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EMERGENCY REMOTE TEACHING IN TURKEY: A SYSTEMATIC LITERATURE REVIEW

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Emergency Remote Teaching in Turkey: A Systematic Literature Review

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November 2022

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ABSTRACT

EMERGENCY REMOTE TEACHING IN TURKEY: A SYSTEMATIC LITERATURE REVIEW

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M.A., Program of Curriculum and Instruction

Advisor: Asst. Prof. Dr. Armağan Ateşkan

December 2022

The aim of this study is to systematically review the literature on Emergency Remote Teaching (ERT) during COVID-19 period in Turkey which started on March 23, 2020 and continued until the end of the spring term 2019-2020 in K12 and higher education context. The study sample consisted of 52 articles which were located from Scopus, ERIC and DergiPark databases through search criteria and examined under systematic literature review procedures. Articles are categorized according to their demographic data; methodology, data collection tools, size of the sample, sample type, level of the sample, curricular area, and digital platforms. Results indicated that qualitative research methods were the most preferred amongst the studies, conducted mostly in the higher education level. Sample sizes of the studies differed between 0-400 and small-scale research was the most popular. Amongst the articles, video conferencing tool Zoom was the most encountered digital tool. The research articles were reviewed to locate the changes happened within the teaching-learning cycle during ERT period regarding students and teachers of K12 and higher education contexts. Findings included following patterns; concepts of context as accessibility, flexibility of time and space, characteristics of home environments, internet and infrastructure problems, inequalities in possession of required technology; concepts of classroom processes as participation, use of materials and communication between students and instructors; concepts of input as content, students' levels of interest and motivation, students' study habits and students' learning style. Implications for practice and implications for further research were given.

Keywords: Emergency remote teaching, distance education, COVID-19, online learning

ÖZET

Türkiye'de Acil Uzaktan Eğitim: Sistematik Literatür İncelenmesi

Selin İNAL

Eğitim Programları ve Öğretim Yüksek Lisans Programı

Danışman: Dr. Öğr. Üyesi Armağan Ateşkan

Aralık 2022

Bu çalışma COVID-19 pandemisi sırasında Türkiye'de 23 Mart 2020 tarihinde başlayıp K12 ve yüksek öğretim bütünlüğünde 2019-2020 eğitim öğretim yılının bitişine kadar devam eden Acil Uzaktan Eğitim (AUE) dönemine dair olan literatürü sistematik bir şekilde inceleme amacıyla yürütülmüştür. Çalışma dahilinde belirlenen kriterler doğrultusunda Scopus, ERIC ve DergiPark veri tabanlarından 52 adet araştırma makalesi belirlenip, sistematik alanyazın tarama prosedürlerine uygun olarak analiz edilmiştir. Makaleler metodoloji, veri toplama araçları, örneklem büyüklüğü, örneklem türü, örneklemin eğitim seviyesi, eğitim-öğretimin gerçekleştirildiği alan ve dijital platformlar olmak üzere demografik verilerine göre kategorize edilmiştir. Sonuçlara göre nitel araştırma yöntemleri en çok yüksek öğretimde gerçekleştirilerek araştırma genelinde en çok tercih edilen yöntem olmuştur. Araştırmaların bireylerden elde edilen veriler dahilindeki örneklem büyüklüğü 0-400 arasında değişmektedir ve küçük çaplı araştırmalar en çok tercih edildiği görülmüştür. Araştırmalar içerisinde en çok tercih edilen dijital araç Zoom video konferans aracıdır. Çalışma dahilinde belirlenen araştırma makaleleri AUE sırasında K12 ve yüksek öğretim bütünlüğünde öğretmenlerin ve öğrencilerin öğretme-öğrenme sürecinde karşılaşmış oldukları değişiklikleri belirlemek amacıyla incelenmiştir. Bulgular kısmında öğretme-öğrenme çerçevesi dahilinde erişilebilirlik, zaman ve mekân esnekliği, ev ortamının özellikleri, internet ve altyapı problemleri, gerekli teknolojiye sahip olma konusunda yaşanan eşitsizlikler, derse katılım, materyal kullanımı, öğrenciler ve öğretmenler arasındaki iletişim, içerik, öğrencilerin ilgi ve motivasyon düzeyleri, öğrencilerin çalışma alışkanlıkları ve öğrencilerin öğrenme stilleri şeklinde kalıplara ulaşılmıştır. Çalışmanın sonunda olası bir AUE süreci hakkında öneriler belirtilmiştir.

Anahtar kelimeler: Acil Uzaktan Eğitim, uzaktan eğitim, COVID-19, çevrimiçi eğitim

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CHAPTER 1: INTRODUCTION

Introduction

COVID-19 pandemic has drastically changed the way people maintain their life since its start in March 2020. Around two years have passed, and more than 6,5 million deaths have occurred due to the virus and there have been more than 600 million confirmed cases up to March 2022 (World Health Organization [WHO], 2020a). New measurements had to be taken to convert to a new but compulsory style of living to stay healthy during the past two years and people were obligated to follow a set of rules and adapt to a certain lifestyle to help prevent the spread of the virus. Social distancing, wearing masks and washing hands are some of the current measurements and a part of the new normal (WHO, 2020b).

Many areas such as economy, social interaction and employment have been affected; education was also one of the major areas that took a grand hit. Education worldwide had to pause traditional face-to face learning temporarily in March 2019. The pause resulted in a rapid shift to the Emergency Remote Teaching to continue education (ERT) in many countries, which is different from remote education as it is temporarily done when there is a crisis present. ERT "involves the use of fully remote teaching solutions for instruction or education that would otherwise be delivered face-to-face or as blended or hybrid courses" (Hodges et al., 2020, p. 6). During the current pandemic these solutions involved implementation of online classrooms, TV, radio and CALL to facilitate and aid the delivery of education (Organisation for Economic Co-Operation and Development [OECD], 2020).

Rapidly involving digital learning solutions to distance learning as a solution led to severe problems worldwide such as inequality in accessing technology, lack of infrastructure and teacher preparedness (United Nations International Children's Emergency Fund [UNICEF], 2021). Another issue caused by the COVID-19 pandemic is psychological distress (Bozkurt, 2022).

Turkey was one of the countries that had to go through similar phases. Education nationwide shifted to a compulsory remote education starting from 23rd March 2020 as a precaution to spreading the virus (Council of Higher Education [CoHE], 2020a; Ministry of National Education [MoNE], 2020a) until the end of spring semester 2020, making it a part of the Emergency Remote Teaching period (Eken et al., 2020). Similar to the world, the pandemic has affected the education in Turkey as well.

The aim of this study is to categorize and review the articles that have conducted research on the ERT period in Turkey based on their characteristics. By synthesizing changes which happened resulting from the ERT period within the teaching-learning process, this study also aims to contribute to the current literature that is limited as it is now. Through carefully investigating those changes, a better understanding of this existing phenomenon can be achieved and a higher chance to improve strategies regarding education and plans for similar possible situations can be ensured.

Background

The art of teaching is a complex matter in which educators and institutions require to have a good command of different types of knowledge and the flexibility to adapt to different situations to be effective in their teaching environments. One of the most significant changes that education field has had to face in the latest years is

the presence of a pandemic that had begun in March 2019, the COVID-19 Pandemic. With the WHO's Director-General's declaration of pandemic on March 11, 2020, people all around the world found themselves in a drastic situation (WHO, 2020d). Face-to face education worldwide had to be paused to avoid the further spread of the virus, leading to an unexpected situation of shifting to an emergency remote teaching.

Around 1.7 billion children's face-to-face education had to be interrupted (OECD, 2020) and more then 220 million higher education students had to experience the effects of university closure because of the virus (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2021). Unexpected situations emerged, forcing teachers, academics, and lecturers around the world to change their ways of conveying knowledge when education worldwide stepped into a different format. Although distance education strategies were present when pandemic emerged, there was very limited and insufficient time to adjust the distance education models effectively. Most of the distance education strategies are carefully planned before they are executed; the variables can be calculated, and strategies can be altered beforehand. Emergency remote teaching made these careful planning steps impossible as COVID-19 pandemic has been a one of a kind phenomenon.

ERT period for Turkey started when Ministry of Education (MoNE, 2020a) and the Council of Higher Education (CoHE, 2020c) announced that education nationwide would continue by following remote education methods starting from March 23rd, 2020. Then the emergency remote teaching period continued until the end of the spring semester for K12 and higher education. Technology gained more importance and became essential to continue education. As an immediate solution to the closure period, in K12 level emergency remote teaching took place via

Educational Informatics Network (EIN) platform (OECD, 2020). Later on, teachers were offered the chance to conduct live lessons as a part of live class platform through E (MoNE, 2020c) and private schools continued the ERT period using their own infrastructure if they preferred (MoNE, 2020e).

At higher education level universities shifted to online education using their own structure starting from March 23rd, 2020. Selected course content were made available for free through (CoHE) Courses Platform (CoHE, 2020a). Regulations were made to avoid learning loss, such as replacing face-to face exams with online assessment solutions. Developments of infrastructures and technical support systems were made, and online training sessions were offered in certain institutions to improve digital literacy. This study tried to put journal articles on the ERT period in Turkey into an organized structure to facilitate further research and to provide insight to the ERT period by categorizing data and presenting the changes happened within the teaching-learning cycle during the ERT period as stated in the research questions.

Problem

Different roles in the education wheel such as parents, instructors and learners faced psychological discomfort such as anxiety and distress; household chores have increased and data privacy concerns have emerged regarding the use of some online services and (Bozkurt et al., 2020). Turkey was amongst many countries that had rapidly adapted to digital, computerized online learning systems during the ERT period. The experiences gained during this period were unique, as no similar situation had happened before, leading to valuable positive and negative lessons.

During the pandemic period the need to strengthen distance education's infrastructure, design, content, and other aspects have emerged (Can, 2020). Furthermore, some drawbacks located in the literature concerning this period can be

listed as internet and technical problems (Han & Demirbilek, 2021), social and emotional discomfort (Gençoğlu & Çiftçi, 2020), problems about the effectiveness of applied lessons and communication problems between instructors and learners (Keskin & Özer, 2020). Instructors also observed that students had low engagement levels since they had been separated physically from their peers during the emergency remote teaching period (Huck & Zhang, 2021).

Some positive notes during the pandemic period are also present; Canpolat and Yıldırım's (2021) research on middle school teachers' views remark the improvement of digital literacy; in Moçoşoğlu and Kaya's (2020) research it is found that according to teachers, distance education provides students to be flexible regarding time and place to review the subjects. Studying freely in terms of time was found in Bond's 2020 literature review (Bond, 2020). The constraints and benefits mentioned in the studies referred above represent a small portion of the literature, resulting from different types of changes whereas many other significant ones are present in the rest of the literature. To better understand the significant variables and key factors and to be prepared for the possibility for a similar situation, a comprehensive presentation of these changes is needed. A thorough presentation of these changes can be given through systematically reviewing the literature as it can strengthen our understanding on the extent of a phenomenon (Newman & Gough, 2020).

When the relevant literature was searched, even though certain literature reviews are present, there were no systematic literature reviews presenting the studies that focused on the articles during the ERT period in Turkey. Therefore, as mentioned above, changes occurring to the teaching-learning process on K12 and higher education which have significant value in planning and strategizing phases

along with the demographics of the ERT period in Turkey, needed to be presented and categorized to provide an overlook. With this study, it was aimed to draw a structured frame on the ERT period in Turkey to deeply comprehend the characteristics and changes happened during this period, to aid further studies, to be thoroughly informed during decision making when strategizing for possible situations.

Purpose

The purpose of this research is to systematically review the literature on the ERT that took place during COVID-19 pandemic period in Turkey. This study is designed to examine relevant studies according to methodology, data collection tools, sample, curricular area, and digital platforms. It is aimed to provide an overlook to Turkey's situation in a systematic manner. Furthermore, the changes happened within the teaching-learning cycle are presented and investigated to better understand the results within the teaching-learning process during the ERT period. Having the latest information is significant when developing educational strategies therefore the article selection process has been made in February 2022 to present the most current review. Compared to the beginning of the pandemic, where there were very limited studies, this study offers current data with the revision of 52 articles; allowing researchers, academics, teachers, and teacher candidates to further their knowledge on characteristics and changes happened during the ERT period.

