findings: a noticeable gap between Turkish and English language candidate-teachers and their computer efficacy was observed in terms of their age, department, social and economic factors, and proficiency level of English. On the other hand, there is no meaningful difference regarding gender.

Article 4: *Pre-Service ELT Teachers' Attitudes Towards Computer Use: A Turkish* Survey by Sarıçoban, A. (2013).

This article studies the perception and views of student-teachers in regard to the use of computer. It measures the elements that impact teacher's efficiency, perception, control and responses and behavioral reactions. The participants are 95 teacher candidates in ELT, in addition to social studies fields. There were 13 male participants, and 82 females. The research aims at answering these three questions:

1. How does each sub-attitude towards the use of computers affect students' overall attitude towards computer use?

2. Do personal variables such as age, gender, subject domain, and computer education have any effect on teachers' attitudes towards computer use?

3. Is there any difference between educational types in relation to attitudes towards computer use?

The data were collected through a survey which consisted of a couple of divisions. The first is related to the participants' demographic data, which is extended to their computer knowledge, age, and sex. The next section involved completing a Computer Attitude Scale. The findings revealed that the participants' views of computers were highly positive with powerful feelings. The study also concluded to idea that the participants expressed a satisfactory level in relation to implementing computers. This research did not register any significant link between learning computer and gender. However, the study revealed that a noticeable connection between the user's age and general views of computers was observed (younger participants are reported to be more positive).

Article 5: *Pre-service English teachers' perceptions of web-based assessment in a* pedagogical content knowledge course by Öz, H. (2014).

This research studies the attitudes of candidate-teachers about the assessment that is web-based and related to a course they had about pedagogical content knowledge at a public university. The participants are 50 pre-service teachers (9 male and 41 female).

The paper tackles these four questions:

1. What are the pre-service English teachers' general perceptions of web-based testing for their course?

2. Do the pre-service English teachers prefer computer-based tests over paper-based tests?

3. Do gender, duration and frequency of internet usage and level of computer literacy affect the pre-service English teachers' perceptions of web-based assessment?

4. Does the pre-service English teachers' intention towards web-based assessment relate to (a) perceived usefulness, (b) perceived ease of use, (c) computer attitude, and (d) anxiety?

Data collection instruments that were applied in this research include an online questionnaire using SPSS, and an interview. The findings show that teachers' perceptions towards web-based testing are basically positive. Also, it demonstrated that a small number of the pre-service teachers opted for computerized assessment rather than assessments on paper. Gender is reported to be essentially associated with the usage of the internet and technological literacy (male participants generally have higher levels of computer literacy). Nevertheless, the general perception does not record a significant gap between female and male participants. Finally, the data confirmed significant relations between the ease of use, attitude, anxiety and the learners' practical conduct in respect to online testing.

Article 6: *Teachers' Views on Digital Educational Tools in English Language Learning: Benefits and Challenges in the Turkish Context* by Çelik, S. & Aytın, K. (2014).

This study aimed at investigating teachers' digital literacy, attitude toward technology and level of competence. The participants are 71 state school teachers including undefined numbers of males and females. The study has 4 research questions that are:

1. How do Turkish EFL teachers perceive the use of digital technologies in foreign language instruction?

2. In their eyes, how does the English language teaching curriculum provide for the use of technological tools?

3. How do English language teachers view the availability of digital instructional resources?

4. What are their perceptions concerning their own level of digital literacy; i.e., do they feel that they have the level of confidence and competence needed to effectively apply digital learning tools in their teaching?

A number of personal interviews were performed with the study population in order to gather data. The interview questions were categorized into main and secondary divisions

according to the participants' descriptions of their attitudes. The findings concluded that the general perceptions of the teacher participants optimistic and excited. They also confirmed that technological instruments encourage the learners and promotes their performance with the pass of time. However, the teachers announced that inadequate reach to technological instruments was the essential element that restrained their use of digital tools in their classes, rather than their insufficient digital literacy. In all cases, they believe that they are confident to learn the necessary skills by themselves.

Article 7: *Investigating Turkish Pre-service Teachers' Perceptions of Blogs: Implications for the FATIH Project* by Ocak, M., Gökçearslan, Ş. & Solmaz, E. (2014).

This paper attempts to uncover the views of pre-service teachers in relation to implementing blogs in ICT integration, as a part of the FATIH project and to investigate any advantages that deploying blogs might result in. The participants are 174 student teachers of several departments at Gazi University (45 male and 129 female).

The following 4 questions of research were addressed in this paper:

1. What are the perceptions of the Turkish pre-service teachers about the educational use of blogs with regard to ICT integration in the FATIH project?
2. What are the perceptions of the Turkish pre-service teachers about future benefits of blogs with regard to ICT integration in the FATIH project?
3. Is there a significant difference between male and female pre-service teachers' perceptions towards the educational use of blogs?
4. Is there a significant difference between male and female pre-service teachers' perceptions on future benefits of blogs?

