

The Emergency Remote Teaching: A State University Experience

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Abstract

Due to the COVID-19 pandemic, emergency remote teaching in higher education institutions across Turkey in 2020 has become mandatory as of March. Emergency remote teaching practices added new applications for most of the instructors such as virtual classroom, online teaching, distance evaluation; those revealed different opinions based on experience on the positive and negative aspects and quality of the applications. This research was conducted to evaluate all these experiences held at a state university with a distance education center and a distance education database system but having only limited experiences on online courses before the emergency remote teaching in Turkey. The data set of the study was composed of the opinions of a group of instructors who participated in the distance teaching process for the first time and the official correspondence and reports made to organize, manage and evaluate the process during the first period of emergency remote teaching. The research is a qualitative case study where data obtained from different data sets are analyzed comparatively, inductively, and deductively. The results of the research show that within the scope of emergency remote teaching, the regulations regarding the application content in different faculties of the university should be differentiated, and this can be partially met during the emergency distance education process. In the context of effective and efficient use of the emergency remote teaching process, positive/negative situations have been experienced in terms of adapting to the database used in the teaching process, adapting existing teaching approaches, measuring and evaluating learning outcomes, and ensuring the participation of students in all these. Although instructors generally consider distance education as more student-centered practices and find the opportunities, it will provide positive in this context, but the effect of compulsory emergency remote teaching on learning outcomes was uncertain. Some suggestions are presented for the efficacy, effectiveness, and efficiency of the implementation.

Key Words: Emergency Remote Teaching, Adoption to Emergency Remote Teaching, Efficacy-Effectiveness-Efficiency of Emergency Remote Teaching

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INTRODUCTION

The COVID-19 epidemic, which has affected the whole world, forces people to rearrange all their vital relationships that they have built as civilizations until then. While trying to control the spread with "mask, social distance, hygiene", UNESCO called for the temporary closure of schools at all education levels in March 2020 to prevent the spread of COVID-19. Some countries responded to the call by continuing face-to-face education, some by partially closing their schools, some by suspending education, and some countries, including the Republic of Turkey by ending face-to-face education (UNESCO, 2020a). Thus, there are four types of practices in the context of education and training services worldwide (UNESCO, 2020b). The effects of this COVID-19 epidemic on education, in the context of its own dynamics, in the context of differing country education policies, require quantitative and qualitative research processes in terms of teachers and learners from elementary to higher education. The Presidency of Turkey announced on March 13, 2020, that schools at all education levels were closed, and face-to-face education was suspended. While the Ministry of National Education (MoNE), which manages compulsory education and non-formal education in the country, announced that it would switch to distance education within a week, the Council of Higher Education (CoHE), to which universities are affiliated, announced that education was suspended for three weeks as of March 16, 2020 (CoHE, 2020a). The transition process regarding the remote management of teaching activities by 189 higher education institutions in Turkey lasted until April 6, 2020: 121 (64%) of 189 universities were on March 23, 41 (21.6%) were on March 30, 25 (13.2%) have switched to distance education as of April 6, 2020 (CoHE, 2020b).

Epidemic and Education

COVID-19 is not the first time that the epidemic and education have been discussed together. SARS in 2002, H1N1 Flu in 2009 affected many people around the world and caused a break in face-to-face education in countries such as China, Bulgaria, France, the United Kingdom, and the USA in the relevant years (Cauchemez et al., 2014). For extraordinary situations such as epidemics, natural disasters, and wars that require a break-in face-to-face education, UNESCO in 2015, in the Education Action Plan Incheon Declaration created for 2030 education, provided all countries in the world with "alternative learning and education forms" that they can use in crisis and emergencies, during periods of not going to school. It was also stated that they should "keep the equivalent and bridge programs and practices ready" that would enable them to continue their education (UNESCO, 2015, Target 4.1., Article 34, p. 38). Today, it is unclear to what extent the countries of the world are able to take this message into consideration for all education levels. However, it is known that the epidemic process affects students in the compulsory education period more negatively in developing countries than those in developed countries (UNESCO, 2020c). In fact, UNESCO estimates that after the COVID-19 epidemic, a total of 23.8 million children and young people from preschool to higher education are at risk of not returning to school (UNESCO, 2020d).

The COVID-19 pandemic has negatively affected every level of education. Regarding the negative effects of the epidemic for the higher education system, the International Association of Universities (IAU) affiliated with UNESCO has prepared a research report. According to the IAU report, which was completed in the light of the data collected on 25 March-17 April 2020, more than half of the respondents from five different continents, 109 countries, and 424 universities stated that "all campus activities at universities stopped" in the relevant period. Although almost all universities have an infrastructure in which they communicate with their students and staff, they reported that they had "difficulties in effective communication flow in the COVID-19 epidemic". According to expectations, the COVID-19 epidemic will negatively affect the enrollment numbers in the new academic year, causing a "financial problem" at the higher education level in the coming years, especially in private universities. In terms of education, "COVID-19 affects teaching and learning"; it has been reported that there are difficulties in the transition from face-to-face education to distance education. These difficulties mainly stemmed from "access to technical infrastructure, necessary qualifications for distance education and pedagogy" (Marinoni et al., 2020, p.11). These results can be interpreted as the higher education system has/will experience some inadequacies in terms of having

equivalent applications that will replace face-to-face education in order not to be interrupted in extraordinary situations and putting them into action in crisis situations.

