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Reflections of COVID-19 on Teacher Education: A Metaphor Study for Distance Education*

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Abstract

Due to the COVID-19 pandemic, distance education replaced face-to-face education in the 2019-2020 academic year in Turkey. This basic qualitative study was conducted to show the metaphorical perceptions of teacher candidates about synchronous distance university education. In this study, 178 teacher candidates, including 79 secondary mathematics, 49 science, and 50 elementary teacher candidates studying in a public university in the Central Anatolia Region in the 2019-2020 academic year, were selected with the convenience sampling method. The data were collected online due to the pandemic with an online form which includes the phrase “Distance university education is like… because…”. The teacher candidates provided 173 well-structured metaphors about distance education. The content analysis method was used for data analysis. The findings obtained in this study showed that comfort, YouTube, home, incomplete, comfort, holiday, and emptiness metaphors were particularly used. Metaphors used by teacher candidates were collected under 17 different categories as "hardware", "satisfaction", "interaction", "future", "need", "complex", "comfort", "obligation", "motivation", "spiritual", "virtual", "systemic", "responsibility", “accessibility”, “suitability”, “efficiency” and “time”. The content analysis results revealed thatmetaphors differed according to the needs and nature of the departments. It is recommended to create solutions specific to the departments and prefer distance education methods suitable for the lessons.

Keywords: COVID-19, distance education, synchronous lessons, teacher candidate

1. Introduction

COVID-19, which started as an epidemic in China at the beginning of 2020 and turned into a pandemic, started to spread in Türkiye in the first months of 2020, causing concern that education and training activities will accelerate the spread of the epidemic. With the decision taken by Higher Education Institution (YÖK) on March 18, 2020, face-to-face education activities were halted in the spring term of the 2019-2020 academic year, and it was decided to carry out education in higher education in the form of distance education (YÖK, 2020). Due to the COVID-19 pandemic, which spread rapidly worldwide, YÖK took a decision and all universities in

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Türkiye had switched to distance education within their own structure. Courses were carried out on internet-based platforms. There are two basic models, synchronous and asynchronous, for internet-based distance education activities. Education in which the teacher and the student interact with each other at the same time and from different places is defined as synchronous distance education, while asynchronous distance education is defined as education in which the necessary information and documents for the student are shared with the student regardless of time and without any live interaction (Hirumi, 2002). With the help of internet-based applications, synchronous or asynchronous educations enable teachers and learners to continue their education independently of the location.

It has been observed that distance education has negative effects on the socialization of students (Kucukgencay & Peker, 2023; Nor, Hamat & Embi, 2012) and teacher candidates generally have a negative attitude towards synchronous distance education (Akdemir & Kılıç, 2020; Karatepe, Küçükgençay & Peker, 2020; Tuncer & Bahadır, 2017). Another group involved in the distance education process is teacher candidates. Teacher training is critical for training qualified and effective teachers and increasing the quality of education. Increasing the quality of the education system will undoubtedly contribute to social development. In the literature, it has been stated in the studies conducted with teacher candidates during the COVID-19 pandemic that distance education has a negative effect on the socialization of students (Duman, 2020; Kaleli-Yılmaz & Güven, 2015), it is difficult to communicate in distance education (Altun-Ekiz, 2020; Altuntaş-Yılmaz, 2020; Duman, 2020; Karatepe et al., 2020), students have negative attitudes towards distance education (Kaleli-Yılmaz & Güven, 2015; Öztürk, Kırcı & Turan, 2021; Yolcu, 2020), they experience motivation problems (Hebebci, Bertiz & Alan, 2020; Özer & Turan, 2021) and they experience technical difficulties (Duman, 2020; Karatepe et al., 2020).