An online survey was adopted in order to gather the data. It was conducted in the classroom. The survey has 3 sections: the first part involves demographic data. The second part was about pre-service teachers' views of the educational utilization of blogs. Finally, the third part addressed the pre-service teachers' perceptions in respect to future fruitful results of blog implementation in teaching. The findings asserted that the pre-service teachers believe that using blogs in teaching positively supported the learning process, promoted the learners' participation in the classes, improved and elevated

motivation in different skills. Although many teachers may not tend to use blogs for personal purposes, they still might need to use them for the sake of achieving a noticeable shift in their educational productivity.

Article 8: *Tracing preservice English language teachers' perceived TPACK in sophomore, junior, and senior levels* by Turgut, Y. (2017).

This article describes the recent situation of the conceived TPACK progress of student teachers who are at their 4th year at an ELT course. The participants are 174 pre-service teachers at a public faculty in Turkey. The article does not specify their numbers by gender. The study involved two research questions:

1. Does the self-perceived development of PTs' TPACK skills follow an increasing linear pattern through sophomore, junior, and senior years as planned in ELT curriculum?

2. From PTs' perspective, how does the TEI curriculum prepare PTs for the integration of ICT?

A TPACK questionnaire was deployed to collect data. This questionnaire involved all the seven items related to TPACK knowledge. It additionally concentrated on the participants' attitudes towards their university model of TPACK through open-ended questions. The results in general indicate that the TPACK notion proved helpful in respect to elevating the pre-service teachers' self-confidence and technology-integrated productivity as the years pass by. Unfortunately, the study revealed that the training teachers did not offer a satisfactory integrated technological modeling for the examined pre-service teachers.

Article 9: *Perceptions of Turkish Pre-Service EFL Teachers on Their Technological Pedagogical Content Knowledge* by İşler C. & Yıldırım, O. (2018).

In this article, the Turkish candidate-teacher's attitudes and levels of TPACK were questioned. Also, the paper investigated the elements that can impact their views about TPACK, as well as their thoughts about integrating technology into their courses. Of the 94 participants, there were 78 or (83%) female and 16 or (17%) male, and their average age was 22.4 years. Two research questions were targeted to be answered:

1. What is the level of a group of Turkish pre-service EFL teachers' technological pedagogical content knowledge?
2. What are the perceptions of a group of Turkish pre-service EFL teachers on their technological pedagogical content knowledge?

This research applied quantitative as well as qualitative methods to collect data and employed data analysis procedures. For collecting data, two questionnaires were designed to collect data related to the participants' responses in relation to their technology integration, pedagogical practices, and knowledge of the content. In addition, a number of the participants, six, conducted an interview about their attitudes of TPACK competency and their understanding of using technology in teaching English. Considering the quantitative data, the findings demonstrated that their views of TPACK efficacy were high. As for the analyzed qualitative results, the data similarly promoted an advanced level of high TPACK efficacy.

Article 10: *The investigation of the relationship between Turkish EFL teachers' technological pedagogical content knowledge skills and attitudes towards technology* by Kozikoğlu, I. & Babacan, N. (2019).

This study investigates the connection that links the TPACK skills of teachers of English and their views about technology in Turkey. Its participants are 712 EFL Turkish teachers (105 male and 616 female), 447 of them received Fatih project training. Three research questions are assigned for this research:

1. What is the level of Turkish EFL teachers' TPACK skills and attitudes towards technology?

2. Do Turkish EFL teachers' TPACK skills and attitudes towards technology differ significantly according to gender, Fatih project training and professional experience?

3. Is there a significant relationship between the Turkish EFL teachers' TPACK skills and their attitudes towards technology?

Attitude scale TPACK and technology was implemented to collect data through Google Forms. The findings revealed that the participating EFL teachers' TPACK skills are significantly competent as well as their perception of technology. Additionally, the data

revealed that Turkish EFL instructors enjoy an advanced level of TPACK usage abilities and they also look positively at the implementation of technology. Finally, the research concluded that, in terms of gender, no noticeable difference was observed in relation to the teachers' views of technology. However, the study also showed that male teachers possessed a more advanced level of TPACK abilities than female instructors.

Article 11: *EFL Students and Instructors' Perceptions on How Digital Literacy is Perceived in the Turkish Context: A Qualitative Study* by Yukselir, C. & Yuvayapan, F. (2019).

This research investigates EFL learners and teachers' beliefs about digital literacy in order to question their attitudes of implementing technological instruments in teaching English. The participating population consists of 136 university students, who are studying in different departments in addition to 27 EFL instructors (20 female and 7 male) working in the same university. This study aims at answering the following questions of research:

1. What are the perceptions of EFL students about digital literacy in higher education?
2. What are the perceptions of EFL instructors about digital literacy in higher education?
3. What are the similarities and differences between EFL students and EFL instructors regarding their perceptions of digital literacy?

Open-ended survey questions were implemented to collect data. Content analysis was used to make inferences from the collected data. The findings suggested that each of EFL students and teachers' beliefs about digital literacy was involved in different aspects. Another finding asserted that both of the learners and teachers should be prepared and trained in their digital literacy so that they can promote the educational learning and teaching process and make the technologically-integrated classes smoother. Finally, teachers declared their reluctance to adopt the digital transformation integration into their classrooms because of the inappropriate or unsatisfactory technological knowledge.