Distance Education

Distance education, which UNESCO recommends being implemented at various teaching levels in many countries around the world, was actually included in education systems many years ago to replace or strengthen face-to-face education around the world. In its simplest definition, "distance education" or "distance learning" is "the education of students who are not physically present at school" (Kaya, 2002). During the 300 years it has been in practice, both its content, presentation, and the technology used have changed and diversified (Adıyaman, 2002; Battenberg, 1971 & Delling, 1966 cited in Holmberg, 2005, pp. 13-14). In Turkey, it has gained legal ground with Articles 5 and 12 of the Higher Education Law No. 2547; with the Distance Education Regulation prepared in 2001, many universities in Turkey have provided distance education operating systems (Ozbay, 2015).

Currently, distance education has hybrid or blended applications that are offered entirely remotely or combined with face-to-face applications. Distributed learning, e-learning, m-learning, online learning, virtual classroom, etc., today constitutes the current terminology of distance education. Incorporating all these changes, distance education is defined as "a multimedia-based, interactive, planned and programmed application" (Barker et al., 1989). While distance education provides the learner with initiative, responsibility, and flexibility with interactive learning applications, it requires the teacher to create an effective learning ecology. The teacher must carefully plan and design the educational process, and the learning objectives must be clearly identified. The platform, which is also used for learning and teaching, should be flexible and accessible (Hodges et al., 2020). At this point, Bozkurt and Sharma (2020) report that "due to the COVID-19 epidemic, what is in practice differs from distance education". This one is urgent and compulsory, so "it should not be equated with distance education". What is in practice today is "shifting face to face courses to alternate or online delivery modes, to provide instruction during a crisis situation until it has abated." (Bawa, 2021). It is known that the practice called Emergency Remote Teaching (ERT), which emphasizes that it should be considered separately from distance education, produces different results in teaching and learning (see: Bao, 2020; Bawa, 2021; Drane et al., 2020; Mishra et al., 2020; Sumardi and Nugrahani, 2021). The aim of this research is to describe the substitute of face-to-face education and its place in distance education of ERT, which was put into mandatory practice due to the COVID-19 epidemic. In this context, the transition to ERT, the experiences during the process, and the first period of ERT are analyzed within the scope of the practices of a state university in Turkey. The research sought answers to the following questions:

1. Regarding the *efficacy* use of ERT:

- a. How was the database system to be used during ERT introduced to the users, and to what extent did the users feel competent in using the system?
- b. How are users placed in ERT database system?

2. Regarding the *effective* use of ERT:

- a. Did ERT requires changes in teaching strategies? Which of the teaching resources (discussion forms, chat rooms,...) offered in the database system could be used more?
- b. How did the student achievements in ERT be evaluated? Are the gains obtained in ERT equivalent to the targeted gains for the course?
- c. During ERT, were the competencies that were not possessed until then acquired? If acquired, what are these competencies?

d. What are the views on the continuation of using ERT? Are there aspects of the application that need to be developed, and if so, what are they?

3. Is ERT application efficient?

Based on the results of the analysis, a list of suggestions has been created regarding the *efficacy, effectiveness, and efficiency* of the process, in particular higher education institutions, in case of emergency transition to distance education for similar or other reasons.

METHOD

The research covered the spring semester of the 2019-2020 academic year, when ERT was implemented for the first time. The data set of the research consisted of face-to-face interviews with a group of lecturers who participated in ERT in the relevant period, official correspondence at the university to organize the process, and reports evaluating the relevant period. In this context, the research is a case study in which the findings obtained from two different data sets (interview transcripts and official documents) are analyzed as deductively, inductively, and comparatively by researchers (Creswell, 2007; Guler et al., 2013). "The case study is one of the dominant research approaches used in qualitative research." (Seggie & Yildirmis, 2015, p. 27). The approach "provides a deep understanding of phenomena, events, people or institutions" (Jensen & Rodgers, 2001, p. 237), "requires multiple methods and data sources for analysis" (Berg & Lune, 2015, pp. 354-355), in its application "focused questions, observations, audio-visual recordings, written sources or documents" can be used as a data source and that enables "to create and interpret patterns with in-depth descriptions, logical inferences on the thematic basis" (Paker, 2015, p. 119). The case study is preferred in cases where "why and how" questions about a social phenomenon are investigated "to examine current but manipulated or uncontrollable phenomena." (Yin, 2003 cited in Turkoglu, 2015, p. 43). In this study, ERT is analyzed in line with the practices of the state university in Turkey as a *manipulated and uncontrollable phenomenon*.

Setting: Status of the University at the Time of Transition to ERT and Research Permit

The data in the research were collected with the official permission of the state university in Turkey, dated 22.05.2020 and numbered 55447807-044-E.23090. There are three institutes, 13 faculties, six colleges, and 13 vocational colleges affiliated with the relevant university. In the Spring Semester of the 2019-2020 Academic Year, the university included a total of 26,687 students; 11,249 at the pre-graduate, 13,966 at the undergraduate, and 1472 at the graduate level (master = 1317, doctorate = 155). 1039 of the students are foreign nationals. There are 868+ instructors (85 professors, 93 associate professors, 348 assistant professors, 342 lecturers, and research assistants who have Ph.D.) participating in ERT at the university.

"Distance Education Application and Research Center (DEC) was established in 2013" (SRQ, p.2). A distance education database system was purchased for the center in 2016. Since 2016, some courses (foreign language, Turkish Language, History of the Revolution of the Republic of Turkey, and postgraduate courses in distance campuses of the university) at the university have been offered by distance teaching in different years. DEC defines its mission as "ensuring the continuation of education and training activities with distance education technologies, providing equal opportunities,.. increasing the efficiency of education and training programs with developing technology" (SRQ, p.2).