Research Questions

This study aimed to find answers for the following main and sub-questions:

1. What is the distribution of research about Emergency Remote Teaching in Turkey during COVID-19 period according to;
    a. methodology and data collection tools

b. sample size, sample type and grade level of the sample
c. curricular area
d. digital platforms used during the ERT period

2. What kind of changes resulting from the ERT period happened in the teaching-learning cycle regarding teachers and students in K12 and Higher Education level in Turkey?

Significance

Systematic literature reviews can be conducted to reach to most significant and reliable results of an unknown situation; they can aid the researchers to present the common constraints and benefits of unique circumstances. Therefore, they can have great importance strategizing, prevention and decision-making process. Sofaer and Stretch (2012) notes the purpose of systematic reviews as "to improve decisions: to enable decisions that are maximally informed and minimally biased". Emergency remote teaching which is caused by the COVID-19 pandemic has been an extraordinary situation therefore it has led to noteworthy results in the education field. "Systematic reviews provide a key source of evidence-based information to support and develop practice" (Petticrew & Roberts, 2008). To analyze this period, it is crucial to have reliable knowledge on the key points and this can be achieved through a qualitative systematic literature review. In this study through answers to research questions, it was aimed to provide a comprehensive understanding of demographics and changes resulting from the ERT period, which may serve important key factors during research, planning and improvement stages of curriculum design.

Definition of Key Terms

Emergency remote teaching (ERT): Emergency Remote Teaching; “a temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances (Hodges et al., 2020, p. 6)”

Computer assisted language learning (CALL): "the search for and study of applications of the computer in language teaching and learning (Levy, 1997, p. 1)"

Council of Higher Education (CoHE): *Yüksek Öğretim Kurulu (YÖK),* Council of Higher Education (CoHE, n.d.). “The CoHE is an autonomous institution which is responsible for the planning, coordination and governance of higher education system in Turkey in accordance with the Turkish Constitution and the Higher Education Laws (CoHE, n.d.)”.

Ministry of National Education (MoNE): *Milli Eğitim Bakanlığı (MEB)*, Ministry of National Education. “The Ministry of National Education (MoNE) is responsible for pre-primary to upper secondary level education, and adult education (OECD, 2020, p.18)”.

The teaching learning process: “a transformation process of knowledge from teachers to students and the combination of various elements within the process where an educator identifies and establish the learning objectives and develop teaching resources and implement the teaching and learning strategy” (Munna & Kalam, 2021, p. 1).

CHAPTER 2: LITERATURE REVIEW

Introduction

The COVID-19 pandemic's arrival has brought many challenges in diverse fields around the world. The announcement made by WHO's Director-General's on March 11, 2020 (WHO, 2020c), shifted the world's primary concern to the newly defined pandemic. Effects of the pandemic were perceived on national level and individual level; precautions had to be executed to sustain healthy living conditions. Health, economy, tourism, welfare, employment and many more areas had to go through extreme changes. The COVID-19 pandemic which has profoundly affected many fields around the world and Turkey has affected education as well (Kırmızıgül, 2020).

Education face-to-face had to be paused worldwide starting from mid-March of spring semester 2020, creating a crisis in education, forcing educators to shift to alternative methods to provide continuity of teaching. School and university closures resulted in affecting more than 1.5 billion learners worldwide (UNESCO, 2022). In a very short time period, distance-learning strategies were put into action as emergency remote or distance teaching methods. Since the shift to the ERT had to be done as fast as possible due to lockdowns, the effectiveness of the strategies could not be studied immensely, the readiness of institutions, students, teachers and all the other parties included in education cycle could not be checked.

The emergency remote teaching (ERT) period involved the use of technology in different forms such as the use of Internet connected resources, television, or radio broadcasts. Technology has played a significant role in the emergency remote

teaching and learning process, but its unplanned use also caused certain negative impacts such as inequities regarding accessing to technology (Huck & Zhang, 2021). Other than the use of technology, education during pandemic had other variables that had to be thought through before their execution but could not done so because of the time limitations. Instructors did not have enough time with the sudden hit of the pandemic and most of them were not ready to adjust their teaching to the distance education methods (Giovannella, 2020). Psychological effects of having to stay under quarantine and infrastructural limitations were considered significantly. These limitations resulted in negative derivatives such as motivation and adaptation problems.

The ERT period on education cycle did not have only negative outcomes, on some areas positive results were observed. It can surely be stated that there were lots of valuable lessons learned from the ERT period. Akbana et al.'s document analysis on foreign and second language teaching (2021) instructors from different countries indicate that the ERT period helped them strengthen their digital literacy skills and aid their creativity, problem solving skills and autonomy levels have increased.

Turkey has been amongst the countries which has faced negative and positive consequences during the ERT period. There are many examples to these consequences which can be found in the literature. In Fidan's (2021) research, according to primary school teachers, access and infrastructure problems are the lead negativities faced during the ERT period, nonetheless there are also positive points present in the research; teachers from the sample think that the educational implementations during the ERT are positively effective on students' academic achievement in short terms.

The aim of this chapter is to provide necessary information and detailed insight about COVID-19 pandemic, characteristics of the teaching-learning processes, definitions of distance education and emergency remote teaching and their differences; examples of distance education from Turkey and the measurements and strategies taken during the ERT period in Turkey. Prior literature review about the ERT period around the world is also examined under this chapter to deliver a better understanding of the period.

The Teaching-Learning Process

Teaching and learning are two inseparable pillars of education process. Teaching and learning become possible through interactions between instructors and learners. Concepts of learning and teaching are the utmost importance in curriculum design where the main goal is to achieve successful educational outcomes. Learning is described as “an increase, through experience, of problem-solving ability” (Washburne, 1936, pp. 603-611) whereas teaching can be defined as “a set of events, which are designed to support internal process of learning” (Sequeira, 2012, p. 3). The combination of two refers to the process where knowledge is conveyed from instructors to the learners (Munna & Kalam, 2021). Huitt (2003) developed a framework to discover answers to the questions of how learning occurs in learners, the reasons of learning differences and focus of learning. He put components of learning into four categories of context, input, classroom processes and output which can be seen under Figure 1.

Figure 1

Components of Teaching-Learning

A Transactional Framework of the Teaching/Learning Process	
Context	All those factors outside of the classroom that might influence teaching and learning
Input	Those qualities or characteristics of teachers and students that they bring with them to the classroom experience
Classroom Processes	Teacher and student behaviors in the classroom as well as some other variables such as classroom climate and teacher/student relationships
Output	Measures of student learning taken apart from the normal instructional process.

Note. From "*A Transactional Framework of the Teaching/learning Process"* by W. Huitt, 2003, *Educational Psychology Interactive,* p. 1 (http://www.edpsycinteractive.org/materials/tchlrnmd.html) Copyright 2003 by Bill Huitt.

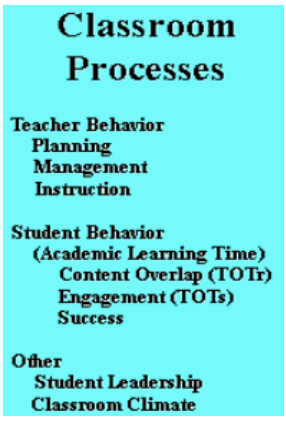
Context, input and classroom processes combined together results in the learning outputs such as student achievement (Huitt, 2006). Context category consists of significant variables which occur externally of the classroom environment. Under context, there are institutional features such as administrative structure, physical conditions of the institution or home environment characteristics such as the available technology. Input category is related to the teacher and students' characteristics. Students' motivation levels, prior knowledge, learning habits and teacher efficacy and their content knowledge, can be counted as some important variables under input heading. Classroom processes split into three categories according to the framework; "teacher behavior, student behavior and other" (Huitt, 2003, p. 2). Other category is related to elements that may affect learner achievement in classroom environments and are non-related to student and teacher behavior.

Teacher behavior is examined under planning, management and instruction headings (Figure 2) whereas student behavior consists of the actions students take during lesson time. Student behavior is highly related to the Academic Learning Time which stands for the time span where learners study the content that will be

measured (Huitt, 2006). Increases in Academic Learning Time may show changes according to the teacher behavior and activities done during the time assigned for learning in classroom environments (Huitt, 2005). It is separated into three categories as it can be seen in Figure 2 as "Content Overlap, Engagement, Success". Content overlap stands for how much content taught during classroom time aligns with the content assessed in the measurement units (Huitt, 2003). Engagement refers to interest, involvement, and connection levels of learners to the learning process (Axelson & Flick, 2010). Success in academic form stands for "accomplishment of learning objectives, and acquisition of skills and competencies" (York et al., 2015, p. 7). Output category is considered the most important element of the framework since it allows to measure the end product of the application of the teaching learning process. The process starts with selecting the objectives then the input, classroom processes and context are altered according to the wanted outcomes (McIlrath & Huitt, 1995). The output category comprises of measurements taken to assess the learning that occurred as a result of the teaching learning process.

Figure 2

Classroom Processes



Note. From "*A Transactional Framework of the Teaching/learning Process"* by W. Huitt, 2003, *Educational Psychology Interactive,* p. 2 (http://www.edpsycinteractive.org/materials/tchlrnmd.html) Copyright 2003 by Bill Huitt.

COVID-19 Pandemic Around the World and Turkey

"Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus" (WHO, 2020b). The virus affects the respiratory system and people may show different symptoms. The virus is called "severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)" and the disease as coronavirus disease, short for COVID-19 (Centers for Disease Control and Prevention [CDC], 2021).

Some individuals can recover without medical aid whereas for some people the virus can be fatal. 452,201,564 COVID-19 cases were reported as of March 12, 2022, with more than 6 million deaths (WHO, 2022a). Spreading the virus can happen during simple daily actions such as speaking or simply breathing, making the spread risk very high (WHO, 2020b). Particles humans breathe during daily actions may contain the infectious Coronavirus, the risk is fewer if crowded places are avoided, and social distance is kept at all times (CDC, 2022a). The World Health Organization remarks the importance to be alert for the three C's which are crowded settings, close contact between people, confined places with poor air ventilation (WHO, 2021a).

Social distancing can be defined as maintaining a one and a half meters of physical distance between individuals and is considered as amongst the most effective measures against coronavirus (Qian & Jiang, 2020). When an infected individual performs a daily act such as coughing can lead to spread of the virus and short-range airborne transmission can happen if another individual inhales the infected particles (WHO, 2020b). Therefore, social distance is at utmost importance to avoid spreading the virus. High levels of ventilation, spending time in open places instead of airless narrow environments, proper use of face masks is also amongst preventative measures.

The virus can also be transmitted through touching non-living surfaces. Touching mucous membranes such as eyes, mouth, or nose after being in contact with infectious surfaces may result in getting infected by the virus (WHO, 2021c). It can be interpreted that a high level of attention is required to avoid touching mucous membranes since individuals touch their faces many times during a day; according to a study made in 2015 where 26 students were observed, an immense amount of face touching was recorded, 23 times in one hour; 2,346 in total of the study where 1,024 of the touching were mucous membranes (Kwok et al., 2015). Handwashing is another significant way of preventing the spread of the virus; Center for Disease Control and Prevention (CDC, 2019a) states that hands should be washed with water and soap after touching inanimate places that may be in high traffic areas.

People who carry the virus may or may not demonstrate symptoms. Amongst these symptoms fever, coughing, difficulty in breathing, headache, loss of taste or smell might be observed, and these symptoms may start after two days to a fortnight after getting intact with the virus (CDC, 2022c). To fight the virus and to maintain health; precautions, limitations and measurements have been taken worldwide. Limitations of businesses, schools, gatherings, domestic movements, and travel have been made. The measurements can show minor differences between countries, but they all sustain main precautions such as social distancing, wearing masks and washing hands frequently (WHO, 2021c).

The timeline of COVID-19 starts with December 31, 2019, in China's Wuhan City, as 44 individuals suffered from pneumonia from unknown causes (WHO, 2020c). On January 13, 2020, the first case outside of China is reported (CDC, 2022b). The virus continued spreading and Japan, The USA, France, The United Arab Emirates, Germany, Viet Nam and 11 more other countries reported cases up

until January 30, 2020, when WHO announced that the outbreak as a public health emergency of international concern (PHEIC) (WHO, 2021b). On February 11, 2020, the disease was given the name 'COVID-19' and a month later, WHO declared the outbreak as a pandemic on March 11, 2020.