Along with these studies, it is important to use different techniques that will reveal the deeper perceptions of teacher candidates. Using different data collection tools and methods to determine the perceptions of students regarding distance education will make a deeper contribution to the literature. Metaphors are useful data collection tools to reveal the perceptions of the participants about a subject. Metaphors, which do not only create rhetoric by embellishing the language used in daily life, have a more comprehensive place in human life (Saban, 2004). The reason why metaphor is mentally strong is that it establishes a connection between two dissimilar cases and allows the person to perceive a case differently (Saban, 2008). Metaphors offer a new meaning and perspective to the case by establishing a relationship between a familiar expression and another familiar expression. Thus they reduce complexity and provide a clearer understanding of cases (Burke, 1989). In addition to increasing clarity and comprehensibility, they have an important place in educational research. They are also used to determine the meanings students attribute to any concept (Saban, 2004). Metaphors are very useful tools to determine the perceptions of users.

In the literature, some studies attempt to determine the perceptions of distance education with metaphors before the COVID-19 pandemic (Çivril, Aruğaslan & Özaydın-Özkara, 2018; Erten, 2020; Fidan, 2017; Kaleli-Yılmaz & Güven, 2015; Taş, Yavuzalp & Gürer, 2016; Tuncay, Stanescu & Tuncay, 2011; Usta, 2019). Along with these studies, metaphor studies with university students are also encountered in the literature to determine the perceptions of distance education during the COVID-19 pandemic period (Aksoy, Bozkurt & Kurşun, 2021; Bozdağ & Dinç, 2020; Kan & Özmen, 2021; Öztürk et al., 2021). However, these studies did not evaluate whether the perceptions of teacher candidates differ according to the departments, and therefore these studies only provide a snapshot of emergency distance education. Although Turgut and Yıldırım (2022) conducted a study comparing the perceptions of different departments towards distance education, it is understood that the number of participants included in the study according to the departments is low. It is thought that a study that would review the perceptions of teacher candidates studying

in different departments towards distance education with larger study groups and thus examine how the perceptions of teacher candidates towards distance education differ according to departments can fill this gap in the literature. Thus, it will be possible to determine what kind of measures can be taken for different types of programs in the future by revealing the perceptions and needs of the participants according to the programs they are enrolled in.

1.1. Aim of the Study

This study aimed to determine the perceptions of the participants studying in different departments about distance education with the help of metaphors due to the COVID-19 pandemic and reveal the similar and different aspects of metaphors according to the departments. For this purpose, answers were sought to the following questions.

1. Under which categories can the metaphors developed by the teacher candidates be classified in terms of similarity and common features?
2. What are the metaphors developed by the secondary mathematics, science and elementary teacher candidates for the concept of distance education?
3. What are the similarities and differences between the metaphors developed by the secondary mathematics, science and elementary teacher candidates for the concept of distance education?

2. Method

2.1. Study Model

This study, which was conducted to determine the metaphorical perceptions of teacher candidates about synchronous distance education, was designed in a basic qualitative study design. This design is frequently used in all disciplines as well as in social sciences and educational research (Merriam, 2009). With this design, this study aimed to understand the participants' experiences of synchronous distance education, their perceptions of these experiences and what meaning they attributed to these experiences (Altheide & Johnson, 2011). Another reason for this preference was that the number of teacher candidates was high and the opinions of all teacher candidates participating in this study were collected through a form (Anılan, 2017).

2.2. Study Group

This study consisted of 178 teacher candidates enrolled in the education Faculty of a Public University in the Central Anatolia Region and taking synchronous distance courses in the spring semester of the 2019-2020 academic year. The participants of this study were selected according to the convenience sampling method, one of the purposive sampling methods. The convenience sampling method can be defined as the researcher's directing towards the easiest items to access while forming the sample from the target universe (Patton, 2002). The reason for this preference was that it was very difficult to reach teacher candidates studying at other universities due to the COVID-19 pandemic, which spread rapidly in Türkiye and in the world, and the measures taken to control the pandemic. The personal characteristics of the teacher candidates in the study group are given in Figure 1.