On March 16, 2020, after four weeks of face-to-face education, activities at the university were suspended, and the Distance Education Commission was established. At the second meeting of the Distance Education Commission on March 20, 2020, it was decided to switch to distance education in theoretical courses in all units of the university, except for sixth-year students of the medical faculty. The relevant academic unit has been authorized on how to present internships and practical courses. During this period, 100 virtual classrooms were rented, and virtual classrooms provided via Adobe Connect were made available through the database system called E-Courses

managed by DEC. According to the course load, the virtual classrooms were divided among the academic units affiliated with the university, and a program was prepared for each academic unit to use the virtual classrooms, and it was shared with the public on the official internet address. As a result of all these preparations, ERT has been started as of April 6, 2020.

Data Collection Tools and Working Group

Two data sets were used in the study. The first data set of the research was composed of official documents sent to academic units in order to organize and manage ERT at a state university in Turkey. In this context,

1. *Correspondence* within the unit: It is the correspondence made within the academy unit (faculty). Since it is not possible to reach the relevant correspondence based on each unit, the correspondence of the education faculty of the university was analyzed. Correspondences with the content of ERT sent from 16 March 2020 to 12 September 2020 are included. These correspondences are coded as *CRI-14*.

2. *Senate decisions* taken in line with the opinions of the distance education commission: Five senate decisions were taken in the relevant period to manage the process. It is coded as *SDI-5*.

3. Reports prepared by the university's Distance Education Center (DEC): In this context, there are two separate reports that include lecturers (instructor+lecturer) and students. The instructor report was coded as *LR*, and the student report as *SR*.

3. *Supplementary Report on Quality Assurance in Distance Education*, prepared under the coordination of the University's Accreditation, Academic Evaluation and Quality Coordinatorship and DEC in line with the Quality Assurance Criteria and Evaluation Guide in Distance Education 2020 (CoHE, 2020b) of the Higher Education Quality Board and shared with the public via the university's official website: This report in the following sections of the text were coded as *SRQ*.

4. *The University's 2020 Strategic Plan Monitoring Report*: The report prepared by the Strategy Development Department with the data of 2020 is coded as *MR*.

As second data set, interviews were conducted to evaluate the experiences of the instructors who participated in the first term of ERT. A semi-structured interview format was adopted for the interview, which is frequently used to collect data in qualitative research (Fraenkel & Wallen, 2006); an interview draft form was created by the researchers. For the draft published research texts (for example, Erfidan, 2019; Kaya et al., 2017) reviewed. The form, which was prepared in line with the opinions of two experts, was made ready for application. In the document, there are 13 questions asked under the sections of "personal view, application, evaluation and general evaluation of the whole system". Questions "Evaluation section Question 10: Do you think your students were able to acquire the gains they needed to gain from the course thanks to the distance education system? If yes, how did the system contribute? If no, why do you think they did not achieve the gains you were aiming for?" format. In the interview form, there are also questions for demographic information such as "academic unit, whether or not they have participated in distance education before,...".

Appropriate sampling (Maxwell, 1996; Patton, 2002) was preferred in determining the instructors. Interviews were held with 11 instructors working in different faculties who participated in ERT, volunteered to answer the questions in the interview form, preferably did not participate in previous distance education applications of the relevant university. Three of the participants are professors (Pr.), four are associate professors (Assoc.), and four are assistant professors (Assist.) (Table 1). They have been participating in teaching activities in higher education institutions for at least three and at most 15 years as instructors. The technology use level of most of the participants is "moderate" (n=8). The lectures offered by more than half (n=6) are practical (laboratory, practice, clinical). Six of them have administrative duties in the relevant period (such as institute director,

chancellor or vice-dean, department chair). Most of them offered (n=6) applied course content (like laboratory, practice). Six of them have administrative duties in the relevant period (such as head of the institute, the vice-chancellor/dean, the head of the department).

Table 1. Participant Group

Code* (n=11)	Title	Academic unit (Faculty of..)	Seniority (as instructor)	Course type	Technology use level	Administrative duties
E1	Assoc.	Education	12	Theoretical+Laboratory	Moderate	Yes
E2	Pr.	Education	13	Theoretical	Moderate	Yes
E3	Pr.	Education	9	Theoretical+Staj	Advanced	Yes
E4	Assoc.	Education	8	Theoretical+Staj	Moderate	Yes
S5	Assist.	Science	3	Theoretical+Laboratory	Advanced	No
F6	Assist.	Fine Arts	10	Theoretical+Practice	Moderate	Yes
C7	Pr.	Communication	15	Theoretical	Moderate	No
En8	Assist.	Engineering	5	Theoretical	Moderate	No
M9	Assoc.	Medicine	7	Theo.+Clinical Practice	Moderate	Yes
M10	Assoc.	Medicine	8	Theoretical	Moderate	No
VC11	Assist.	Voc. College	7	Theoretical	Advanced	Yes

* Participants are coded with their academic unit. E: Education, F: Fine Arts, S: Science, C: Communication, M: Engineering, T: Medicine faculties, VC: Vocational College.

Only one of the instructors in the study participated in an application that can be evaluated within the scope of distance education as a student (E4). Thus, ERT is the first experience of the instructors. Except for E1, S5, C7, and VC11, others attended the video conference on virtual classroom practices organized by DEC officials during the preparation period for the transition to ERT.

Creating the Data Set

The official correspondence used within the scope of the research was obtained as an electronic file from the university's editorial office and the data processing unit of the education faculty. The reports were obtained from the official website of the university. For the data obtained through face-to-face interviews, within the scope of the research, 11 instructors who allowed voice recording were interviewed in their own offices (E1, E2, E3, E4, F6, C7) or in places they deem appropriate (S5, En8, M9, M10). Four of the participants (S5, F6, En8, VC11) requested that the interview questions be shared with them before the interview. All participants were informed about the purpose of the research, how the interview would take place, the importance of taking a voice recording, and they were assured about the security of their personal information. The shortest interview lasted 28 minutes and the longest 52 minutes. The interview contents were transcribed as Word documents by the researchers and shared with the participants before the analysis for their checking.