The first COVID-19 case in Turkey was reported on March 11, 2020. According to the WHO statistics, 14,487,482 cases were confirmed, and more than 96,000 deaths were reported up until 12 March 2022 (WHO, 2022b). Lockdowns, curfews and restrictions were implemented to prevent spread of the virus and measurements similar to other countries were taken.

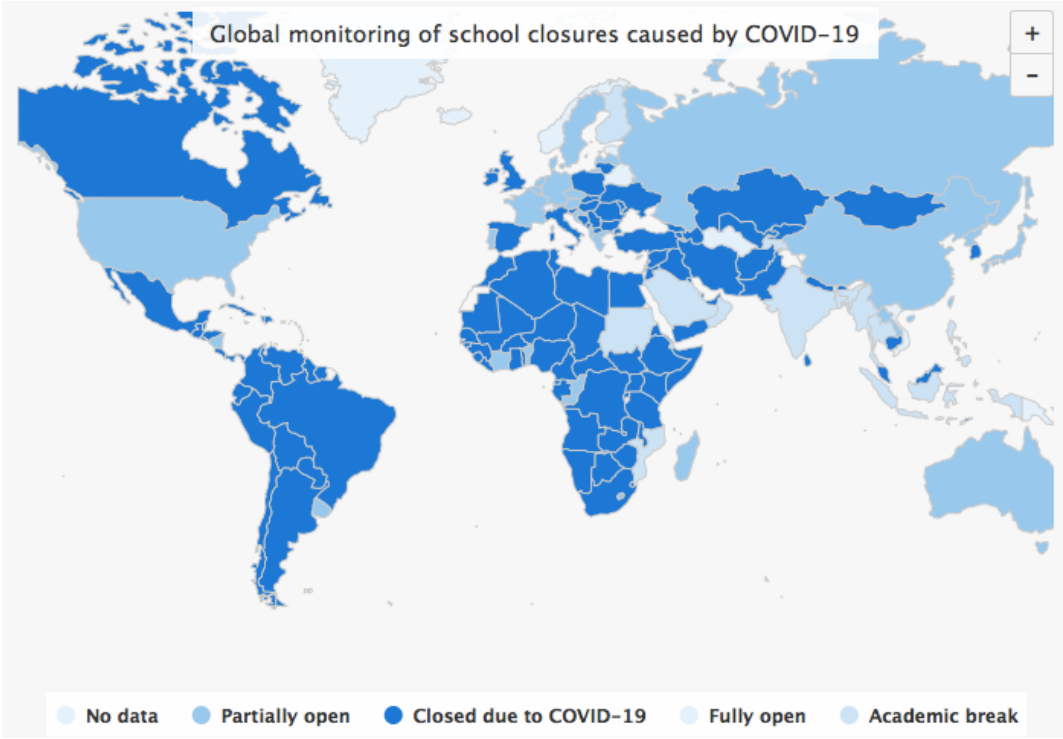
Ministry of Health in Turkey declared many preventive measurements that individuals should follow during their daily lives; some of these measurements can be listed as; hand sanitization, social distancing, using masks, ventilation, avoiding risky environments and travelling if possible and consulting healthcare centers for any possible symptoms, avoiding touching mucous areas without proper hand sterilization (Ministry of Health, 2022). The first lockdown took place between 10.04.2020 24:00 and 12.04.2020 24:00 (Ministry of National Affairs, 2020) when citizens were not allowed to leave their homes; other lockdowns were carried out later on as a preventative measure. Authorities in Turkey have developed an application called "Life Fits Into Home" to help people get informed, find out about risky environments, test their social distances, and get a code stating whether they are positive, negative or at risk regarding COVID-19.

Apart from social lives of people, COVID-19 has had many uncommon results in education field. When educational calendars are observed, March 2020 was the beginning point of the school closures to contain the spread of the virus and around 150 countries declared that they would switch to distance learning and shut

down their schools (UNICEF, 2021). The exact date of the start of the closure for each country may show differences but roughly two months after the start of the closures 39.9 % of total enrolled learners resulting in around 630 million learners were affected according to UNESCO, as it can be seen under Figure 3.

Figure 3

Global Monitoring of School Closures Caused by COVID-19, 18 May 2020



Note. Taken from *Education: From School Closure to Recovery*, by UNESCO, n.d. (https://www.unesco.org/en/covid-19/education-response).

As for Turkey, Minister of Education announced that all schools nationwide would be closed for two weeks (MoNE, 2020b), however education would continue starting from 23rd of March via EIN network containing internet and television programs as a solution to distance learning, involving more than 18 million students in K12 context including pre-primary. Therefore face-to face education was paused on March 16, 2020; the one week break for spring term was brought forward and education continued starting from March 23rd until June 19, 2020. As for tertiary level The Council of Higher Education (CoHE) announced that education would

continue through universities own digital infrastructure, starting from 23rd of March 2019. For universities who do not have sufficient levels of infrastructure, CoHE created a free online platform called CoHE Courses Platform (*YÖK Dersleri Platformu*), offering content from three universities (CoHE, 2020a; OECD, 2020).

Turkish national education system is organized under two main branches, formal and non-formal education. Formal education levels include pre-primary, primary school, lower secondary school, upper secondary and higher education whereas any other education activities are called non-formal education. Compulsory education in Turkey is completed in 12 years as 4 years for primary school, 4 years for lower secondary school and 4 more years for upper secondary school and it is offered as free of charge in public schools. After completing their compulsory education, individuals can apply to higher education institutions, which are not compulsory. Learners who wish to continue their education after compulsory education are required to take university entrance exams. The Council of Higher Education (CoHE) is responsible for higher education institutions in Turkey. Higher education embodies universities, faculties, institutes, colleges, conservatories, vocational colleges and centers for practice and research. There are 207 universities present in Turkey and according to CoHE statistics, there have been 4.676.657 total learners enrolled in universities in Turkey in 2020-2021 (CoHE, 2022). Individuals have the opportunity to continue their education in higher education institutions after university.

Distance Education and Emergency Remote Teaching

Distance Education

Distance education have become a hot topic in the literature since the declaration of the COVID-19 pandemic, but distance education practices have been present in the education for quite a long time. What separates distance education from traditional education is that instructors and learners are located in different places. Distance education can be defined as "institution-based, formal education where the learning group is separated, and where interactive telecommunications systems are used to connect learners, resources, and instructors" (Simonson et al., 2019, p. 28). He mentions four components of distance education. As the first component he talks about its difference between self-study, distance education being institutionally based. Then as the second component he refers that in distance education the teacher and the student are not located at the same place, they are separated. Thirdly he draws attention to the interaction between the instructor and the learner, for distance learning interaction is a must and it can be achieved synchronously or asynchronously. Lastly, he underlines that the process must involve a communication method, which can be done in electronic forms or non-electronic forms (p. 32).

Distance education is a planned educational method that aims to minimize lack of education, offers opportunities to geographical education differences between teachers and learners and much more. Technological advancements have helped distance education improve drastically since distance education came to practice more than 250 years ago. Technology is defined in Merriam-Webster's (n.d.) online dictionary as "a manner of accomplishing a task especially using technical processes, methods, or knowledge." Kaplan and Haenlein (2016) state that distance education

history can be categorized according to the media firstly as printed materials then tv and finally internet. Correspondence education where printed materials would be sent through mail services, can be called the beginning point of distance education; the traces of first distance education implementations can be found in 1728 when Caleb Phillips gave an advertisement in Boston Gazette for shorthand lessons, for which he would send the instructions through mail services (Demiray & İşman, 2003). In 1858 University of London became the first university to offer degrees through distance education (University of London, n.d.). Correspondence education continued expanding, helping many individuals further their intellect and skills (Kentnor, 2015).

The invention of radio contributed greatly to distance education; in 1920's 176 broadcasting stations were situated in educational establishments (Demiray & İşman, 2003). Later on, with the advancements in the technological departments, televisions began to be a part of distance education, by 1966 there were 632 channels (Kentnor, 2015). The well-known tv show Sesame Street which has first aired in 1976, can be shown as a distance learning example which uses television as its delivery tool (Kaplan & Haenlein, 2016).

The arrival of the Internet and World Wide Web was the third milestone in terms of media usage in distance education. The first attempt was in 1989 by University of Phoenix, which offered online programs (Kaplan & Haenlein, 2016; Kentnor, 2015). The presence of Internet and advanced computerized technology facilitated the interaction between students and instructors. The interaction as a two-way communication through video-conferencing tools has helped closing the gap between the learner and the instructor in distance learning.

There are other aspects than technology that can make learners prefer distance learning such as flexibility in time and space, access to life-long learning, the presence of alternate ways of learning from traditional ones, flexibility for students with disabilities (Williams et al., 1999, p. 7). Distance learning can be delivered as synchronous or asynchronous modes. Synchronous mode is scheduled, the learner and the instructor join the lesson at the same time whereas in asynchronous mode the learner can join the lesson any time. The combination of two is also used in numerous institutes today, which is named blended or hybrid learning.

The first known distance education applications in Turkey were first applied through mail and in 1968 with the advancements made in technology, educational programs were broadcasted from Turkish Radio and Tv corporation's network channel (Özbay, 2015). The phases of distance education which were mentioned in the previous chapters can be observed in Turkey as well. Bozkurt (2017) divides distance education in Turkey into four according to the media used as;

Discussions and Proposals (1923- 1955)

Correspondence education (1956- 1975)

Through audio-visual tools (1976- 1995)

Information technology based (1996- …)

In 1973 Television and Education Institute was formed under the roof of Anadolu University. In 1982 Anadolu University's Open University became the first university to offer open and distance education in Turkey (Bozkurt, 2017). After its start around late 1990's and web-based distance education gained importance with the 2000's and continued improving until today.

As it offers flexibility in time and space; there are a lot of programs offered with distance education methods in Turkey, especially in higher education. Rules and

procedures for distance education in higher education institutes are determined by CoHE in Turkey. Today a large number of public and private universities offer higher education programs such as business, journalism, economy, banking and finance and many more through distance education. Some of these universities can be listed as, Istanbul University, Beykent University, Ankara University, Marmara University. Distance education has come along a long way since its first arrival, and it is well known as a choice in education systems; strategies and implementations from distance education has helped linking instructors and learners during the challenging ERT period.

Emergency Remote Teaching

Keeping a conversational distance, touching contaminated places, spending time in crowded indoor places are some of the causes of transmission and spread of the virus as stated by WHO (2021). Because of the virus' nature, measurements taken during the pandemic involved separating the learner and the instructor into different environments to reduce the spreading of the virus. Even though many of the instructors have been unfamiliar with its teaching strategies, the limited preparation time and lack of infrastructure in some institutions, distance learning methods have helped teachers stay connected to learners and continue education to an extend during unprecedented Emergency Remote Teaching period.

Hodges et al. (2020) define Emergency Remote Teaching as;

> a temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances. It involves the use of fully remote teaching solutions for instruction or education that would otherwise be delivered face-to-face or as blended or hybrid courses and that will return to that format once the crisis or emergency has abated (p. 1).

The most significant difference between distance education and the ERT can be stated as the temporary nature of the ERT which is enforced in crisis situations.

Distance education is a carefully designed method which contains fundamental elements such as thought-out assessment techniques, proper regulations and suitable pedagogical approaches. Whereas Emergency Remote Teaching is imitating face-to face education through distance education with the aid of technological tools in emergencies (Sezgin, 2021).

"During COVID-19, participants experienced a focus on the method of delivering instruction rather than the learning goals, leading to uncertainty around assessment for both teacher and student" (Whittle et al., 2020). Hodges et al. (2020) state that the ERT requires rapid decisions, and it should not be compared to normal online courses since developing a proper quality course requires months. Synchronous and asynchronous video communication tools have been used during the ERT period and both methods contain certain challenges and benefits (Lowenthal et al., 2020). During the beginning of the ERT period, to avoid learning loss, institutes rapidly transitioned to remote systems, mostly using synchronous video communication tools such as Zoom, Microsoft Teams, Google Meet (Barbour et al., 2020).