When the data in Figure 1 were examined, it was understood that the participants consisted of 178 teacher candidates, 79 of whom were secondary mathematics teacher candidates, 49 science teacher candidates and 50 elementary teacher candidates; 140 of the participants were female and 38 of them were male. None of the participants had taken a course with synchronous distance

education before. In addition to the data in Figure 1, the average age of the participants was 20.91, while the average number of distance synchronous undergraduate courses they took was 7.14.

Figure 1. *Demographic Data of the Study Group*

2.3. Data Collection Tool and Process

An online form consisting of two parts was designed for data collection. The first part consisted of questions asked to collect personal data, such as whether they had taken distance education courses before, gender, age, class, and number of synchronous courses taken, to determine the personal characteristics of teacher candidates. In the second part, the participants were asked to complete the sentence "Distance university education is like … because …". Also, information about the purpose of this study, for what purpose the collected data would be used, what the metaphor expressions were and a clarification text containing two metaphor examples was added to this online form. Examples of metaphors given in the clarification text are as follows:

- ✓ "Mathematics is like oxygen because we always have to use it."
- ✓ "Peace is like a flower, because if you don't take care of it and water it, of course, it will disappear."

This study aimed to enable teacher candidates to make a connection and draw an analogy between distance undergraduate education (the subject of the metaphor) and the metaphors they would produce (the source of the metaphor) with the expression "like," and to explain the reasons or logical basis of these metaphors with the expression "because" (Saban, 2009).

This study was conducted online due to the COVID-19 pandemic at the time of this study. This study was conducted five weeks after the teacher candidates started their distance education. Thus, it was aimed that teacher candidates experienced the distance education process enough before participating in the survey. Then, the data collection form was processed into Google Forms and a shareable link was created. This link was shared with the participants by the lecturers conducting the courses, and the participation of the teacher candidates in this study was ensured on voluntarily. The questionnaire designed through Google Forms was left open for data collection for six days, and at the end of the sixth day, the form was closed for data entry. As a result of this study, 178 answered online questionnaire forms were obtained and these forms were used as the main data source of this study.

2.4. Data Analysis

Following the data collection process, the obtained data were analyzed with the content analysis method, which is frequently used in qualitative research. Therefore, this study aimed to reach the concepts and relationships that can explain the collected data and organize and interpret these data (Yıldırım & Şimşek, 2018). In this study, the data were analyzed under the headings of naming, classification and category development.

Naming Stage: At this stage, the metaphors were coded as İ1-İ79, F1-F49, S1-S50 according to the departments of the participants and the order in which the online form was answered (İ= Secondary Mathematics teacher, F= Science teacher, S= Elementary teacher). After coding, the metaphors collected were listed alphabetically with the help of an Office program.

Classification Stage: At this stage of the analysis process, it was understood that some of the participants did not produce logical and acceptable metaphors, and these metaphors (n=5) were removed from the data set. After eliminating these metaphors, the online form containing the remaining 173 metaphors (78 secondary mathematics, 47 science and 48 elementary teacher candidates) was subjected to the category development stage.

Category Development Stage: At this stage, 173 metaphors obtained with content analysis at the classification stage were analyzed regarding common features and the metaphors determined to have common features were collected under the same group. Each metaphor was associated with a specific category, given the reasons and logical basis of the participants. Therefore, although some of the metaphors created by the participants were the same as words, they were placed under different categories regarding the reasons and logical basis they stated after the expression "because." At this stage, 17 different categories were created for teacher candidates for the concept of distance education.

2.5. Validity and Reliability

Not to affect the thoughts of the participants during this study, the participants filled out the form voluntarily. Data indicating who the participants were was not requested in the online form. The online form was sent to the participants using a link and the sample metaphors included in the explanation part of the form were not selected from the metaphors involving distance education. Since credibility and transferability are critical to ensure the validity of the study, the personal characteristics of the participants, data collection and analysis processes were explained in detail and the metaphors created by the participants were presented without any comments (Creswell, 1998). Also, direct quotations from the answers given by the participants were provided to ensure validity.