Article 12: *Pre-service ELT teachers' beliefs and perceptions on 21st century learning and innovation skills (4Cs)* by Bedir, H. (2019).

This paper researches candidate-teachers' views about educational and creative abilities focusing on the 4Cs (creative thinking, critical thinking, collaboration and communication) skills. The participants are 124 candidate-teachers with their ages ranging from 22 to 24, (27 were male and 97 were female). The three questions of investigation are as the following:

1. What are EFL pre-service teachers' general perceptions on 21st century learning and skills?

2. What are EFL pre-service teachers' specific perceptions towards 21st century learning and skills (4Cs)?

3. What are the EFL pre-service teachers' specific beliefs toward the integration of the 4Cs in the following aspects? A. National curriculum and instruction B. assessment C. professional development.

The data collection method deployed a survey with close-ended and open-ended items (17), in addition to an interview. The findings concluded that that pre-service teachers were mainly positive about the technological integration into their teaching strategies. Also, the teachers partially recognized 4Cs. However, their beliefs about 4Cs were highly positive. Further, Pre-service teachers expressed negative impression regarding the value of 4Cs in the school courses, but their views were positive in relation to professional development.

Article 13: *Exploring Turkish Pre-Service Teachers' Perceptions and Views of Digital Literacy* by Ata, R. & Yıldırım, K. (2019).

This paper studies the perceptions of candidate-teachers in respect to digital literacy and the characteristics of their digital abilities at a public faculty in Turkey. The participants are 295 pre-service teachers (102 male and 193 female) at several majors.

The research questions go as follows:

1. What are the digital literacy levels of pre-service teachers?

2. What perceptions do pre-service teachers have about digital literacy?

3. Do pre-service teachers' digital literacy perceptions vary by their demographics?

4. To what extent are the quantitative results on pre-service teachers' digital literacy perceptions in line with the pre-service teachers' views of factors affecting the development of digital literacy skills?

A digital literacy scale and open-ended questionnaire were conducted. Many tests and statistical methods have been employed in order to process and analyze the gathered data. The findings revealed that the perceptions of male undergraduates about digital literacy were remarkably higher as well as their majors, which were in favor of science. Also, it was found that the participants' perceptions and attitudes towards digital literacy widely vary and are remarkably related to the frequency of their use of the internet.

Article 14: *Exploring Turkish EFL teachers' perceptions of the factors affecting technology integration: A case study* by Önalan, O. & Kurt, G. (2020).

This case study investigates any factors that can influence instructors' integration of technology procedures or understanding of software, computer habits, views about their confidence when using computer-integrated teaching, and their conception of a positive classroom environment. The participants were 70 (19 male and 51 female) EFL teachers with various years of experience and different educational levels. The following research questions were discussed:

1. How do Turkish EFL teachers perceive their knowledge about computer software?

2. What are the personal computer use habits of Turkish EFL teachers?

3. What are the attitudes of Turkish EFL instructors toward using computers for teaching and learning purposes?

4. How do Turkish EFL teachers perceive their self-confidence in integrating computers into their teaching?

5. How do Turkish EFL teachers perceive the school climate and support in relation to the use of computers for instruction

The data collection method adopted analyzing a survey that was translated into Turkish. The findings demonstrated that teachers have good knowledge about the popular

programs, and they express positive views of implementing technology in language classes, and their self-confidence is high in respect to technological integration into the educational process.

Article 15: *EFL Teachers' Views about Technology Integration in English Language Teaching: A Case Study* by Canbay, F. (2020).

This article questions English teachers' understanding of the integration of technology into EFL teaching. The participating population is made of 9 English teachers who are employed at a high school (1 male and 8 female). The research aimed at investigating the following questions:

1. What is the EFL teachers' level of technology, pedagogy and content knowledge (TPACK)?
2. What are the EFL teachers' expectations and opinions towards using technology in language education?
3. What are the EFL teachers' practices about using technology in teaching English?
4. How does technology integration affect the in and out of class tasks given by the EFL teachers?
5. How does in-service training affect the EFL teachers' opinions and knowledge of technology, pedagogy and content?

The data which were gained from a written interview and the TPACK-EFL survey with 10 open-ended questions were analyzed through SPSS. The research concluded to the results that the teachers' attitudes were positive about technology integration in teaching English. Moreover, the participating teachers implemented technology in their pedagogical practices. They also believed that technology remarkably impacts language educational process. The research concluded that the participants were confident in regard to integration of technology as well as their own attitudes, although they needed to develop certain elements.

Article 16: *Is Technology in Our Classrooms? EFL Teachers' Beliefs and Engagement with Technology in the Classroom* by Hol, D. & Aydın, I. (2020).