Technological, pedagogical and social challenges have been observed during ERT practices and some of them can be listed consecutively as internet access and speed problems, inequalities with electronic devices; challenges with teaching methods and technological skills; interaction problems between instructors and learners (Ferri et al., 2020). Instructors faced difficulties when developing content, deciding on which technology to use and how to effectively teach with them; ethical concerns about personal data usage arose; parents faced problems when their roles have changed drastically and furthermore on psychological level stress and depression were one of the most common notions when researches were observed

(Sezgin, 2021). In K12, pre-school and early childhood contexts parents also got involved in the education process and they had taken on the roles as a facilitator during the ERT period as all the education took place via technology in which the students usually needed assistance. Furthermore, supervision to ensure the learning process, assistance in using technology and staying in touch with the teachers became some duties of parents. As this is the common case for students of younger ages, with older students' parents' role differed, for example the type of the supervision changed into monitoring from assistance.

Even though distance education practices are offered in some institutions in Turkey, education is mostly delivered through face-to face systems, in a learning environment where instructor and learner interaction is physically possible. After the declaration of the pandemic on March 2020, Turkey adjourned traditional face-to face teaching system starting from March 16 and continued education with distance learning strategies under Emergency Remote Teaching model on March 23 and ERT period continued until the end of the spring term 2019-2020.

In K12 context, EIN, Education Information Network has played a major part during Emergency Remote Teaching. In the beginning phase of ERT period, EIN infrastructure was reinforced, a control center was built for monitoring and improving the system. Three tv channels were formed under EIN network to provide access to educational videos (MoNE, 2020b). 8 gigabytes of free internet usage were provided for EIN users on a monthly basis. According to MoNE statistics, between March 23rd, 2020, and June 19, 7,383,213 students and 1,030,516 teachers actively used the system, and 5,954,174 live lessons were conducted (MoNE, 2020d).

Teachers and instructors were given the choice to conduct live lessons through EIN system, some private schools used their own infrastructures and tools to

continue teaching. In Alper's (2020) study where he investigated a private school's operations during ERT period, synchronous and asynchronous lessons were scheduled through Moodle platform, video materials were prepared by teachers and homework was uploaded to Google classroom. Special regulations were also made for spring term of 2019-2020 academic year, MEB announced that all report cards would be given in electronic forms and students would only be accountable for their fall semester grades.

"During the COVID-19 pandemic higher education institutions have faced many challenges, and among these are questions about how best to offer instruction in the face of sudden and mandatory college closures" (Major, 2020, p. 1). As for Higher education, education continued in the form of distance education starting from March 23rd. Evaluations and planning regarding pandemic and distance education solutions were made by CoHE, Turkish universities worked keenly, and a great number of universities transitioned to distance education strategies rapidly. Advisory Commissions on Pandemic were formed in universities, CoHE Courses Platform System was put into service; similar to EIN system, 6gb of free internet usage was provided for accessing CoHE Courses Platform (CoHE, 2020a). One week after its launch, an average of 50 million learners reached the system and 68 percent of the visits were accessed from a mobile phone; content from İstanbul, Atatürk, Anadolu and Universities were uploaded to the system and later on Middle East Technical University's books and video materials added (CoHE, 2020a).

Universities continued distance education through developing their systems; according to CoHE statistics, during ERT period 187 universities in Turkey offered 663.808 classes with distance education 90 percent of spring semester lessons were offered through distance education and synchronous video lessons were conducted in

22 percent of these lessons; social sciences had the highest number of distance education applications whereas health sciences had the lowest. Technical and pedagogic support were provided to relevant parties and online training programs were offered (CoHE, 2020b).

Regulations were also made, and certain rights were entitled to learners. Alternative online access options were offered to learners who do not have sufficient tools or infrastructure; all students were given the right to suspend their education and graduate students were granted extra time upon request through CoHE's announcement on April 1st, 2020. It was announced that higher education institutions exam would only include first semester syllabus. Alternative ways for face-to-face assessments were modified according to the necessities of the pandemic. CoHE presented main principles of digital based examinations on May 27th, 2020; digital examinations in the assessment included implementations such as projects, homework, learning management system activities and analytics, supervised or unsupervised online examinations including open-ended or multiple-choice questions. Inspectibility, transparency, validity and reliability were main considerations of these examinations.

Reviews From All Around the World on ERT

Two years have passed since the start of the pandemic and Emergency Remote Teaching period and academics, scholars and institutions continue gathering information, observing impacts, and working on possible improvements. While the investigation continues, there has been several literature reviews attempted to put the existing work of other academics into a frame.

Huck and Zhang's review of 2021 examined 226 studies from USA in K12 context and some of the findings included learning loss, the need for teacher support,

inequities in accessing technology and positive points such as improved technical skills and teachers' self-efficacy level. Butler-Henderson et al., investigated and assessed the quality of 138 articles dating between January 1 and assessed the articles according to their qualities and categorized them as poor, low, medium, high to provide support for future research. Crompton et al.'s (2021) research demonstrates that a variety of technologies were used during ERT period.

Abu Talib et al. (2021) analyzed 47 articles in their review. They have located main themes such as, impacts on education and students' experiences. Inaccessibility, technical difficulties, digital literacy, student participation were amongst the disadvantages located when conducting their research. Positive themes were also found during their research such as; flexibility of time and space and decrease of educational costs.

Perhaps one of the most recognized studies can be stated as Bozkurt et al.'s 2020 research which has been cited 805 times. They analyzed case studies from 31 countries and presented a 'global outlook' in K12 context during ERT period, remarking themes such as digital divide, parents changed roles, trauma and anxiety, inequity, data privacy, alternative assessment methods.

In Bond's review on K12 context of 89 studies (2020) ICT skills and knowledge, support by teachers, parents support, access to technology, infrastructure and students' well-being were amongst some of the themes found with Zoom as the most preferred online tool followed by synchronous collaboration tools.

Bond et al. (2021) investigated 282 studies from higher education level and found out that a large portion of the studies focused on students' experiences and quantitative studies were the most frequent ones. A great deal of the articles in the

review focused on online learning and students' views. Synchronous collaboration tools such as Zoom were amongst the most preferred online tools.

Sezgin's review of 2021 focused on 152 articles from 2019-2020 which were conducted during ERT period. The articles investigated in his study are mostly on higher education level and concludes that distance education activities are highly technology and digital skills based. Some of the negative aspects encountered in the studies can be listed as digital divide, techno-pedagogical inexperience and negativities regarding online learning, challenges with content design quality and distance education management, economic difficulties, pandemic psychology, health and family limitations.

CHAPTER 3: METHOD

Introduction

A useful step for developing or improving a strategy needs to start with a solid understanding of the current situation. As Xiao and Watson stated in their 2019 article "knowledge advancement must be built on prior existing work" (p. 93). When the literature was studied, there were studies done on ERT period in Turkey, but none focused on bringing all the research together to provide better insight. Therefore, a systematic literature review was conducted to be aware of the changes within the teaching-learning cycle during the ERT period in Turkey; to pinpoint points that can be improved; to provide a demographic data and to aid further research.

This chapter consists of the methodological steps that are followed when conducting the research by following systematic literature review criteria. First the research design is explained, and its importance is discussed. Then the context is defined, and the research's sample is specified under the heading "Sample". Under this heading Boolean search query and other criteria for locating relevant articles are included. Following this heading, instrumentation of the research is explained. The method of data collection and search strategy is also defined under relevant headings. Finally, method of data analysis for the study and its validity and reliability are discussed.

Research Design

This study's main research method is a systematic literature review. The review is conducted to demonstrate answers to the research questions stated in the

research questions section and to provide detailed insight to better understand the changes within the teaching-learning cycle resulting from phenomena on a certain time period in education by categorizing and synthesizing the related content. Gaining insight to a recent phenomenon can be strongly achieved through learning all the relevant data; its variables, causes and impacts and so on. A systematic literature review design enables the researchers to mine the target literature in a very detailed way to examine all the components. Therefore, a systematic literature review is a suitable method to achieve that goal; since it ensures presenting all the research that can be found in the literature is brought forward.

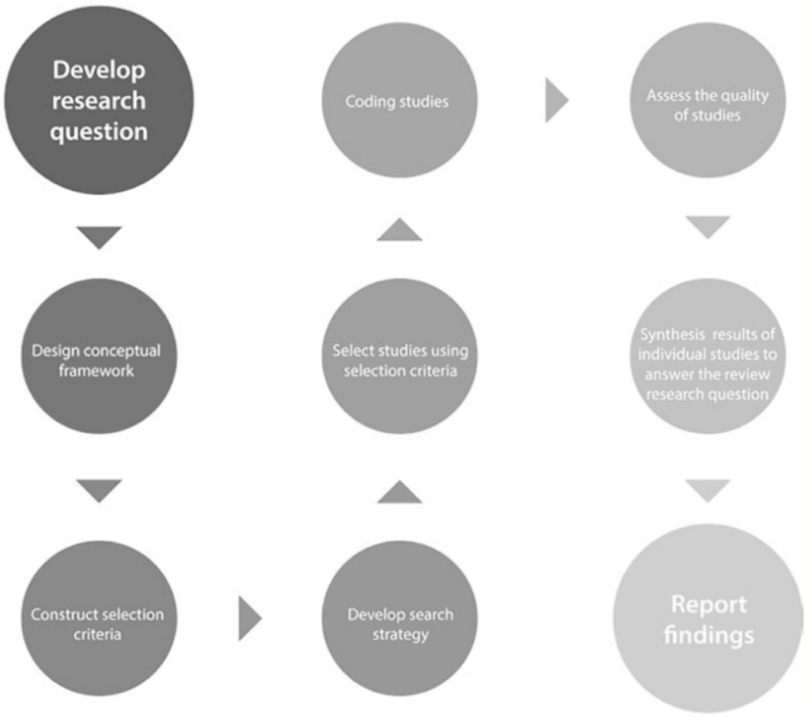
This review has qualitative elements, therefore making a qualitative systematic review (Snyder, 2019). According to Bogdan and Biklen (1998) qualitative research are used to understand people's behaviors and experiences. This research was conducted to understand the Emergency Remote Teaching period in Turkey; therefore, it is vastly related to people's experiences during the ERT period. To systematically frame the research first a rigorous search strategy is followed when collecting the sample, secondly a qualitative method, content analysis is followed when synthesizing and answering the research questions.

Qualitative content analysis can be followed when a researcher wants to reveal the meaning hidden behind a text; this is achieved through systematically categorizing and sorting the contents into topics or themes relevant to the aim of the research (Williamson et al., 2018). Gough et al. argue that there are three general steps when conducting a systematic review. They explain that the review process starts with step one "identifying and describing the relevant research" then continues with "critically appraising research reports in a systematic manner" and reaches an end by "bringing together the findings into a coherent statement" (Gough, 2012., p.

5). Following these steps, a more detailed search strategy was chosen from Systematic Reviews in Educational Research and the nine steps of the process can be seen in Figure 4 (Newman & Gough, 2020).

Figure 4

The Systematic Review Processes



Note. Taken from "Systematic Reviews in Educational Research: Methodology, Perspectives and Application", by M. Newman & D. Gough, in Zawacki-Richter et al., (Eds), *Systematic Reviews in Educational Research: Methodology, Perspectives and Application* (p. 6), 2020, Springer VS. Copyright 2020 by Mark Newman and David Gough.

The first steps of the systematic review start by determining research questions and focusing on the conceptual framework. Research questions are of the utmost importance because they are the key elements when shaping the structure of the study. "Qualitative questions usually inform the direction of the study in both theoretical and methodological terms" (Agee, 2009, p. 442). Agee also argues that when designing research questions, researchers need to consider their time limitations and resources, the broadness of the questions and wording when forming the questions as they determine the study's focus. Research questions contain certain assumptions, and the conceptual framework aids the researchers in understanding

these assumptions, explaining the significant points, variables, and their relationships within the study (Newman & Gough, 2020).