Analysis of Data

In the research, the data obtained from official documents were analyzed with qualitative and quantitative content analysis, and the interview texts were analyzed with phenomenological coding. Content analysis involves “generating logical patterns and meaningful categories from raw data; thus, it is an “analytical” tool that enables the data to be examined in a holistic manner (Julien, 2008, p.120; Guclu, 2019, p. 167). Content analysis was applied in this study with both qualitative and quantitative content. Qualitative content analysis for the “theme, meaning and emphasis” of the messages (contents) conveyed through official documents (Guclu, 2019, p. 177); quantitative content analysis was used in the analysis of the numerical values in the data sets used. Subjective data obtained from qualitative content analysis were tried to be supported by objective (repeatable and verifiable) data obtained from quantitative content analysis. Interview texts, on the other hand, are phenomenologically coded to reach the common essence, as they include the experiences of the instructors (Fraenkel & Wallen, 2006) during the ERT. Phenomenological coding, “cascading and phenomenological reduction; describing units of meaning; clustering semantic units to form themes;

summarizing, verifying and modifying each interview; It is the analysis that takes place in the stages of “preparing a combined summary by extracting general and original themes from the whole interview” (Hycner, 1999, pp. 148-152). Thus, the data in the study were analyzed in four rounds. In the first round, similar contents in different data sets were brought together and ordered chronologically. In the second round, the documents were coded with qualitative content analysis, and the interview texts were coded with phenomenological coding. Thus, the researchers identified the prominent, repeated, emphasized themes and categories in the data sets used in the research with the codes they created in the first two rounds. In the third round, the axes were formed by associating the codes with the research questions. The data sets used while creating the axes are presented in Table 2.

Table 2. Data Sets Used for the Questions

Axes	Question	Correspondence: <i>CR</i>	Senate Decisions: <i>SD</i>	Reports: <i>LR, SR, SRQ, MR</i>	Interview texts	
<i>Efficacy</i>	1.	a.			x	
		b.	x	x	x	
<i>Effectiveness</i>	2.	a.		x	x	
		b.	x	x	x	
		c.				x
		d.			x	x
<i>Efficiency</i>	3.	x		x	x	

Finally, the entire data set was reviewed in the last round with *the axes determined by the researchers as the efficacy, effectiveness, efficiency* of ERT. The data analysis process applied within the scope of the research is summarized in Figure 1.

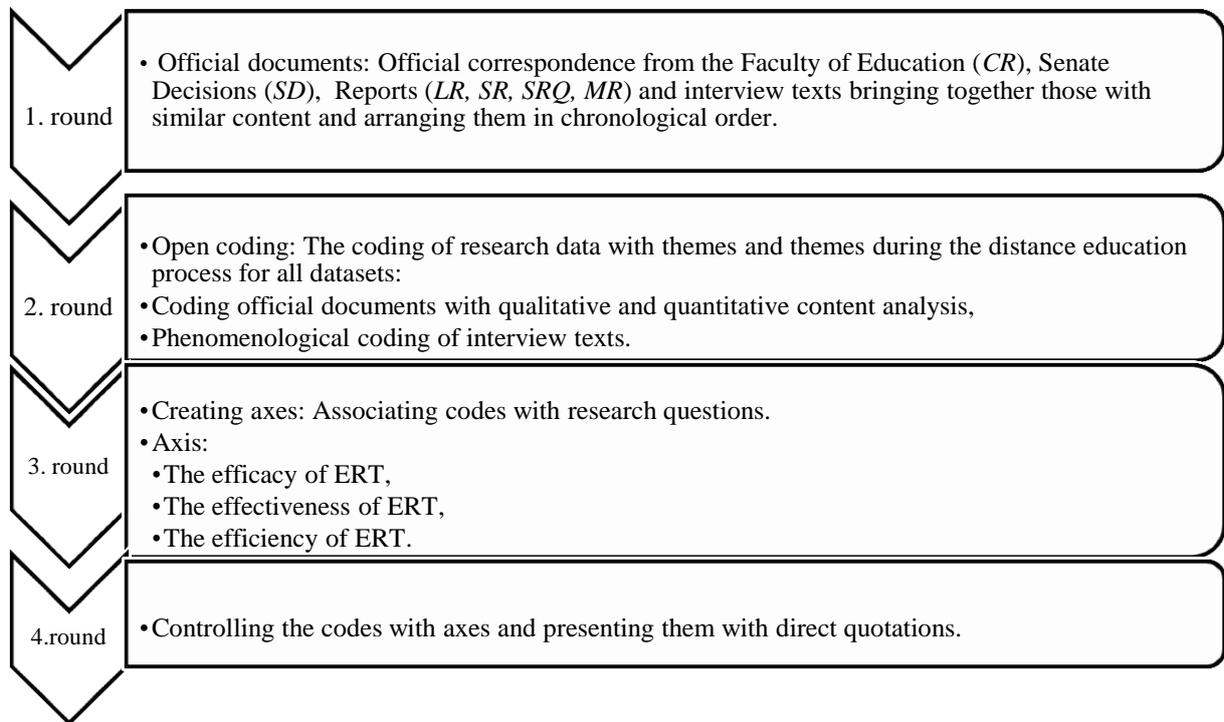


Figure 1. Data Analysis Process

Thus, the data obtained during the analysis were analyzed together in comparative, inductive, and deductive processes. In the findings, the axes and themes obtained are presented with direct quotations from the datasets used.