This article questions Turkish EFL instructors' views in respect to using digital tools in their teaching strategies, and the potential elements that may impact their understanding. The participants in this research are 563 (133 male teachers and 430 females) Turkish teachers employed at public and private schools or faculties across Turkey. They have different levels of education and years of experience. This article aims to discuss the preceding research questions:

1. What are the beliefs of EFL teachers about the use of digital technology in the classroom?
2. What are the factors affecting the beliefs of EFL teachers?

The investigation conducted quantitative method in order to gather data via a survey about the participants' beliefs. The analyzed data concluded that the participants' views of digital technology implementation were positive in respect to expertise, use, importance and context. Further, the results demonstrated that age, teaching experience year and gender left no significant influence on teachers' views.

Article 17: *Digital literacy practices of Turkish pre-service EFL teachers* by Akayoğlu et al. (2020).

This study dived into Turkish pre-service teachers' conceptualization of digital literacy. Also, it explored their definition of this notion, the instruments they operated, and objectives for which they deployed digital instruments and tools. The participants in this investigation are 133 students from the disciplines of languages at 3 faculties (21 male and 92 female). The preceding questions were addressed:

1. What does the term digital literacies mean for pre-service English language teachers?
2. What digital tools do pre-service English language teachers use?
3. For what specific purposes do PTs use digital tools in teaching English?

A qualitative research design was applied to collect data through an open-ended questionnaire. The study found that the participants defined 'digital literacy' in various ways. They obviously believed that they are proficient to implement technological

instruments for numerous personal and professional objectives. Additionally, many of them seemed to be doubtless about their high competence in terms of digital literacy.

Article 18: *Turkish EFL Teachers' Attitudes Towards Online Instruction Throughout the Covid-19 Outbreak* by Civelek, M., Toplu, I., and Uzun, L. (2021).

The target of this paper is to research the attitudes of EFL instructors in Turkey in regard to online instruction or (OI), the effect of training on those perceptions, the problems they face, and the possible techniques that can lead to better delivery of OI during the Covid-19 pandemic. In fact, 70 teachers (18 male and 52 female) participated in this study. The purpose is to answer these four research questions:

1. What are the attitudes of Turkish EFL teachers, who had the experience of DE throughout the Covid-19 outbreak, towards OI?

2. Is there a significant difference between the attitudes of Turkish EFL teachers who had learned about implementing OI during their academic studies and the ones who hadn't?

3. What are the opinions of Turkish EFL teachers, who had the experience of DE throughout the Covid-19 outbreak, on the obstacles of OI?

4. What are the perceptions of Turkish EFL teachers, who had the experience of DE throughout the Covid-19 outbreak, on the strategies that should be employed for the integration of OI in Turkey?

The paper implemented semi-structured interviews and a questionnaire in order to collect the data. SPSS 26 was adopted to analyze the collected data. Further, 10 of the participants that expressed negative perceptions of OI participated in the interview. The research concluded that OI throughout the Covid-19 pandemic is not that positive, compared to the outcomes of other studies. When analyzing the interview results, the study affirmed that English teachers did not express a sense of confidence for performing effective OI as their knowledge about it is inadequate and their capabilities are insufficient. Finally, considering the teachers' attitudes toward more efficient implementation of technological OI in English classes, the participants indicated that they do not support the idea of replacing in-person classes with virtual classes.

Article 19: Integration *of Technology in EFL Classrooms: Turkish Teachers' Perceptions and Proficiency Levels* by Valizadeh, M. (2021).

This research investigates Turkish EFL teachers' level of technological use competence, their attitudes towards technological integration, and the utilization of technology in virtual education amid the Covid-19 outbreak. As for the participants, they are 159 EFL in-service teachers in Turkey (52 male and 107 female). As a result, this article aims at answering these three research questions:

1. What is the Turkish EFL online teachers' level of technology proficiency?

2. What are the Turkish EFL online teachers' perceptions and views of technology?

3. How do the Turkish EFL online teachers implement technology in their online classes?

The research applied Likert-scale questionnaire for collecting data. This questionnaire contained two types of items, open-ended and close-ended questions. The researcher calculated the open-ended items responses by their percentages, frequency and according to their topics for the sake of analyzing the quantitative data. The findings indicate that Turkish English teachers' attitudes toward technology are positive in general. A major part of the participants affirmed that they are capable of implementing and integrating technology in the form of instructional instrument into their virtual teaching. However, the findings asserted the idea that higher education teachers did not seem well-prepared for performing adequate online teaching. The recent situation of EFL teachers in Turkey appears to be satisfactory in regard to their technological competence and views about effective technological implementation during their online teaching.

Article 20: *An in-depth Look into Perceived Technology Proficiency of Turkish Teachers of English and their Technology Practices* by Erdin, Y. & Uzun, L. (2022).

This research investigates how Turkish teachers of English deal with technology, and if such variables as their sex, age, the level they instruct, whether they teach at a private or state institution, teaching years of experience, and the time they work in technological surroundings impact their digital competency. The participants are 273 (59 male and 214

female) in-service teachers with different levels, institutions, years of experience among other variables. The study identified the following questions:

Is there a meaningful relationship between:

1. the sex of Turkish teachers of English and their perceived technology proficiency?