The process continues with the selection criteria, that is determining the rules for article selection. These rules limit the review in relation to research questions and set systematic steps. Then the search strategy is developed. The search strategy is concerned about deciding the source databases for locating articles or other types of data sets and how the researcher selects relevant articles. It is a common practice to use keywords to detect articles in search databases. Following this step, studies are picked using selection criteria and they are checked to guarantee that they are appropriate for the criteria. After finding studies that meet the relevant criteria, the researcher moves on to coding studies. Coding of the data enables to present the characteristics such as methodology, participants, sample size, etc. To present this data systematically and to reach it easily, the data is usually preserved in a data collection system. The next steps following the coding are assessing the quality of studies and synthesizing the results of individual studies to answer research questions. When assessing the quality elements such as the relevance of the articles, their trustworthiness and execution of the methodology are investigated.

The researcher continues with synthesizing the data found in the reviewed articles. According to Bui, when a researcher reaches the end of his/her qualitative study, they record lots of data. These data need to be categorized and put into order to find answers for the related research questions (Bui, 2009). Synthesizing becomes possible by examining the results or findings of the studies by considering elements such as characteristics and methodology then the researcher seeks answers to the research questions. Eventually, interpreting findings, combining them and reaching a final decision forms the reporting of findings section.

Sample

This study is concerned with Emergency Remote Teaching that took place during COVID-19 period in Turkey. Therefore, the sample consists of the scholarly articles that were acquired from Scopus, ERIC and DergiPark databases using the keywords and Boolean search strings. The keyword set designed for this study comprises the following; "Emergency Remote Teaching" OR "Emergency Remote Education" OR "Emergency Distance Education" OR "*Acil Uzaktan Eğitim*" for Scopus and ERIC databases whereas for DergiPark which is a Turkish database, only "*Acil Uzaktan Eğitim*" OR "*AUE*" were used. Journal articles that are in English and Turkish languages are selected according to the relevant coding referred to above. Articles that date between 2020-2022 are selected as the ERT period started on March 2020 in Turkey.

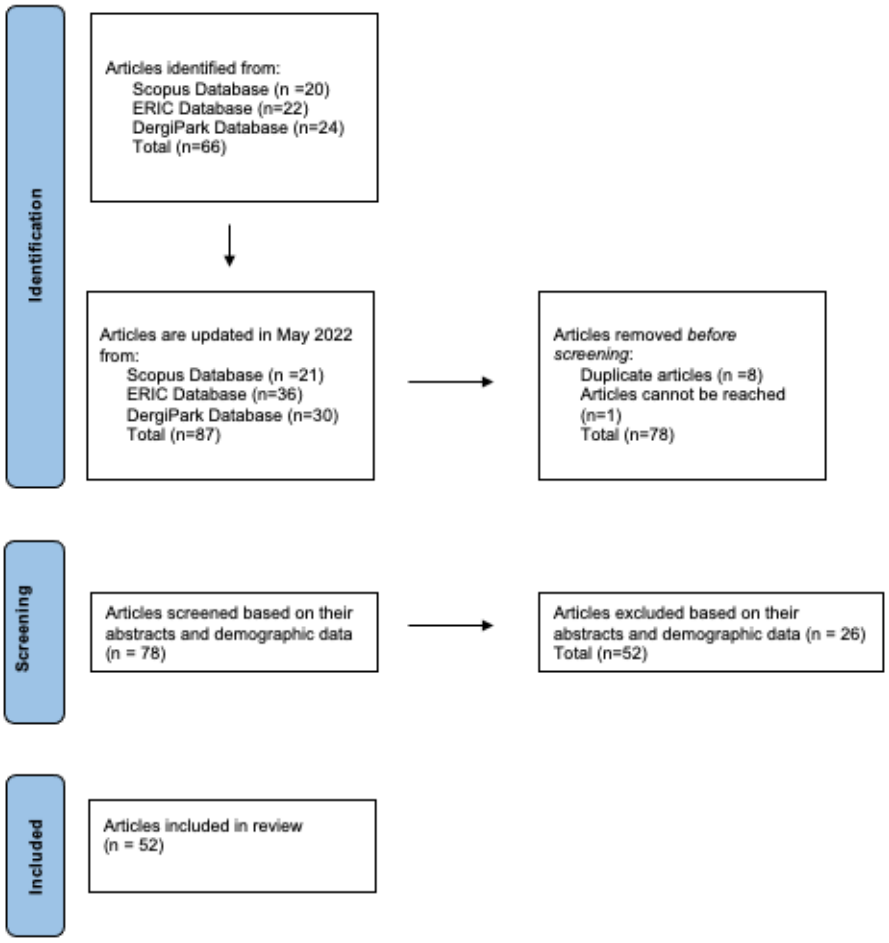
At the start of the search a total number of 20 scholarly articles from Scopus, 22 articles from ERIC database and 24 articles from DergiPark were found using the designated search string in February 2022. To update the review the Scopus, ERIC and DergiPark databases were scanned using the same search query in May 2022 to add recently published articles. After scanning a total of 21 articles from Scopus database, 36 articles from ERIC database and 30 articles from DergiPark database were counted as the study's overall articles. One article could not be reached, making the total number of articles 86.

Following the PRISMA diagram (See Figure 5), the duplicates were removed, leaving 78 articles. To continue the process, articles were screened based on their abstracts, demographic data and their relevance to the selection criteria of the sample of the articles. Regarding to Research question number 2, articles which contain data from students and instructors are selected. Articles containing parents,

school administrators, field experts and examination of infrastructures were eliminated. K12 and higher education contexts were also determined as selection criteria and articles containing early childhood were excluded. After the mentioned exclusion criteria were applied a total of 52 articles were determined as this review's sample articles.

Figure 5

Research Article Selection Process



Instrumentation

A Microsoft Excel spreadsheet was used to create tables that are necessary when conducting the systematic literature review. The tables have headings that are used to categorize articles. Categories in the tables have headings which aimed to classify the characteristics of the articles such as; title, author(s), year of the

publication, name of the journal, research methods, data collection tools, size of the sample, level of the sample, sample type, reference type, digital platforms and curricular area. Other than the common characteristics, which can be mutual in most of the systematic research, some special headings were generated for this study to help find solid answers to research questions. They were named as reference type of the keyword (ERT, ERE, EDE or AUE), digital platforms and curricular area.

Method of Data Collection

Scopus, ERIC and DergiPark databases were used to locate findings that align with the designated keywords and inclusion and exclusion criteria were used to collect data when constructing selection criteria which were explained under the Sample heading, resulting in the final number of 52 articles. The demographic data were harvested from the sample section of each article about their year of publication, journal name, research methods, data collection tools, size of the sample, level of the sample, sample type, reference type, digital platforms, and curricular area. They were presented under tables to provide demographic mapping in Chapter 4. Through demographic mapping, it was aimed to provide a clear presentation of frequency for significant characteristics.

The results of the second research question regarding the changes within the teaching-learning cycle were obtained through the results and discussion part of each sample article. The referred sections are first scanned for changes, then carefully investigated. For each article the changes were highlighted on the document, then put on a list using a Microsoft Excel spreadsheet. As the final step, the changes are put together under selected headings in Chapter 4 to provide an overlook and synthesized again in the results section to review and display significant results.

Methods of Data Analysis

The data analysis of this systematic literature review was conducted through qualitative content analysis. “Coding, collecting codes under potential subthemes or themes, and comparing the emerged coding’s clusters together and concerning the entire data set comprise the main components of data analysis” (Vaismoradi et al., 2016, p. 101). Therefore, based on this definition, the data analysis was conducted through coding and synthesizing. The steps in the systematic review process by Newman and Gough (2020) which can be observed under the research design heading, were implemented.

The Coding of Studies

The coding of studies is the step that is followed by selecting related studies. The procedure consists of locating and categorizing useful data which can be used when answering the research questions (Newman & Gough, 2020). At this step articles were carefully studied, and meaningful evidence-based data that are relevant to the aim of the research are located. The studies were first categorized under demographic headings of title, author(s), year of the publication, name of the journal, research methods, data collection tools, size of the sample, level of the sample, sample type, reference type, digital platforms, and curricular area. Then the articles are carefully investigated for changes within the teaching-learning cycle during ERT period to answer research question number two.

Assessing the Quality of Studies

The identified studies based on the coding scheme are assessed according to their usefulness when finding answers to the relevant research questions. The validity and reliability procedures indicated in the articles were also taken into consideration under this step.

Synthesis and Reporting Findings

The data that are collected from each study at the previous steps are examined to find out whether they provide answers to the relevant research questions. Content analysis methods such as coding, grouping, comparing, and synthesizing were followed during this step. “The reviewed articles must be grouped in a meaningful way to guide the reader toward a better understanding of the focal phenomenon and provide a foundation for insights about future research directions” (Palmatier et al., 2018, p. 4). Irrelevant data were taken from the results to avoid confusion and misleading results.

Validity and Reliability

The literature review indicates the results, effects, and characteristics of research in the target literature. Validity and reliability are two essential features of a systematic review. “Reliability and validity are conceptualized as trustworthiness, rigor and quality in qualitative paradigm (Golafshani, 2003). Selection bias can occur when authors tend to choose only the studies which may align with their results (Nightingale, 2009). To avoid this bias, articles are selected through selection criteria, which were explained under the Sample heading. Articles are only excluded regarding to their demographic data. The exclusion criteria and the search query were presented in this research to provide replicability. No articles were removed according to whether they supported the research questions or not.

Review bias can be counted as a threat to the validity of a systematic review. To improve the trustworthiness of the research, Creswell, and Miller (2000) suggest many procedures, one of which is used for this research, peer reviewing and defines the procedure as “reviewing the data and research process”. In addition to validity, threats to reliability are also significant in review processes. Intercoder reliability

(ICR) primarily contains this procedure and was used to check the credibility of this research. According to O'Connor & Joffe (2020) two independent coders are necessary to conduct the ICR process. For this study, two independent coders from a different university who have MA degrees in education were selected. First the coders were provided the study material to gain into the subject. Then 10 % (n=5) of the studies were randomly given to the coders. O'Connor & Joffe suggest in their 2020 article that 10-25% of the data would be sufficient for coders to review. A coding scheme was created through a Microsoft Word document to present a clear and structured analysis (See Appendix B). Using articles and the provided coding scheme, coders were asked to complete the ICR process. As a result, an 80 percent agreement between coders was reached. As the final step a discussion session was organized to exchange ideas and reach a mutual agreement.

CHAPTER 4: RESULTS

Introduction

This chapter intends to provide a deeper understanding of the study's characteristics, findings, and important elements to provide answers to the research questions stated in the previous chapters. The related information is submitted in detail with the aid of tables and figures.

Findings of the Study

Under this heading results of 52 studies that correspond to the selection criteria (See Appendix A) are presented and categorized with demographic data according to the author(s), year of the publication, research methods, data collection tools, size of the sample, level of the sample, sample type, reference type, digital platforms and curricular area covered in articles. Then to present an answer to the second research question positive and negative impacts of the ERT period are located. Suggestions referred to in the study's articles are gathered under the suggestions heading to provide an answer to the last research question.

The Characteristics of the Study's Sample on Emergency Remote Teaching in Turkey

Year of the Publications

Table 1 exhibits the year of the publication of the research articles. The timeline selected for the search criteria which was used when locating articles starts from March 2020 to May 2022.

Table 1

Research Articles by Years

Years	f
2022	14
2021	31
2020	7

Table 1 shows that the highest number of publications is in 2021 (*n*=31). 2021 is the year after the outburst of the pandemic therefore most of the research done during the pandemic period are calculated, prepared, and published during this year. 2022 has 14 publications however, this study includes 2022 until May.

Research Methodologies

The table below contains the research methodologies of the study's research articles. They are categorized as quantitative, qualitative, and mixed.

Table 2

Research Methodologies of the Research Articles

Methods	**f**
Quantitative	7
Mixed	13
Qualitative	32

Table 2 shows that qualitative research was the most preferred amongst the studies, followed by mixed methods. There are no unspecified research methodologies present in the research articles.

Data Collection Instruments

Different data collection instrumentations are present in the research articles. They are categorized as interviews, surveys, questionnaires and other under Table 3.