Validity and Reliability Studies

The credibility, portability, reliability, and verifiability used in qualitative research literature correspond to the concepts of internal validity, external validity, reliability, and objectivity in quantitative research (Marriam & Tisdell, 2016). In this context, the researchers informed the participants in detail about the research process before the interview and clearly stated that they had the opportunity to leave the research whenever they wanted, allowing only voluntary participants to participate in the research (Shenton, 2004). For reliability, triangulation was used in the research, and as a debriefing and member checking process, each researcher submitted the codebooks they made to the control of the other researcher (Creswell, 2012). In order to ensure credibility, the data obtained from the interviews were confirmed by the participants (Creswell, 2014; Marriam & Tisdell, 2016). An external audit of the research was carried out by another state university faculty member with a doctoral degree in program development and assessment and evaluation to supervise the findings (Christensen et al., 2014; Creswell, 2007; 2014). The direct quote strategy was used to ensure credibility (Christensen et al., 2014).

The Role of Researchers

In qualitative research, the researcher is not passive. While the participant tries to understand their experience, the researcher and the participant produce the data together. For this reason, the researcher should "clearly express his personal history" while "forming his interpretations based on research findings" (Creswell, 2014, pp. 187-188). One of the researchers is a computer and instructional technology specialist who has been a lecturer for 17 years and also works in the DEC unit. The other is an educational administration specialist and has been working as a faculty member for more than eight years and has completed studies in the field with qualitative research methods. Both researchers participated in the ERT activity during the period when their data were collected and offered theoretical, practical, and internship courses.

In qualitative research, the researcher is expected to be aware of his feelings and thoughts about his own experiences and to bracket his prejudices (epoché) (Creswell, 2012). Recognizing that their own experiences may create bias, the researchers discussed their prejudices before the study started and included direct quotations from interview texts and official documents in the transfer of findings to ensure objectivity.

FINDINGS

In this section, the sub-themes obtained according to the three axes determined in the fourth-round analysis of the research data: *efficacy*, *effectiveness*, *efficiency*, and direct quotations related to these themes are presented with the axis titles.

Findings Regarding the *Efficacy* of ERT

The efficacy is related to the correct implementation of the ERT in order to achieve the desired or intended results. Under the efficacy axis, the data were associated with the use of the ERT database system, technology requirements, and planning of teaching time.

Use of ERT database system

The use of the database system was introduced to users through online meetings and informative videos prepared by DEC. The questions submitted via the Complaint-Comment-Suggestion Form created on the DEC official site were resolved by DEC (*SRQ*, p. 12).

In terms of database use, the instructors felt competent over time:

M9: *“We were given an introductory lesson in the form of ERT. Of course, I couldn't understand all of them... I went to him.. he told me again. At that time, I took a video. I can say that I reinforced it while using it.”*

C7: *“I will relate the process to my learning to swim. My father threw me into the sea to learn by myself. This is how I learned ERT.”*

There remains a need to learn about database usage: According to the results of the Teaching Staff Distance Education Survey completed by DEC with 351 lecturers, almost all of the participants (98%) visited the official website of DEC. About one-third (27%) of respondents requested information (or reported problems) from DEC via e-mail; nearly half (41%) stated that they needed in-service training to be able to use the ERT platform (LR, pp. 2, 6).

According to the results of the Distance Education Process Evaluation Form, which was answered by 6454 students (24% of the total number of students) applied for ERT evaluations, almost all students (98%) who answered the questionnaire applied to the official web pages, watched videos of DEC to learn how to use the system. It was determined that more than half (65.4%) of the students who responded to Form were "satisfied" with the informative resources provided. About one-fifth (19%) of the students emailed DEC for information or reported a problem. More than half were satisfied with the adequacy of the answers (66.7%) and the response speed (64.3%) (SR, pp. 4, 5).

Technology requirements of the ERT database system

The E-Course system used necessitates having an uninterrupted internet connection, a computer, or a mobile phone with a personal data assistant (PDA) system.

The technological infrastructure of the users is insufficient:

M10: *“We repeated our lessons in the form of questions and answers.. they had connection problems...”*

VC11: *“Those who do not have a computer in their village, cannot attend any classes because they cannot access the internet..”*

E1: *“My wife is a teacher. I also have a son. Everyone is schooled. During class, everyone is in one room. The internet is slow.”*

E3: *“I had problems because I don't have internet at home.”*

In the results of the survey, there are findings showing that the students do not have the necessary technological infrastructure: "lack of sufficient internet access, not having a computer" (SR, p. 18) negatively affected the ERT process.

Planning of teaching time in ERT

In the university, the transition to emergency distance education was completed in three weeks (SDI): the adequacy of the database system was checked, 100 virtual classrooms were rented (SRQ, p. 8; MR, p.18). Virtual classrooms are divided into academic units (44 for faculties, 9 for colleges, 30 for vocational schools, 17 virtual classrooms for units affiliated to institutes and chancellorate) according to the course density and number of students (MR, s. 18).

The time allocated for teaching in face-to-face education is not equal to the time planned for ERT:

VC11: *“..the biggest disadvantage is that a virtual classroom cannot be given to every classroom and therefore the weekly curriculum is very tight and fragmented.”*

C7: *“Time was running out in the virtual classroom until we said we started, we were connected.”*

E4: *“It was said that it was enough to do virtual lessons for four weeks, but until the end of the semester, I did all my lessons on time. I started at the beginning of the hour and closed it at the 59th minute. If you say that the two-hour weekly lesson could be done in 59 minutes, it is a bit suspicious.”*

M10: *“It was not possible to run the course programs in our faculty. We have boards. We are seven or eight lecturers in each board. The virtual classroom was assigned to one person from that board. I recorded all my lessons asynchronously at night.”*

M9: *“We looked at the patient simultaneously. It was not possible to conduct the lessons according to the schedule.”*

Findings on the Efficiency of ERT

The success of ERT in producing *the desired results and its effect on students' learning outcomes* were evaluated under *the axis of effectiveness*. In this context, *the axis of effectiveness* has been associated with sub-themes: *arranging the teaching content, applying the teaching content, evaluating the learning outcomes, and sustainability of ERT*.