2. age of Turkish teachers of English and their perceived technology proficiency?

3. the level Turkish teachers of English teach and their perceived technology proficiency?

4. whether Turkish teachers of English teach at a state or a private institution and their perceived technology proficiency?

5. years of teaching experience of Turkish teachers of English and their perceived technology proficiency?

6. How much time Turkish teachers of English spend in technological environments and their perceived technology proficiency?

The study collected data via a questionnaire. The collected results demonstrated that the teachers' age, sex, experience and students' levels did not impact their perception technology. Nevertheless, other factors left an effect, such as the type of their institution (state or private schools), and the quantity of time they pass in research and technological atmospheres. Consequently, certain variants may lead views of technological integration into education to become uneven. In conclusion, the study affirms that Turkish English teachers' technological competence is generally unsatisfactory. In all cases, it also revealed that the technological integration into education in Turkey is not at the required level.

The researcher additionally analyzed one more variable that could be located in 9 of the 20 selected articles. Unfortunately, not all the selected articles investigated the variable of gender. Therefore, the study could collect data from only 9 articles (45%). Hence, analyzing the findings of those articles, regarding the 3rd research question_ "Is there any remarkable difference between male and female teachers' attitudes or proficiency in

relation to technology in teaching?" is to be investigated. (The articles involved in investigating gender are 3, 4, 5, 7, 8, 10, 13, 16, and 20).

Article 3: The findings in this article demonstrated that computer self-efficacy was in favor of male pre-service teachers over the female participants. However, the statistical figures indicate that the difference is not remarkable (p.195).

Article 4: This article concluded that no noticeable gap between the examined participants' gender and digital literacy or perception of technology was observed (p.73).

Article 5: This research concluded that there is a significant connection between the usage of the internet and computer literacy. The mean results assert that males pass longer time online, and their computer literacy is basically higher. Nonetheless, the general perception and attitudes of male participants were quite similar to those of the females (p.56).

Article 7: This article concluded that male and female teachers conceive the noticeable value of blogs, and they also expressed their will to implement blogs in their future educational practices (p.30).

Article 8: The data of this study generated the findings that the technological competence of the male participants exceeded that of their female counterparts. On the contrary, female participants' pedagogical competence was higher than the males'. Finally, in terms of the average difference between TPACK and professional achievement, the results indicated that no remarkable difference was recorded (p.6).

Article 10: This article results demonstrated that male teachers' TPACK abilities are remarkably higher than female teachers' skills. However, the study confirmed that little or no difference was recorded in terms of their perceptions of technology (p.25).

Article 13: This research demonstrated that male participants possessed a clear advantage in regard to their attitude of digital literacy. Apparently, male participants enjoyed higher digital inclination. Also, the results confirmed that technological operations are more effortful for female teachers (p.13).

Article 16: This study observed that the sub dimensions of importance, use, expertise and context recorded no statistically considerable difference in relation to gender (p.47).

Article 20: In this article, no remarkable bond seemed to be registered between technological capacity and gender. This finding may be expected for all humans now, no matter their gender, have gained evident access to technological tools.

4. FINDINGS AND DISCUSSION

This meta-analysis-based study analyzes the 20 articles and makes percentages about their results regarding the examined teachers' attitude and their technology implementation effectiveness. Furthermore, gender impact on the examined teachers and teacher-candidates will be investigated. The processed responses will range between negative, fair, positive, and high. Other similar responses or synonyms will be rounded to the aforementioned responses, as they are approximately equal, such as (competent, satisfactory, varied, comfort level, among others). Finally, the collected numbers and percentages will indicate the general impression about the collected data.

4.1 Introduction

Based on the followed methodology in this inquisition, the data that were gathered and analyzed from the selected 20 articles have been presented in the next section with their findings. The findings about research questions 1 and 2 involved all the 20 selected articles. As for the 3rd question, about gender, data were available in some of them only, 9 out of 20.

4.2 Research Findings

The processed data were collected from 20 articles written in the last decade. Out of the 20 articles, 11 (55%) investigated in-service teachers, while 9 (45%) addressed pre-service teachers. The in-service teachers' years of experience ranged between 1 and 11+ years. Their qualifications were BA, MA and PhD. The teachers and teacher-candidates who were the population in the selected articles studied or worked for both public and private institutions, and their occupation varied from primary schools to universities. Only 3 (Articles 1, 6 and 8) of the 20 articles did not specify the gender of their participants, but only provided total numbers (2 articles involved in-service teachers, while 1 studied pre-service teachers). Therefore, the researcher estimated approximate numbers for these articles.