Table 3

Distribution of Instruments of the Research Articles

Methods	f
Interview	22
Questionnaires	20
Surveys	12
Test scores, observation, content analysis, reports, scale	5

Interview design is used in twenty-two of the articles, making the design the most preferred one. Surveys are used as data collection tools of quantitative, qualitative, and mixed methods in twelve research articles in the current study. In the current research, there are seven quantitative surveys presenting numerical data and four qualitative surveys which are mainly concerned about meaning. Questionnaires (*n*=20) are used as a means of gathering data through written questions and in the current study they are the second most preferred data gathering tool. The last section of the table consists of five instruments under the headings of Scales, Observations, Test scores, Content analysis, Reports, Data collection through metaphor. Each of these data tools are categorized separately as they are only used once.

The Sample Type of the Study

The sample type of the study consists of two categories: students and teachers. The articles are divided into these categories to present the perceptions of the most two essential components in education, students, and teachers/instructors.

In the research articles, students (*n*=28) have the largest proportion in the distribution of sample types. Teachers and instructors are another essential part of the

education process and there are twenty-four articles focusing on their reflections and experiences in the study's research articles.

Table 4

Distribution of the Sample Type of the Research Articles

The Grade Level	f
Students	28
Teachers/Instructors	24

The Grade Level of the Sample of the Study

The grade level of the article's sample of research numbers are presented under Table 5. They are presented as subheadings under students and teachers.

Table 5

Distribution of Grade Level of the Sample of Research Articles

The Grade Level	f
Students	
K12	1
University	27
Teachers/ Instructors	
K12	16
University	8

As shown in Table 5 was studied, the highest number of studies come from students of higher education, followed by students of K12 level.

Sample Sizes

The sample size of the research articles examined is reported in Table 6.

Table 6

Distribution of Sample Sizes of the Research Articles

Sample Size	f
1-20	14
21-40	6
41-60	5
61-100	7
101-200	6
201-400	6
401-3975	8

Sample sizes of the research differ between 1-3975. Small scale research of 1-21 are the most chosen one by the researchers, resulting in %26 of the total articles. The lowest number recorded amongst the studies is one, obtained from a K12 teacher through observation, reports and an interview. On the other hand, the second most preferred one is between 401-3975, with a percentage of %15 of the overall articles. Small scale ones are mainly quantitative ones involving participants reflections, whereas research with sample sizes between 401-3975 consists of quantitative ones with numerical data. The highest number in the sample sizes recorded amongst the studies is 3975, collected with a questionnaire from university students through quantitative research.

Subject Areas Covered in the Research Articles

The subject areas in which ERT took place were presented under Table 7. They are presented as subheadings under K12 and University. In K12 setting they were categorized into groups as Classroom, Science, Mathematics, Turkish, English and Mixed. In University setting they are categorized as Mixed, Education, English Language Courses, Arabic and Theology, Unspecified.

Table 7

Subject Areas Covered in the Research Articles

Subject Areas	f
K12	
Classroom	5
Mixed	5
Unspecified	3
English	2
Science	1
Mathematics	1
Turkish	1
University	
Education	16
Mixed	11
English Language Courses	4
Unspecified	3
Arabic and Theology	1

Digital Platforms

During the Emergency Remote Teaching period, technological devices and digital platforms helped when forming virtual classroom environments and made the connection between teachers and students possible. The connection between learners and instructors was made through online platforms on devices such as computers, tablets, or mobile phones. The type of technological device was also significant; in an examined study from higher education context, students who used computers and tablets showed more positive attitudes than users of mobile phones (Güler et al., 2022).

Students expressed that they were able to use plenty of resources and tools online (Karataş & Tuncer, 2020; Öncü & Kırcı, 2021). Through the use of these vast

online tools students expressed that their digital literacy skills had improved (Ağçam et al, 2021, Tatlı et al., 2022; Özüdoğru, 2021). Teachers of higher education stated that during ERT presenting audio and visual content were easier (Toraman et al., 2021).

The digital platforms which are used during the education process in ERT period are categorized under the table below.

Table 8

Distribution of Digital Platforms Used in the ERT Period

Digital Platforms	f
Zoom	23
Unspecified	22
Learning Management Systems	18
WhatsApp	12
EIN	11
Twitter, Instagram, Kahoot, Google Hangout, Google Forms, Quizizz,	8
YouTube	6
Microsoft Teams	4
Skype	4
Facebook	3

Zoom is listed as the most preferred technological platform in the research articles, present in approximately %20 of the articles. Zoom is a video communication tool that can be used in synchronous or asynchronous distance education and enables users to interact with video, audio, or chat. In one of the examined studies, students expressed that they were generally positive about videoconferencing tools used during ERT period (Bilgiç, 2021). Microsoft Teams and Skype were also used as a means to conduct video lessons; higher education

teachers expressed that they were content using the Microsoft Teams application (Durak & Çankaya, 2020b).

It is seen that the WhatsApp application was mentioned in 12 of the articles. In most of these articles, the participants state that they used the application to make and receive announcements. WhatsApp is also used as a tool to share materials and content during ERT period. According to the examined articles of this study, in K12 context communication with parents was often made via WhatsApp application. The application facilitated interaction between parents and teachers, but some negative sides were stated as well. Teachers stated that they had to send texts for continuity of assignments and respond to messages until late hours (Tatlı et al., 2021; Uysal, 2021).

A content source referred in most of the articles was YouTube. At K12 level, the most common platforms are found out as EIN, Zoom and WhatsApp. Teachers stated that they were able to track students' learning through statistics provided by EIN system (Ünal & Bulunuz, 2020). Classroom teachers expressed that they used EIN system for evaluation and Whatsapp for communication (Tatlı et al., 2021).

At the university level, Zoom, LMS, and WhatsApp are the highest digital platforms. Regarding higher education LMS, in an examined study, learners from a university referred that they had trouble with using their universities distance education systems, they found them highly complex to use (Durak & Çankaya, 2020). For the other category, eight articles are present as Twitter, Instagram, Kahoot, Google Hangout, Google Forms, Quizizz, Learning App, and Paint.

Changes Occurred in the Teaching-Learning Cycle During Emergency Remote Teaching Period

The emergency remote teaching period called for a rapid transition to digitalized remote education systems, therefore institutions were not prepared (Karataş et al., 2021). Even though there were problems with the transition, the implementation of the ERT period with online tools was perceived positively as it is a means to continue education (Baran & Sadık, 2021; Sekreter et al., 2021). Other than continuity, teachers and instructors found certain aspects of distance education fruitful. Since flexibility in time and space can be achieved through distance education methodologies, K12 students who had experienced distance education for the first time realized that distance education could be an alternative to the traditional systems and related distance education with life-long learning (Bozkurt, 2020). Higher education students perceived the flexibility of time and space of distance education as an advantage (Aksoy et al., 2021; Göksel, 2022; Öncü & Kırcı, 2021; Yurdakal & Susar, 2021). Transitioning to fully online classrooms from home environments during the ERT period allowed students to have more free time (Ergüleç & Eren, 2021; Karataş & Tuncer, 2020; Öncü & Kırcı, 2021; Özüdoğru, 2021). Learners thought that accessibility was a positive factor and university students were pleased that they were able to access materials from anywhere and from any device (Ergüleç & Eren, 2021).

While the concept of using distance education measures was received as a convenient way to keep learners and instructors connected and some aspects of it were found satisfactory, many parties involved in the education process faced challenges during the ERT period when shifting to fully online classes as it was a completely new situation. The period was a valuable learning chance as it affected

many components and variables of the teaching-learning cycle, which resulted in various changes regarding students and instructors of K12 and higher education levels.

The changes in the variables are located through the content analysis method and categorized under subcategories which are determined from Huitt's (1995) framework of the teaching-learning process (Figure 1) and adapted slightly for a more comprehensible and suitable categorization. As it was stated in Chapter 2, the framework consists of four components; *Context, Input, Classroom Processes and Output.* Therefore, the articles are investigated for changes to these components as changes related to context, changes related to input, and changes related to classroom processes. However, instead of changes to output, a component of output category is selected, and changes related to measuring student learning, which is a frequent pattern in the articles, are investigated.

Changes Related to the Context

The factors which are exterior to the classroom environment are discussed under this heading. When the articles are examined, school characteristics and home environments had the main influence under context variables. Because of the ERT period where education had to be continued through online systems, the physical characteristics of the classroom environment had changed, separating learners and instructors into their home environments. When home environments got involved in the teaching-learning process, certain variables became important which normally would be under the control of the school administration or would be related to the school facilities. Some of these variables can be named as distractors caused by unsuitable teaching-studying environments and inequalities in possessing required technology.

Having shifted to an unplanned method of delivery through online digital tools in a very short period, certain constraints were observed from changes in the context variable. Some of these constraints start with inequalities in the possession of technical tools. Deficiency of technological tools during the ERT period was reported in two of the studies (Baran & Baran, 2021; Özen & Abdüsselam, 2021). Students from higher education stated that they faced problems because they did not have a computer (Ağçam et al., 2021; Durak & Çankaya, 2020; Ergüleç & Eren, 2021; Karataş & Tuncer, 2020; Sen-Akbulut, 2021; Özüdoğru, 2021; Taşkaya, 2021; Yazgan 2021; Yurdakal & Susar, 2021) or their computers were old (Karataş & Tuncer, 2020) or they had to share a computer with the household members (Ağçam et al., 2021; Öztürk, 2021). In K12 context, younger students expressed concern that distance education's technology-based nature creates inequalities amongst students (Bozkurt, 2020).

Students having technical problems were observed by K12 teachers (Şen & Genç, 2022; Yıldız, 2021). Some of these technical problems were internet connectivity which led to certain problems during the teaching-learning process of K12 context (Erbas et al., 2021; Yıldırım & Elverici, 2021; Yıldız, 2021).

Regarding the context variable in the studies, technical problems were one of the most common constraints for university learners too (Bilgiç, 2021; Karataş & Tuncer, 2020; Ortaş & Demir, 2022; Yurdakal & Susar, 2021; Tuncer & Karataş, 2022). In higher education, internet connection problems were also present in the studies focusing on learners (Ağçam et al, 2021; Balbay & Erkan, 2021; Bilgiç, 2021; Bilgiç, 2022; Durak & Çankaya, 2020; Ergüleç & Eren, 2021; Karataş & Tuncer, 2020; Özüdoğru, 2021; Taşkaya, 2021; Öztürk, 2021; Tatlı et al., 2022; Yurdakal & Susar, 2021). Power cuts also created problems for students of higher

education (Ağçam et al., 2021; Yurdakal & Susar, 2021). Research stated that because of technical problems some participants could not attend live lessons (Sen-Akbulut et al., 2021).

Teachers' experiences were not any different from learners. In the examined studies, teachers in K12 context reported that they experienced technical issues during teaching (Ardıç, 2021; Aslan et al., 2021; Saralar-Aras & Güneş, 2022; Yıldırım & Elverici, 2021). Similar to learners, internet connection problems discomforted higher education instructors too (Candan & Usta, 2022; Çardak & Güler, 2020; Erbaş, 2021; Nayman & Bavlı, 2021; Şen & Genç, 2022; Sekreter et al., 2021; Özen & Abdüsselam, 2021; Uzun et al., 2021; Yıldırım & Elverici, 2021). Other than the connectivity problems, instructors expressed that they faced technical problems with technological tools during ERT period (Çardak & Güler, 2020; Karataş et al., 2021). Problems resulted from the nature of videoconferencing tools such as; sounds overlapping, and not being able to see all participants at the same time (Durak & Çankaya, 2020).