To ensure the reliability of this study, the data sets were coded independently by three experienced coders; a Turkish education expert, a mathematics education expert, and an information technology expert. The first list of 173 metaphors obtained and the reasons for these metaphors, and a second list of 17 categories and brief explanations of these categories, were given to another expert in qualitative analysis (mathematics education specialist). The expert was asked to match the items in these two lists. After this process, consensus and disagreement were compared. The reliability of this study was 97.58% according to the formula of Miles and Huberman (1994: 64). Four metaphors with disagreement (wealth, tunnel, peace, school) were discussed, and the coders came to a complete agreement on this issue.

2.6. Ethics Committee Approval

Ethics committee approval for this study was obtained with the decision of the Social and Human Sciences Scientific Research Ethics Committee of Necmettin Erbakan University, dated 20.10.2020 and numbered 2020/21.

3. Findings

In this part, the metaphors created by the secondary mathematics, science and elementary teacher candidates for "distance undergraduate education," the categories created based on the common features of these metaphors, and the frequencies and percentages of these categories are presented in tables. Also, these categories were supported with direct quotations from the participants**.**

3.1. Metaphors Created by Teacher Candidates regarding Distance Undergraduate Education

In the analysis of the findings obtained in this study, it was understood that the secondary mathematics, science and elementary teacher candidates created 173 valid metaphors related to "distance undergraduate education". In Figure 2, the metaphors created by the teacher candidates are presented as a word cloud according to their frequency of use.

Figure 2. *Metaphors Created by the Teacher Candidates related to Distance Undergraduate Education*

As shown in Figure 2, it was seen that the most used metaphor by teacher candidates was easiness. Also, it was understood that the metaphors of YouTube, home, incomplete, comfort, vacation and space, which were the most prominent in the word cloud, were used more by the participants than other metaphors. The 173 metaphors created by the secondary mathematics (78), science (47) and elementary teacher (48) candidates for distance education were grouped under 17 different categories, considering their common features as well as the reasons for their use. These categories and the frequencies and percentages of the metaphors included in the categories are presented in Figure 3.

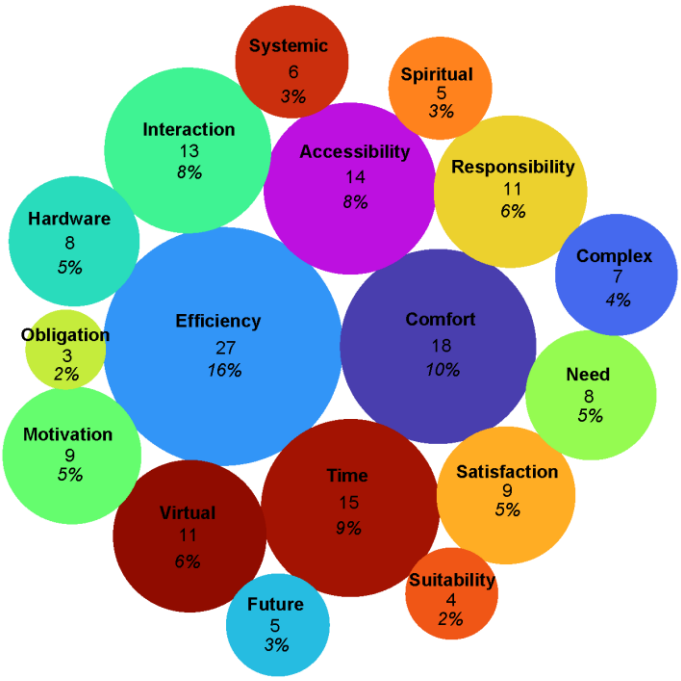

Figure 3. *Distribution of Metaphors Created by the Teacher Candidates related to Distance Undergraduate Education by Categories*

The 17 categories created as a result of the analysis of the metaphors used by the participants for distance undergraduate education were listed independently according to the departments of the teacher candidates and presented in tables. Also, the frequencies and percentages of the metaphors produced by the participants and the direct quotations from the teacher candidates for each of the categories created are included in the tables. The categories are presented in alphabetical order. The metaphors of the teacher candidates regarding the "accessibility" category, the direct quotations and the distribution of these metaphors according to the departments are given in Table 1.