The total number of the teachers in the 20 articles that were analyzed is 3294. The total number of in-service teachers is 1954, 1572 (80.4%) females and 382 (19.6%) males. As

for the pre-service teachers, the total number is 1340, 962 (71.8%) females and 378 (28.2%) males. Table 1

Table 1. Total number of participants

Participants	**N**	**Female**	**%**	**Male**	**%**
In-service teachers	1954	1572	80.4	382	19.6
Pre-service teachers	1340	962	71.8	378	28.2
Total	3294	2534	76.9	760	23.1

When analyzing the findings of the 20 articles, we can clearly perceive the generally positive impression in regard to the two variables of the research questions. At the moment of processing the responses, different synonyms might have been expressed by the participants, or used by the researchers in order to quantify the results. Therefore, the researcher in this paper opted to collect and analyze the responses as they were mentioned in the articles. The responses ranged between (generally negative, inadequate, unsatisfactory, varied, satisfactory, comfort level, generally positive, positive, competent, effective, high). Afterwards, the terms “generally positive, generally negative and varied” will be used to indicate the overall results, with percentages, too. The description “varied” may be related to several circumstances or variables that concluded to neutral or undefined responses. On table 2, the responses are arranged chronologically, starting from the oldest (2012) through the most recent (2022).

Table 2. Teachers' responses

Article and date	**Teachers' perception of technology**	**Implementation effectiveness of technology**
Article 1 (2012)	Positive	High
Article 2 (2012)	Generally negative	Unsatisfactory
Article 3 (2012)	Varied	Varied
Article 4 (2013)	Positive	Comfort level
Article 5 (2014)	Enthusiastically positive	Competent
Article 6 (2014)	Positive	Effective
Article 7 (2014)	Positive	High
Article 8 (2017)	Varied	Varied
Article 9 (2018)	Positive	Satisfactory
Article 10 (2019)	Positive	High
Article 11 (2019)	Positive	Unsatisfactory
Article 12 (2019)	Generally positive	High
Article 13 (2019)	Generally positive	Varied
Article 14 (2020)	Positive	High
Article 15 (2020)	Positive	High
Article 16 (2020)	Positive	Positive
Article 17 (2020)	Generally positive	Competent
Article 18 (2021)	Generally negative	Inadequate
Article 19 (2021)	Satisfactory	Satisfactory
Article 20 (2022)	Varied	Satisfactory

When processing the frequency of the above-mentioned data in table 2, we conclude to the following results in relation to each of the two variables. Table 3 illustrates the response frequency in regard to (teachers' perception of technology). The percentage of generally positive responses constitutes 75%, while the varied is 15%, and finally, the generally negative ones are only 10%.

Table 3.Teachers' perception frequency

Teachers' perception	**Frequency**	**Percentage**
Positive	10	50%
Generally positive	4	20%
Satisfactory	1	5%
Varied	3	15%
Generally negative	2	10%

As for the second variable (implementation effectiveness), table 4 illustrates the collected responses with percentages. The generally positive responses reached 70%, whereas the varied responses were 15%, and the generally negative responses were 15%.

Table 4. Teachers' implementation effectiveness frequency

Implementation effectiveness	**Frequency**	**Percentage**
High	6	30%
Positive	1	5%
Competent	2	10%
Effective	1	5%
Comfort level	1	5%
Satisfactory	3	15%
Varied	3	15%
Unsatisfactory	2	10%
Inadequate	1	5%

The following chart, table 5, illustrates the collected findings of the 9 targeted articles. Most of the results drawn from 6 articles (66.67%) confirmed that no significant difference was observed regarding gender in terms of male or female teachers' digital literacy and/or their attitude towards technology. On the other hand, only 3 articles (33.33%) registered a significant gap between male and female teachers' conception or efficiency in relation to technology implementation.

Table 5. Gender differences

Article / Result	There is significant difference	There is no significant difference
Article 3		√
Article 4		√
Article 5	√	
Article 7		√
Article 8		√
Article 10	√	
Article 13	√	
Article 16		√
Article 20		√
Total	3	6
Percentage	33.33%	66.67%

4.3 Discussion for Research Questions

4.3.1 Research question 1

In regard to the first research question, *"What are the teachers' perceptions of implementing technology in EFL teaching according to the studies conducted between 2012-2022 in Turkey?*", we can conclude that according to the collected data following a meta-analysis of the selected 20 articles, the majority of EFL teachers expressed a generally positive attitude towards perceiving the importance of following and benefiting

from this novel invention. The percentage of generally positive responses constitutes 75%, while the varied is 15%, and finally, the generally negative responses are only 10%.

4.3.2 Research question 2

As for the second question: "*To what extent do teachers have digital literacy and effectively use technology according to the studies conducted between 2012-2022 in Turkey?*", the efficiency of implementing the available technological tools was concluded to be significantly effective. The collected figures indicate that result clearly. The generally positive responses registered a percentage of 70%, whereas the varied responses were 15%, and the generally negative responses were 15%.

4.3.3 Research question 3

In respect to the third question: "*Does gender have any significant impact on Turkish EFL teachers' perception of technology implementation or their digital literacy in relation to the studies performed between 2012-2022 in Turkey*?" the collected data from the 9 relevant articles show that the majority of the results that are presented in 6 articles (66.67%) confirmed that no remarkable difference was observed in terms of gender as for male or female teachers' digital literacy and/or their attitude towards technology. In contrast, only 3 articles (33.33%) confirmed significant difference between male and female teachers or candidate teachers in relation to their views of technology or efficiency of technology implementation.