Arranging the teaching content in ERT

The arrangement of the teaching content in ERT is left to the initiative of the instructors (SD1).

Contents prepared for face-to-face education were also used in ERT:

M10: *“..I have presentations. .. there is not in.. I have written the important points.”*

E4: *“I normally use a powerpoint presentation in class. Since I uploaded those presentations to the system as a resource during this process, I filled out the content of each slide... I thought maybe they would read the slides.”*

E2: *“I gave a summary of a lesson we did in face-to-face education.”*

M9: *“Our Dean's Office asked DEC to make a presentation about how their content should be prepared for the E-Course. They did. However, our instructors asked questions about the use of the database system in general. Most of them did not attend.”*

ERT required a review of course outcomes:

E2: *“Do the same outcomes have to be given at the same rate in ERT? In other words, it is meaningless to dry today's laundry in the sun of yesterday.”*

E1: *“We had to apply the summary of the lesson there.. without going into details.. in a way that makes the student think more and directs them to search.”*

Implementing the teaching content in ERT

Lessons in virtual classrooms are placed in the program with the name of the responsible lecturer (MR, p. 18; CR6-8), from 9.00 in the morning to 11.00 at night, including weekends, and the program is shared on the official websites of the academic units. According to the new academic calendar prepared for ten weeks, it was requested that the lessons be held for a minimum of 10 minutes and a maximum of 50 minutes and that at least 40% of them should be held and recorded in the virtual classroom. “The camera/webcam is on during the lesson” is compulsory for the instructors.

On the other hand, students were informed that "since there may be conflicts in the program, they can watch their lessons asynchronously and this will not be a problem". "A minimum of one source every week – word document, pdf, .."; lecturers were asked to "at least three weeks of forum/question-answer, homework/practice (individual/group) and at least one hour of student-lecturer communication per week (via the system - using messaging or chat feature)" (SD1, CR6).

In the ERT process, the instructors used the teaching methods they used in face-to-face education and tried to maintain the sameness: Database system used offers: discussion forums, chat rooms, synchronous/asynchronous videos, essential concept videos of course content, presentations, follow-up exams, assignments, feedback via private message system, live online activity with students, seminar-workshop, external links/adding resources. The total number of courses conducted in 100 virtual classrooms in the relevant period is 5628. It has been determined that the course materials uploaded to the E-Course system mainly consist of virtual course records, written sources (pdf, PowerPoint) (SRQ, p. 8). Lecturers reported that they primarily included "virtual classrooms, written resources, homework and presentations they prepared" in their teaching processes (LR, p. 8). Students stated that "written resources, virtual lessons, assignments" were beneficial in their learning (SR, p. 6).

E1: "Normally, I teach the lesson. In remote I also."

S5: "Normally, I teach the lesson by drawing on the board. Here I wrote on the slides that I showed on the board."

The physical space and teaching materials offered in the virtual classroom are not compatible with the regular classroom used in face-to-face education. Incompatibility has made the teaching of numerical science courses more difficult:

S5: "Normally, I teach the lesson by writing and drawing on the board... I could never use that white page opened in the system."

M10: "While I was explaining on the figure, there was one arrow here. The arrow was huge. It was covering up what I wanted to show."

F6: "We do graphic design. It is possible to draw and show what is possible on that white page that opens."

En8: "There are applied courses in engineering education. It takes place in a laboratory environment. It is not possible to give in a virtual classroom."

It has not been possible in ERT to offer practical (laboratory) courses properly: In the first academic planning for the applied courses offered in various programs within the scope of the university (especially Fine Arts, Education, Medicine, Communication, Health Sciences Faculties, Conservatory and Foreign Languages and Vocational Schools), with the thought that the epidemic will disappear, they will be held on 15 June -17 July 2020 with intensive face-to-face summer programs (SD1-2, CR7). When it was realized that this application could not be made, the courses considered in this context were reintroduced to the ERT program as of May 2020 (SD3).

F6: "In the first place, we planned to organize an intensified face-to-face program in the summer; frankly, we postponed it."

M9: "The application must be at the bedside. Your instructor shows something, says something at that moment. I still remember that information."

E1: "The student will take the slide, the coverslip, take a section from the sample; cut off hand if necessary. This is not possible here."

S5: "Ankara University, METU... made the contents of some of its courses accessible. I uploaded videos of experiments made in the laboratory at METU every week for my applied course. I uploaded pdf documents explaining how those experiments were done."

Doing practical training in ERT could not be realized: Completion of the theoretical parts of the practical training through ERT (SD1), and within the practice part, following the decision of the relevant boards of the academic unit was deemed appropriate (SD2). To the academic units: "Assess what has been done so far, taking into account that the students have received practical training in businesses for 5-6 weeks; completing the rest in the form of lectures, assignments, projects, application files in distance education; preparing homework, project and application files for the internship content; simulation training, projects, case studies, etc., through ERT, for students who are at the graduation stage in nurse and midwifery programs.." (SD2-3; SRQ, p. 8). Thus, it is possible to make different applications for practical training in academic units (SD2-4, CR9). In this context:

Not grading the practical training application, making an oral exam:

M9: "We have decided that the final report cards of our 4th and 5th term students will not be evaluated provided only this year, the final exams will be made verbally and recorded via the ERT platform, with live connection and audio and video."