Compulsory transforming of physical classrooms into online classrooms resulted in environmental changes in learning and teaching. Teachers' observations inferred that some students of higher education experienced constraints regarding their learning environment because of their socioeconomic levels (Sekreter et al., 2021). University students expressed that from time to time their environments were not suitable for studying or attending lessons (Ağçam et al., 2021; Bilgiç, 2022; Dolgunsöz 2021; Ergüleç & Eren, 2021; Özüdoğru, 2021; Yurdakal & Susar, 2021). Noise problems (Balbay & Erkan, 2021; Dolgunsöz 2021; Ergüleç & Eren, 2021; Karataş & Tuncer, 2020; Yazgan, 2021), existence of family members (Dolgunsöz, 2021; Ergüleç & Eren, 2021; Yazgan, 2021), environment-related distractions

(Balbay & Erkan, 2021; Dolgunsöz 2021; Ergüleç & Eren, 2021; Karataş & Tuncer, 2020) were some of the reported constraints. Being in a different environment resulted in problems such as higher education students experiencing extra workload around the house with household chores (Dolgunsöz 2021; Yazgan, 2021). Distractions caused by students' learning environments were also reported in studies in K12 context (Arslan & Şumuer, 2020; Kaygısız & Balçıkanlı, 2021; Şen & Genç, 2022). First-grade teachers expressed that students were not in suitable environments, which led to focusing problems (Erbaş, 2021; Uysal, 2021; Uzun et al., 2021). Shifting to fully online classes required students to spend long hours in front of screens. Resulting of transition to distance education methods, another issue emerged, which is the effect of the use of digital devices on health. Excessive use of digital tools impacted students' health negatively; students got concerned about their eye health (Ağçam et al., 2021; Karataş & Tuncer, 2020; Yazgan, 2021; Yurdakal & Susar, 2021).

Regarding the changes in the learning-teaching environment, a lot of parties stated that ERT period was advantageous economically since it helped reduce educational costs (Ergüleç & Eren, 2021; Karataş & Tuncer, 2020; Öncü & Kırcı, 2021; Yazgan, 2021). The disappearance of the necessity of commuting to school, living separately from families or in dormitories benefitted students economically. Students also expressed that staying at their homes was more comfortable (Ağçam et al., 2021; Durak & Çankaya, 2020; Ergüleç & Eren, 2021; Karataş & Tuncer, 2020; Yazgan, 2021). Pupils stated that they were positive about living with their families and getting their support (Öncü & Kırcı, 2021).

Changes Related to the Input

According to Huitt's framework (2003), input involves the attributes of students and teachers which are before the start of the lesson. The input category breaks down to the two major members of the teaching-learning cycle which are teachers and students. Under this heading firstly student characteristics are examined for changes in the variables such as motivation, study habits and learning style. Then teacher characteristics including teacher efficacy and way of delivery are investigated.

As the main objective behind the teaching-learning cycle is to successfully convey knowledge to learners, changes to student characteristics carry great significance. Furthermore, changes occurring to student characteristics might have vast influences on other variables such as Student Behavior.

Motivation is one of the key factors to accomplishing student achievement; the lack of an appropriate amount of motivation can hinder success even if the individual is exceptionally talented (Dörnyei, 1998). Students' psychological well-being is a major influence factor to their motivational levels (Yüksel, 2021). It is suggested that the pandemic resulted in '*negative emotional responses'* (Durak & Çankaya, 2020). Since the ERT period took place during the pandemic, learners were affected psychologically, and it reflected on their motivation levels in the teaching-learning cycle. Decreases in motivation levels were amongst the most reported changes to students' characteristics; in studies concerning higher education (Aksoy et al., 2021; Bilgiç, 2021; Çardak & Güler, 2020; Durak & Çankaya, 2020b; Tatlı et al., 2022; Yazgan, 2021) and in K12 context too (Arslan & Şumuer, 2020; Candan & Usta, 2022; Erbaş, 2021; Eroğlu & Şenol, 2021; Nayman & Bavlı, 2021; Sarıkaya, 2021).

Changes to learner habits were also found when the articles were examined. In the higher education setting, a lack of self-discipline (Ağçam et al., 2021; Aksoy et al., 2021; Balbay & Erkan, 2021; Durak & Çankaya, 2020; Karataş &Tuncer, 2020; Yazgan, 2021), failure at time control (Ağçam et al., 2021; Balbay & Erkan, 2021; Karataş & Tuncer, 2020; Özüdoğru, 2021; Yazgan, 2021) were reported.

Study habits of learners were another sub-category of student characteristics that went through changes during the ERT period. The difference within this category was that under this heading most of the reported changes were in favor of learners. The nature of distance education implementations gave students the opportunity to revise the course content through recordings or materials in higher education (Ağçam et al., 2021; Durak & Çankaya, 2020; Ergüleç & Eren, 2021; Karataş & Tuncer, 2020; Özüdoğru, 2021; Sen-Akbulut, 2021; Yazgan 2021; Yurdakal & Susar, 2021). Sharing of notes through digital platforms aided students when identifying the boundaries of the lessons (Yazgan, 2021). Students of higher education indicated that they improved their self-efficacy levels and their planning and evaluation had gotten stronger with distance education methods (Ortaş & Demir, 2022; Tatlı et al, 2022; Yurdakal & Susar, 2021).

The second category of Input variable consists of teacher characteristics. Under this heading, teacher efficacy is discussed. Teacher efficacy stands for “beliefs in their ability to effectively handle the tasks, obligations, and challenges related to their professional activity” (Barni et al., 2019). During the ERT period teachers who were not accustomed to teaching via technological and online tools struggled greatly when teaching. Teachers in K12 context and higher education mentioned that they felt inexperienced regarding online education (Baran & Sadık, 2021; Candan & Usta, 2022; Çardak & Güler, 2020; Uysal, 2021; Yıldırım & Elverici, 2021) and teachers

of higher education expressed that they lack necessary technical skills to conduct online learning (Baran & Baran, 2020; Erdem-Aydın, 2021).

Changes Related to the Classroom Processes

Classroom processes consist of everything that happen in the classroom and separate into two categories as teacher behavior and student behavior. Variables related to teachers' behaviors during lesson time are put into three main categories under the teaching-learning cycle planning, management and instruction. Similar to the teachers, students' behaviors throughout the lesson are investigated under classroom processes. Academic Learning Time which is a combination of content overlap, students' involvement and students' success is calculated as a significant variable under student behavior.

Classroom processes start with teacher behavior which starts with the planning step. During the planning step, content holds great significance as it embodies the key knowledge or skills that are determined in the lesson objectives. The sudden transition to distance education implementations during the ERT period troubled teachers when choosing appropriate materials for online systems. Teachers' digital literacy skills were not sufficient for online education and that they faced challenges when preparing lessons in K12 context (Eroğlu & Şenol, 2021; Yıldırım & Elverici, 2021). One of these challenges was reported as the absence of suitable content. First grade teachers stated that textbooks not being designed for the ERT period led to learning losses (Uzun et al., 2021). Teachers from a private school also mentioned not being able to find appropriate digital content (Yıldırım & Elverici, 2021) and teachers found digital content insufficient in K12 context (Arslan & Şumuer, 2020). In K12 context students felt lessons were lacking in terms of content and process (Bozkurt, 2020). Teachers sometimes had difficulties in defining the

boundaries of the topics; in the research articles students expressed that content of the lessons had gotten intense and their workload expanded (Ağçam et al., 2021; Aksoy et al., 2021; Bilgiç, 2021; Bilgiç, 2022; Ergüleç & Eren, 2021; Karataş & Tuncer, 2020; Özüdoğru, 2021; Taşkan, 2021; Yazgan, 2021).

The way of instruction also mattered greatly during the ERT period (Karataş & Tuncer, 2020; Özüdoğru, 2021). One-way static lecture type lessons were found to be less effective during the ERT period since communication is an important key factor in permanent learning. and students reported that instructors carrying out lessons only by uploading lecture notes lowered their academic achievement and motivation levels. For practice-based courses, students felt distance education implementations lacking (Öncü & Kırcı, 2021; Özen & Abdüsselam, 2021; Özüdoğru, 2021; Yurdakal & Susar, 2021). Teachers reported that they could not utilize different methods and teaching techniques and they used direct instruction and questioning as their main teaching method, resulting in teacher-centered activities (Aslan et al., 2021). Social presence and peer interaction differed according to the lessons design nature (Sen-Akbulut; 2021). Therefore, it can be stated that teachers' preferences over the materials they choose, and their way of delivery mattered greatly.

Interaction and satisfaction were positively correlated during lessons conducted in the ERT period (Balbay & Erkan, 2021; Yüksel, 2021). Lack of interaction amongst students-teachers was noted by instructors of K12 context (Ardıç, 2021; Baran & Baran, 2020; Eroğlu & Şenol, 2021; Kaygısız & Balçıkanlı, 2021; Uysal, 2021). In higher education context some students experienced problems when communicating with lecturers (Balbay & Erkan, 2021; Bilgiç, 2021; Durak & Çankaya, 2020; Karataş & Tuncer, 2020; Kukul, 2021; Taşkan, 2021; Öncü

& Kırcı, 2021; Özüdoğru, 2021; Yazgan, 2021) and they had problems getting feedback (Balbay & Erkan, 2021; Ergüleç & Eren, 2021; Karataş & Tuncer, 2020; Kukul, 2021; Taşkan, 2021; Tuncer & Karataş, 2022; Yazgan, 2021). Teachers also had difficulties in giving sufficient, individual, and instant feedback (Kaygısız & Balçıkanlı, 2021; Sarıkaya, 2021; Uysal, 2021).

Student behavior during lesson time is affected due to the sudden shift to online systems during the ERT period and the effective accomplishment of Academic Learning Time lessened. According to Huitt (2003), effective implementation of Academic Learning Time derives from students' actions of "covering important (tested/evaluated) content"; "being on-task most of the class period" and "being successful on most completed assignments" (p. 1).

In higher education students were reluctant and their interest levels were low (Karataş et al., 2021; Erdem-Aydın, 2021). Concentration problems were also reported in higher education (Karataş & Tuncer, 2020) and students did not participate sufficiently (Eroğlu & Şenol, 2021) The situation was not very different with students of K12 context too (Özen & Abdüsselam, 2021) and they were unwilling to participate (Aslan et al., 2021). Students lacked punctuality in attending courses during the ERT period too (Aslan et al, 2021) and some of them were absent in the live lessons (Ardıç, 2021; Aslan et al., 2021; Battal & Koşar, 2021; Sarıkaya, 2021; Tatlı et al., 2021).

Changes Related to Measuring Student Learning

The sudden shift to distance education implementations left teachers unprepared in terms of measuring learning too. Both K12 and higher education instructors experienced constraints in assessing their students' learning. K12 teachers had trouble with feedback and evaluation and assessment (Ardıç, 2021;

Battal & Koşar, 2021; Kaygısız & Balçıkanlı, 2021; Eroğlu & Şenol, 2021) and they had difficulties in checking homework (Baran & Sadık 2021; Uysal, 2021).

Instructors were uncertain about their evaluation and assessment methods at the higher education level (Durak & Çankaya, 2020b; Erdem-Aydın, 2021; Karataş et al, 2021) and they could not observe whether their students follow the lesson or not (Çardak & Güler, 2022). Furthermore, instructors found assessment and evaluation through their institution's system insufficient (Durak & Çankaya, 2020b). For assessment methods, teachers used homework assignments and quizzes (Aslan et al, 2021). At the higher education level, participants found authentic assessment, weekly quizzes, and practice tests were effective and helped them keep engaged during ERT period to some extent (Sen-Akbulut et al., 2021) and teachers also involved participation as an evaluation method (Aslan et al., 2021).

The examination was another issue for higher education students, most of them were not familiar to online exams and this created challenges as time management (Karataş & Tuncer, 2020). Exam security was also a concern and the absence of exam security led to misleading results (Aksoy et al., 2021; Balbay & Erkan, 2021; Yakar, 2021). Concerns about exam security were another issue (Durak & Çankaya, 2020b) and teachers stated that students found ways to cheat during exams and assignments (Özen & Abdüsselam, 2021).

CHAPTER 5: DISCUSSION

Introduction

A brief summary of the study is given in this chapter. The most significant results of the study are examined. Lastly suggestions for further practices are discussed.

Overview of the Study

This study focused on Emergency Remote Teaching period that took place in COVID-19 period in Turkey. 52 scholarly articles which are selected through Boolean search strings from Scopus, ERIC and DergiPark databases were the samples of this research, and a systematic literature review protocol is followed to find answers to the research questions. Demographic data of the articles are presented; categories involved methodology, data collection tools, sample size, sample type, grade level of the sample, curricular area and technological tools used during the ERT period. Categorization is recorded using Microsoft Excel spreadsheets. Articles are examined for changes in the teaching-learning cycle and results are given under this chapter.