4.4 Discussion

The intention of this research is to recognize the value of the teachers' comprehension deeply and accurately on the road to technology integration in education and to what extent the information and technological knowledge the teachers have might be supportive in the learning and teaching processes. The meta-analysis methodology has been picked out due to its appropriateness to the topic of the study in order to demonstrate a clear vision to the investigated case. Therefore, since the study carries a prominent situation, the discussion is fruitful to keep an eye on it and construct a promising step to boost the educational system.

The majority of the investigated articles indicate that EFL teachers in Turkey have a positive perception of utilizing technological instruments in their teaching. Moreover, the

collected data revealed that most of the participants admit that they implement technology fairly effectively in their classes. These findings assert previous studies conducted on similar concepts in Turkey.

When analyzing the results and percentages of research questions 1 and 2, related to teachers' beliefs of technology and their implementation efficiency of technology in language teaching, we can notice the extremely similar numbers and percentages that the investigation concluded to. This finding can lead us to make close bonds between the two criteria (perception and effectiveness of technology use) that were studied. Apparently, teachers that express positive views towards something, which is technology in this case, most probably enjoy better performance of that thing. This information reflects the great importance of properly preparing teachers or future teachers through adequate and contemporary theoretical and practical training sessions and programs. These training courses should be held during their pre-service studies, as well as during their in-service period, or according to their necessities.

In other words, teachers who have a highly positive perception of technology, have high level of efficacy in implementing technology and integrating it into their teaching. Unarguably, all the above mentioned is a step towards improving our students' performance and pushing forward the educational process so that it benefits from the most recent technological tools that make learning more motivated and more competent. In conclusion, ongoing pursuit of technological advancements is the key for preparing technologically capable teachers which results in more attractive and more effective teaching and learning processes.

On the other aspect, this inquisition concluded that the majority of the articles that are relevant to the issue of gender affirmed that no significant difference between male and female teachers existed in respect to their perception and/or their implementation efficiency of technology. In all cases, although the minority, 33.33%, reported various levels of difference in this regard, we are not supposed to discard this percentage. As discussed previously, these differences may differ according to the setting of time and place, in addition to other economic, social and psychological elements. More precisely, there were particular aspects that are related to technology that may be of more or less

importance to each gender, such as (education, gaming, communication, programming, designing and others).

5. CONCLUSIONS AND SUGGESTIONS

5.1 Introduction

Overview of the study

- Considering the time in which this study was conducted, the final results of the research seem to provide significantly solid and clear data that can help scholars and educators better understand the recent situation. The meta-analysis method followed in this research may be necessary in various fields of education investigation processes. Conducting such studies periodically can provide statistically genuine findings which contribute to analyzing the cons and pros of the investigated issues. Understanding and analyzing the recent situation is a cornerstone in developing and elevating the tackled matters.

  The main target is to theoretically evaluate the teachers' view and knowledge first, and then harvest the results practically. Language teaching is both academic and vocational. Examining the above-mentioned sample of teachers by choosing specific articles using a meta-analysis method, did not permit us to observe their classroom practices. However, collecting varied data can give voice to all teacher-students and teachers who work at private and state schools and other institutions.

  A strong recommendation is integrating technology, or educational technology, in teacher preparation courses or programs. Raising teachers' awareness of these recent technological tools, platforms and applications has become a must for modern and contemporary language teachers. The outcome should be absolutely fabulous, and the students will profoundly benefit from such implementation of these tools. As long as deploying technology in education makes teaching and learning more motivating, more interesting and more attractive, then it certainly makes it more effective.

  At the same time, although the recommendation is that English teachers should adopt and implement the latest and cutting-edge technology in their classes, they are required to adapt it to the age, level, and number of students. Also, educators are requested to adapt theories to make the best out of them according to their students' specific needs – for example, teachers may deploy more reading or more listening technology-based activities. Another suggestion is boosting communication, collaboration and exchanging experiences among teachers through committees, blogs, conferences and others. Turkish teachers of English are

expected to continue growing and promoting technology for the sake of a more effective educational process. Goldie (2016) believes that "Creating online communities using social media promotes connectivity" (p.4). Social media platforms can result in better communication among teachers can enhance their knowledge about each other's experience in the field. Also, social media may make learning more engaging for students, and more motivating.

5.2 Summary of the Research

- This research analyzed 20 articles that were conducted during the last 10 years, which tackled Turkish teachers' perception and efficiency of implementing technology in EFL teaching. Out of the 20, only 9 articles discussed the impact of gender on the topic of technology implementation in EFL teaching in Turkey. A relatively significant number of teachers and teacher-candidates were the participants in these 20 articles (3294 pre-service and in-service teachers).
- The meta-analysis methodology, which has been applied in this investigation, concluded to the following results. First, the majority of Turkish teachers and student-teachers of English have a positive perception of technology. Second, the majority of them effectively implement technology in their classrooms. Thirdly, there is generally little or no difference between Turkish male and female teachers in respect to their perception or effectiveness of technology in their educational performance.