Considering the 5-6-week practical trainings that have been done until that day, the remaining part be completed with distance courses, homework, projects, application files, etc.:

E4: "They had gone to teaching practice for four weeks. The MoNE said enough internships. My students prepared an event."

Evaluation of learning outcomes in ERT

The decision regarding the examinations of the 2019-2020 academic year "to be determined by the academic units, on the condition that they are transparent, auditable, measurable and documentable, by using alternative methods such as homework, projects, questions, and answers" has been announced to all academic units (SD3-4, CR10).

Course outcomes in ERT were mostly evaluated with assignments:

S5: "I gave assignments. I gave it a few days. It was like a research paper."

E4: "I even gave more than one assignment."

Reliability could not be ensured in the evaluation of student outcomes in the ERT process:

S5: "I prepared the exam for the final. I uploaded it in the morning. I gave it about 12 hours. ..multiple choice, fill in the blanks.. It is very easy to access information on the internet, they can reach the information immediately when they write."

M10: "The exam has been canceled and requested again. I prepared 150 questions. ..the questions are already in the hands of the students. By communicating with each other in an interactive way. We will have a very serious problem as the questions are in the hands of the students."

M9: "We could not control the students during the exam."

E4: "I gave assignments. Enough to read someone's. They learned how to copy and paste."

VC11: "I think the measurement and evaluation could not be done completely."

Evaluation could not be completed within the stipulated time: Exam schedules had to be constantly updated throughout the university (SD3-4), and in this context, the announcement of final grades was delayed (CR14).

It is unclear to what extent the targeted outcomes are realized in ERT:

M10: “*The grades do not reflect their level of knowledge.. They form a group and communicate during exams.*”

E1: “*In this system, you cannot say to the student: pick mushrooms, collect lichens.. They cannot go out anyway. We evaluated them with what they could find on the computer or on the internet. The outcomes we wanted did not happen.*”

Sustainability of ERT

There are positive/negative aspects of distance education partially experienced within the scope of ERT.

ERT is an application made out of desperation:

C7: “*It was a crisis process. Was there any other solution?*”

E2: “*ERT decision was changing my order. I didn't like it. We had to.*”

ERT has protected from contagion in the epidemic:

F6: “*We were in contact in the same studio.. masks wouldn't protect us. This needed.*”

En8: “*Health comes first. It was a very good decision.*”

ERT has enabled technology-assisted teaching applications to experience:

M10: “*Yes, ERT allowed us to be more intertwined with technology.*”

ERT required unlimited access to learning resources:

E1: “*A presentation file, a slide, a synchronous, asynchronous course, the internet... they do not constitute the main learning resource. The main source is the book. Was there open access to our library?*”

Distance education is an opportunity for student-centered teaching:

M9: “*We have been looking for ways to provide student-centered teaching in medical faculties for a long time. .. we recently found the department of medical education. In this we saw that there is such a field, that there is an alternative that can be shaped in line with the needs of the student.*”

F6: “*I exemplified virtual exhibitions, how they can visit, how they can exhibit their own works there... the student can create own space, learning space in this system.*”

Distance education eliminates space and time constraints:

E2: “*My group was very satisfied. I have a working graduate group. They wished that it would always be treated like this in the future.*”

Findings on the *Efficiency of ERT*

Within the scope of *efficiency*, the *functional use of resources* used for ERT (amount of learning resources, their adequacy, access to resources, use of correction mechanisms,..) and *participation* were associated with sub-themes.

Functional use of resources

While the number of courses offered by the university with distance education was only four until that time, this number reached 5628 in the first period of ERT (*MR*, p. 22).

It is unclear whether enough resources are shared for teaching: The number of course materials uploaded to the E-Course system in the relevant period is 59,444. This shows that approximately 11 materials per lesson are shared through the system (*SRQ*, p. 8; *MR*, p.22). Considering that the remaining 10-week teaching plan of the university was completed remotely as of April 6, 2020; this number, which shows all materials uploaded to the system, especially virtual course records, written resources (word, pdf, PowerPoint), URL (external resources), can be considered to be quite insufficient.

It is unclear to what extent students have access to shared resources:

VC11: “*The fact that the E-Course system is more suitable for desktop use caused our students to have problems watching the course videos afterward.*”

En8: “*The biggest disadvantage for the student; It was a necessity to have a fast internet network, computers where they were.*”

E3: “*Most of them could not access the resources I uploaded; for example, they could not download the course recordings. There is no need to save it somewhere and watch it later. .. most of their lines had a quota.*”

It was not possible to process user feedback into the system: Feedback on educational processes (course, lecturer of the course, education environment, diploma program, service, and general satisfaction level, etc.) at the relevant university is received at the end of each semester or year. This application was also carried out in ERT, and the notifications received but they were not used in decision-making processes for improvement (*SRQ*, p. 13).

Participation

In the spring semester of the 2019-2020 academic year, 26,687 students and 868+ lecturers used the E-Course system.

Only some of the students were able to participate in learning activities simultaneously:

E3: “*The students did not come, did not attend. We had lessons with two or three..*”

S5: “*I opened a chat session for one hour each week... There was not much participation.*”

E4: “*Most of the students did not come to the life lessons. I did some lessons myself.*”

It is unclear how much lecturers participate in teaching activities: In ERT, the time allocated for face-to-face education could not be matched with the time in the E-Course system. This situation required the additional course fees paid to the lecturers to be discussed and decided separately by the university senate (*SD5*).