Content analysis of this study's articles mainly consisted of the components of Huitt's framework which are moderately adjusted as changes related to context, changes related to input, changes related to classroom processes and changes related to measuring student learning. The analysis resulted in the following patterns; concepts of context; accessibility, flexibility of time and space, characteristics of home environments, internet and infrastructure problems, inequalities in possession of required technology; concepts of classroom processes; participation, use of

materials and communication between students and instructors; concepts of input; content, students' levels of interest and motivation, students' study habits and students' learning style.

Characteristics of the Research Articles

Emergency remote teaching period during COVID-19 started in March 2020, therefore in the search criteria articles are selected from March 2020 to May 2022. The study contained 52 articles which are selected as the study's sample after application of search criteria and examination according to abstracts. The highest number of articles are published in the year of 2021, followed by 2022. More articles are possibly to be contributed to the literature as the pandemic is not yet over (United Nations [UN], 2022). The most common research methodology stated in the articles is qualitative methods. The high number of qualitative articles can be explained by the nature of COVID-19 being an unprecedented phenomenon. "Qualitative research methods are valuable in providing rich descriptions of complex phenomena; tracking unique or unexpected events; illuminating the experience and interpretation of events (Sofaer, 1999)." Quantitative methods are the least used in the study's research articles. Quantitative methods contain collection of mathematical data and some forms of phenomena do not involve quantitative data but can be gathered quantitatively through certain data collection tools; for example, questionnaires asking for ratings (Sukamolson, 2007).

Data collection instruments consist mainly of interviews. Interview design involves asking open ended questions in a general way and the recording of answers (Creswell, 2012). The interview questions can be open-ended or in a semi-structured form. It is crucially significant to gather as much data as it is possible to synthesize a unique phenomenon, such as the COVID-19. With qualitative interviews, compared

to quantitative methods, it is possible to gather more data since open ended questions require genuine and authentic answers of the participants rather than one-word answers. The second preferred data collection instrument questionnaires and it is lastly followed by surveys.

Sample type of the study is chosen as instructors and learners, since learners and instructors are the core parties needed to achieve learning. Amongst the studies, learners are the most common sample type. Grade level of studies are categorized under K12 and University levels. Learners of higher education are the most preferred grade level amongst studies. This can possibly be linked to the fact that because of their age, higher education students are easier to reach and to work with. To work with K12 context students, certain permissions are needed to be taken from their parents, whereas higher education students do not need such permits and they can provide more complex and detailed data with research.

Sample sizes of the research articles differentiated between 1-3975. Small scale research are the most frequent ones in the articles. Subject areas covered in the research articles consisted of Classroom, Science, Mathematics, Turkish, English, Mixed and Unspecified categories. Digital tools referred in the research articles are also put under a list. Zoom video-communication tool is listed as the most frequent tool amongst the research articles. It is widely used as a synchronous video communication tool during the pandemic (Barbour et al., 2020) and around the world in 2020 as it is listed in one of the most downloaded application lists with around 500 million installations (Koetsier, 2021). In the research articles Zoom was followed by WhatsApp which was mainly used as sharing of information and materials.

Discussion of Significant Findings

Due to COVID-19 pandemic, education around world has been affected greatly (Can, 2020). To prevent spread of the virus, education institutions around the world ceased face to face education and shifted to distance education methods to maintain educational activities. Successful implementations of distance education require immense planning of curriculum and infrastructure, instructors also need to have a considerable amount of knowledge on appropriate technological tools. The virus' nature and its spread rate called for fast decision making therefore the planning period for distance education had to be skipped. The situation resulted in emergency remote education, which can be considered as a '*temporary solution'* (Bozkurt & Sharwa, 2020).

Having affected millions of learners worldwide, ERT period has led to many major educational results in Turkey as well. Emergency remote teaching period had started on March 23rd in Turkey and ended on July 19th. In this short term of interaction through online digital tools, lots of valuable lessons were experienced. The significant findings in the study are represented here to provide a summary to characteristics of ERT period in Turkey. During ERT period distance education was widely achieved with the help of information and communications technology (ICT) tools therefore advantages and disadvantages of ICT came into prominence (Akbana et al., 2021). The shift to online tools had to happen very fast to continue education, therefore teachers' and students' readiness concerning the use of digital tools could not be taken into consideration (Bozkurt et al., 2020). As a consequence, institutions, teachers, and students did not have the sufficient time to prepare and students also did not have a chance a to reconcile themselves to the new situation of shifting to their home environments as their main place for learning and studying. All of these

new conditions had certain effects on components of the teaching-learning cycle which resulted in changes to the variables within the cycle. The articles are synthesized according to their order in Huitt's framework for the teaching-learning framework under Figure 1 and subcategories are determined as changes related to context, changes related to input, changes related to classroom processes, changes related to measuring student learning.

Changes related to the context were related to the alterations that occur outside of the classroom environment. Moving classrooms to online environments happened because of a necessity resulting from the pandemic to suppress the spread of the virus. The changes which resulted from this sudden shift started as inequalities on possession of technological devices. The implementation and continuity of education during ERT period required possession of a device such as a computer which has the capability to perform activities such as connecting to the internet and enabling the use of video communication tools. Owning required technological tools were not financially possible for some learners whereas some learners had a computer or an equivalent device, but the performance of that device was not efficient. All of these circumstances led to inequalities between learners.

Another issue regarding context was infrastructure functions; learners had troubles concerning internet connection (Shim & Lee, 2020). Teachers experienced discomfort with internet connection as well. Since internet is a necessity for forming connection between institutions, instructors and learners, malfunction of its connection led to interruption of the learning. Other than interruption of the learning process and inequalities in owning technological tools (Sofianidis et al., 2021; Cahyadi & Widyastuti, 2022), concern about physical health was also found in the studies; long hours behind screens resulted in eye health problems. The place for

learning mattered greatly too, unsuitable learning environments in students' houses caused distractions during learning time (Petillion & McNeil, 2020).

Changes to input variable consisted of the attributes of teachers and students which they have developed prior to coming to the classroom. Regarding student characteristics, student motivation had shown decrease, which was mentioned nearly in every study. Learners' habits had differed after entering the ERT period; students failed to control their time and lacked the self-discipline to carry out study activities. Changes to student habits happened in a positive way; because of the nature of the online tools, learners had the chance to revise content any time they wanted to. Even though students showed lack of self-discipline, their self-efficacy skills had improved due to the nature of distance education systems where students need to plan and carry out studying and learning on their own to some extent.

Changes to classroom processes included students' and teachers' actions which they took during lesson time. In the planning phase, teachers experienced constraints due to their lack of digital skills and absence of appropriate content which were designed for distance education implementations. The use of unsuitable content reflected on students' behaviors too; the vast content designed for traditional systems increased students' workload immensely, as the boundaries of the content which should have been covered during lesson time was not defined well. Regarding teaching with online tools, teachers found themselves inexperienced (Ni Fhloinn & Fitzmaurice, 2021). Instruction phase wise, practice-based lessons were not implemented effectively because of the technological nature and inexperience with using distance education tools. Furthermore, teachers' inexperience in teaching with distance education systems resulted in teacher-centered activities, which decreased students' motivation levels and limited interaction between them. Throughout the

lessons, students experienced interaction problems (Wilcox & Vignal, 2020) and found communicating their teachers difficult and teachers underwent troubles giving feedback (Nugroho et al., 2021). Similar to the teachers' behaviors, students' behaviors shown differences too. Most of these differences happened as decreases; students were reluctant to participate, their interest levels were low, and they had problems concentrating and attending to the live lessons. The majority of these decreases happened because of the changes occurred in other variables, such as changes of their learning environment, the inexperience with distance education and teachers' way of delivery, planning and execution of the lessons.

Concerning measuring student learning, changes had occurred too. Teachers did not have enough knowledge on measuring students' learning through distance education methods. They were not able to follow whether their students were paying attention to the lesson or not. Since they were inexperienced with distance learning, they were unsure about the methods they used. Therefore, instructors experienced problems with evaluation, assessment, and homework control. For summative assessments, conducting exams resulted in several issues such as time management and exam security.

Implications For Practice

The research articles offered many implications derived from their synthesizes for improving emergency remote teaching. Literature on emergency remote teaching is limited and researchers' contributions are needed. The deficiency in the literature is understandable since it has been nearly three years after the declaration of emergency remote teaching period. Regarding the concepts determined through the changes in the components of the teaching-learning cycle, several suggestions were offered under this heading.

Technological devices are essential in connecting the learners and instructors. Constant interruption inflicting from malfunctions in the infrastructure of the technological equipment may result in learning loss, concentration problems and drawbacks between teacher student interaction. Therefore, institutions infrastructures need to be strengthened, and more technical support should be provided to the teachers and learners.

The inexperience regarding distance education systems and effective use of online tools resulted in constraints during ERT period. Teachers and students' perceptions regarding distance education was affected throughout this process. It is revealed that participants who could use technological tools well think positively of distance education methods compared to ones who don't (Güler et al., 2022). Therefore, teachers should be given periodical training sessions to strengthen their knowledge on distance education implementations on planning, measurement, and effective instruction. Measures regarding about exam security should be taken since students and teachers were concerned about exam security greatly during ERT period. Regulations regarding online lessons should be made and a set of fixed rules should be arranged.

Other than institutions and teachers, students' access to the necessary technological devices should be provided. Inequalities regarding possessing required technology was another issue resulting from the sudden shift to distance education. Therefore, for another possible emergency, new measurements are needed. A suggestion to this issue can be presented as increasing the number of facilities such as libraries with proper infrastructure and devices, where students who cannot afford a computer or a tablet can use should be considered.

Teachers of higher education manifested their observation on graduate working students finding the flexible nature of distance education beneficial. Therefore, increasing number of lessons offered by distance education should be considered. Live lessons can be used as a supportive measure for students. Teachers stated that there should be a program offered to support the face-to face education. “Live lectures, which can provide an equal opportunity in distance education with the developing technologies and Internet infrastructures, should now become an indispensable part of all distance education systems” (Durak & Çankaya, 2020b). It can be inferred that, even though teachers stated that they did not find distance education suitable as a primary method, they recognized its’ potential in enabling access for everyone.

Implications For Further Research

This review was conducted with a purpose to contribute to the literature of Emergency Remote Teaching during COVID-19 period which happened almost three years ago. To be better prepared for another possible situation and to learn from an extraordinary situation, continuation of research is needed.

The articles covered within this research are limited to a time frame of 2020 to May 2022 and to three databases. Therefore, researchers who wish to conduct similar research can use this research as their base and start their search string from May 2022. The codebook used for this study (Appendix B) consisted of eleven categories, for a future study adding different categories can be considered such as gender of the sample types of the research articles to present different patterns and aspects. A literature review software such as MAXQDA can be used to automatize and assist the researchers in reaching other possible noteworthy categories by locating word combinations which are popular in the overall articles.

Another implication for researchers would be to expand the number of the databases. Quantitative research was the least conducted method amongst the studies. Creswell (2009) states that quantitative surveys lead to "quantitative or numeric description of trends, attitudes, or opinions of a population" in research. Studies of quantitative research can be carried out to provide further statistical data. Regarding data collection instruments, test scores, observation, content analysis, reports and scales were used five times. To provide data which are collected from various instruments, more studies are needed. This study also brought forward a deficiency in studies concerning K12 students' study habits. More research is needed to understand changes to input component of the teaching-learning cycle concerning K12 context.

Emergency remote teaching period offered valuable lessons for all parties involved in education. The wide use of distance education during this period presented a high potential to connect students and learners to solve problems or to offer alternatives for time and place. Although there were many areas that needed to be improved, Emergency Remote Teaching solutions made education continue to some extent and allowed all parties to stay connected to each other.

Limitations

The review is limited to journals that are present into three databases: Scopus, ERIC and DergiPark. Journal articles that are selected for this study dated from March 2020 to February 2022 as the first step then the databases were checked again on May 2022 to add new articles. It is highly probable that there will be more publications added to the literature until the end of the year. However, because of lime limitations no further additions were made after May 2022. This eliminates the possibility of this article into being a living systematical literature review.

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Appendix A

List of Articles

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Appendix B

Sample Code Book

id	Title of the article	Author(s)	Year of the publication	Name of the Journal	Research Methods	Data Collection Tools	Size of the Sample	Level of the sample	Sample type	Digital platforms	Curricular area