5.3 The Conclusions of the Study

The world has suffered an expected pandemic outbreak that profoundly affected the educational system. This pandemic presented teachers and students to increasingly interact with and manage the technological tools as a way to proceed the education process with the advantages and the unanticipated difficulties and challenges that might occur in the path of continuous development of education.

In order for us to respond to the first question in this research, we can conclude that according to the collected data following a meta-analysis of the selected 20 articles, the majority of EFL teachers expressed a generally positive attitude towards perceiving the importance of following and benefiting from this novel invention. As for the second question, the effectiveness of implementing the available technological tools was

concluded to be fairly influential. Finally, in regard to gender, the findings confirmed that the majority of the articles concluded that there is no significant impact of gender on the discussed issues.

The data reveal that the majority of the participants were optimistic with respect to utilizing technology in education. Besides, a decent number of teachers were competent to deal with the vast devices. This has led to recession in teaching outcomes that call for urgent research and training. Nugroho et al, (2020, p.278) assert that resolving the teachers' obstacles and challenging issues, and considering their recommendation about virtual classes amid the pandemic is absolutely vital.

5.4 Pedagogical Implications of the Study

The quantitative research findings revealed that the teachers largely have satisfactory views concerning the usage of technology in education. Furthermore, their practices of using the technological tools are significant. Undoubtedly, further academic study or training will result in better understanding and deeper analysis of the case.

When a teacher technologically knows how teaching functions and is well-trained to deal with technology, the teacher will give higher performance. This will absolutely yield more effective education. Recently, many countries have seen many teachers abandoning the teaching profession due to lack of official or social support and remuneration in other cases, which can catastrophically result in teacher shortage or untrained low-quality teachers, even in the US. The deteriorating concern in the teaching profession is closely associated with unnoticed changes in regards to the nature of this career, as a result this job ended up unappealing in the eyes of the young individuals (Berry & Shields, 2017, p.9). Those changes may include economic, social and stress elements, resulting from the general devaluation impression.

A few participants demanded professional development programs and training, particularly in terms of technology-based integration and digital knowledge in regards with English language teaching. Teachers' professional development is an absolutely crucial element in their career. Once modern part of this development is integrated in their educational technology and digital literacy, teachers should be able to overcome any technical obstacles that they may face when working virtually or when handling

technology. Learning these findings seems to be in agreement with Nugroho et al, (2020, p.284).

5.5 Suggestions for Further Studies

This study focuses only on teachers' perceptions and competence regarding technology. Further studies may be more concentrated on investigating the learners' perceptions of this topic in a similar meta-analysis method. Additionally, future studies might dive into detailing the implementation of the present digital tools, their advantages, and disadvantages to the educational process.

After all, additional research on this topic should be done for deeper understanding. Future studies on the current topic are therefore recommended. Technology integration in education using a plenty of technological resources imply sensitive aspects that need to be addressed and analyzed thoroughly. It is suggested that further research be performed in the preceding disciplines: First, scientific analysis of the usage of technology in learning and teaching should be adapted and reconsidered from different perspectives particularly for the current situation which held the pandemic and the digital natives' generation. Second, to spread more awareness regarding technology integration in learning and language difficulties, such as autism, lack of information technology literacy, curriculum development, internet connection problems, and lack of technological devices. Several studies have been questioning the link between excessive use of technology or too early use by infants and many mental and psychological disorders.

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CURRICULUM VITAE

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Education

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Master's degree: 2022, Maltepe Universıty, English Department, English Language Teaching.

Bachelor's degree: 2011, Albaath University, Bachelor of Arts, English Literature.

Work Experience

ESL/EFL Teacher:

-(11/2018 – 3/2020) Taught IELTS, TOEFL, advanced, intermediate as well as elementary levels at the American Cultural Association Language Schools - Istanbul, Turkey.

ESL/EFL Teacher:

-(11/2015 - 10/2018) worked as an English teacher at DFP, Dairy and Food Polytechnic College in Alkharj, KSA, teaching general English like ESOL, Top Notch and ESP courses like Tech Talk, Mechanical English for several levels and teaching ESP for all majors of dairy and food polytechnic like Maintenance and Repair, Food Technology, and Animal Production trainees. In addition, trained the trainees to be qualified to join Almarae Company.

-(09/2016 - 10/2018) Taught several subjects in English like “Terminology” and “Work Ethics” for different levels and majors.

Curriculum Development Coordinator:

- (09/2012 - 11/2015) developed supplementary materials (audio, video, PPP, etc.) to all the different general English and ESP courses taught. Coordinated with the different academic units to achieve the policy of SAU.

ESL and ESP Teacher:

- (09/2012 - 11/2015) taught English to medicine and engineering students at Prince Sattam University, KSA.

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ESL/EFL Teacher:

- (February 2012 - September 2012) taught English courses of different levels at Al-Zarqaa Academy, employing several educational aids, such as smart board, Internet, audio, and video materials - Riyadh - KSA.