CONCLUSION, DISCUSSION SUGGESTIONS

It can be considered highly significant that *education* is among the human activities that cannot be postponed during the epidemic period in Turkey, besides health and production. In this study, the first period of ERT, which was put into practice out of “desperation” according to the participants of this research, in order to eliminate the effects of the negative impact of the epidemic on higher education, was analyzed in line with the experiences of the state university in Turkey. Before the epidemic period, an infrastructure for distance education was established in the relevant university, and this structure was experienced in the presentation of some courses in a limited amount; this first ERT experience of the university shows that there are issues to be considered in the future applications.

It has been determined that there are some problems related to the *efficacy* of ERT, including the introduction of the database system, having the necessary technology for the system, and equalizing the teaching time with that in face-to-face education. Although the establishment of a systematic and accessible infrastructure in order to manage the ERT process in the relevant university is rapidly provided the limited distance teaching and learning experiences of the users made it challenging to adapt to the system. In the literature, “creating and sharing quality content in an appropriate language, having hardware and internet access for exchange” is defined as “digital equality” (Willems et al., 2019). It is understood that there are some problems with digital equality in the university evaluated within the scope of this research. Digital (in)equality negatively affected distance education, especially in developing countries (Khlaif et al., 2021). It has been determined that the lack of continuous internet connection is the biggest obstacle to the transfer of the current pedagogical strategy to ERT (Sumardi & Nugrahandi, 2020).

In the study, the effect of ERT on learning outcomes was evaluated as effective; it was understood that the teaching staff continued to use the teaching methods they used in face-to-face education in ERT, and they shared the teaching resources they prepared for face-to-face education over the database system. In the presentation of the practical and laboratory courses, the previously recorded course practices were shared with the students; internship contents could not be adequately realized. At this point, Gares and colleagues (2020) found that the active learning components (interactive seminar, small-group problem-solving sessions, think-work together-share), especially in practice and laboratory courses in ERT increase both participation and learning outcomes. Leung and Chu (2020), on the other hand, report that active learning components are even more critical for students in their first year of higher education, especially in numerical sciences.

The technology-supported teaching area in the virtual classroom used for ERT is not compatible with the teaching area and materials used in the classroom in face-to-face education. This has made it challenging to present the content of the lessons that are written, drawn, and shown on the blackboard, especially in practice-based lessons. Callaghan and colleagues (2009) reported that the virtual learning environment to be provided, especially for engineering education should support advanced social network connections: three-dimensional, where participants can communicate and even socialize.

Despite the efforts to preserve the sameness, the ERT necessitated the revision of the learning outcomes on a course basis and the evaluation criteria to be stretched. This is also emphasized in the research that Gelles and colleagues (2020) completed with data collected from an engineering faculty in the USA. Participants in the study reported that they had to stretch the existing curriculum and evaluation criteria during the transition to ERT.

In the evaluation of learning outcomes in emergency distance education, there have been problems with the reliability of the ones applied for evaluation (assignment or exam). Thus, it is unclear to what extent the learning outcomes targeted for the course are achieved by the students. At this point, Osman (2020) states that alternative evaluation applications (electronic portfolio, research

reports, student presentations...) in ERT should be used together with classical evaluation applications such as homework and exams.

Despite its negativities in teaching and evaluation, ERT has reduced the risk of getting sick due to the epidemic. In terms of instructors, it is a critical gain to have experienced distance education, which is technology-supported, without time and space restrictions, and which is predicted to be student-centered, even with ERT. Kocoglu and Tekdal (2020) determined that the benefits of distance education are its accessibility, flexibility, and resource sharing. According to another study completed in Ireland, ERT is nevertheless positive as it ensures academic continuity. However, the expectation for student achievements in ERT has decreased. This has put pressure on the sustainability of ERT, which is structured on an unplanned construct (Egan & Crotty, 2020).

When the functionality of the application is evaluated in the context of the efficiency of ERT; Although it was determined that the learning and teaching parties could not participate properly, a minimal amount of resources could be shared, and there were some essential deficiencies in the system, it was understood that the necessary corrections or improvements could not be processed instantly into the system. According to Jingrong Xie and colleagues (2021), institutional support and resources should be increased in order for ERT to fulfill the expected role; distance education should be made a compulsory part of the professional development of instructors, and digital equality should be provided for both learners and instructors.

Erhan and Gumus (2020) reported that the impact of the epidemic on education was “chaotic” (p. 198). As a matter of fact, it can be evaluated that there is confusion in the university within the scope of this research. With the findings obtained from the research, the following points should be considered in order to make the application *efficant*, *effective* and *efficient* in case of ERT or continuation of ERT:

1. Digital equality should be provided for ERT. In this direction, readiness should be tested. The technology to be used in ERT should be decided by considering the country, university, users: internet connection, its speed, technology use skills of the users, and having the relevant technology.

2. All academic units of the university should have learning programs that continuously improve the technology and digital skills of teaching staff and students.

3. ERT should be included in the emergency management plans of all universities with functionality that can be activated immediately when needed.

4. Depending on the university's emergency management plan, all academic units affiliated with the university should have their own emergency plans. Academic units should decide for themselves which technological platform they will use in accordance with their teaching processes to be used in emergencies.

5. All academic units should keep the materials and teaching resources (course notes, resource books, virtual courses, laboratory records, etc.) that they will use in ERT ready and up to date so that they can switch to distance education at any time. Academic staff and students of the academic unit should be able to access these resources at any time.

6. The minimum learning criteria for each course and the minimum time to be allocated for learning should be determined by the lecturers of the course. Both lecturers and students should be made responsible for completing these criteria.

7. Whether the course outcomes are acquired properly in ERT should be ensured by measurement and evaluation methods that are supported by alternative evaluation methods, whose validity and reliability are provided, and which can be monitored and audited.

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