Table 1

Metaphors of the "Accessibility" Category

Department	Metaphors	Example Quote	f	%
Secondary Mathematics	Racehorse, Convenience, Easiness	"Distance undergraduate education is like a racehorse because I can attend the lesson from anywhere, whether it is a grass track, a sand track or a synthetic track."	3	3.8
Science	Inclusive, Private Aircraft, Easiness	"Distance undergraduate education is like having a private plane because we don't have to worry about traffic and transportation. We can connect from our home."	3	6.4
Elementary	Home, Comfort, Free Cinema, Teleport, Bridge, Convenience, Home Office, Easiness	"Distance undergraduate education is like teleporting because it saves time on the road. I'm in class a minute before class."	8	16.7
General			14	8.1

As seen in the data in Table 1, 14 metaphors were produced by the participants under the "Accessibility" category. This category was the third dominant category of this study and it was

the category in which elementary teacher candidates produced metaphors the most. According to the metaphors used by the participants, it was understood that one of the biggest advantages of distance education was that it was easily accessible. Being able to attend the lesson regardless of the place and not wasting time and effort to reach the school was the common point of the participant metaphors evaluated under the category. The metaphors with the highest frequency of repetition under the category were metaphors of convenience and easiness. The metaphors of the teacher candidates regarding the "comfort" category, the direct quotations and the distribution of these metaphors according to the departments are presented in Table 2.

Table 2

Metaphors of the "Comfort" Category

Department	Metaphors	Example Quote	f	%
Secondary Mathematics	Home, Bed, Comfort, Easiness (3), Freedom, Pillow	"Distance undergraduate education is like a pillow because I can watch the lesson while lying down."	8	10.3
Science	Coffee in hand, Peace, Easiness	"Distance undergraduate education is like a coffee in your hand because I can listen to the lesson while sipping my coffee at home."	3	6.4
Elementary	A great privilege, Home, Easiness (2), Comfort, Pleasant, Unlimited internet,	"Distance undergraduate education is like unlimited internet because easiness is at the heart of it."	7	14.6
General			18	10.4

As shown in Table 2, there were 18 metaphors under the "Comfort" category, and this category was the second category of this study that contained the most metaphors. In the analysis of the metaphors used by the teacher candidates, the comfort and convenience of the teacher candidates provided by distance education during the lessons were prominent. It was understood that the metaphor of easiness under this category was the dominant metaphor, as in the whole study. The most used metaphors after easiness were home and comfort metaphors. In the analysis of the distribution of the metaphors regarding the "comfort" category by the departments the participants studied, the elementary teacher candidates classified 14.6% of the metaphors under this category. The metaphors created by the participants and collected under the "complex" category, examples of metaphors and the distribution of these metaphors according to the departments of the participants are given in Table 3.

Table 3

Metaphors of the "Complex" Category

Department	Metaphors	Example Quote	f	%
Secondary Mathematics	Rocky Road, Broken Seat	"Distance undergraduate education is like a rocky road because we see difficulties and confusion from time to time while getting us to our goal."	2	2.6
Science	Comedy, Eating, Comfortable Discomfort, Pop-Up Ads on Sites	"Distance undergraduate education is like pop-up ads on websites because course hours can change in a minute."	4	8.5
Elementary	Erasmus	"Distance undergraduate education is like Erasmus because it is difficult to get used to, but if it works, it will be more beneficial for our education."	1	2.1
General			7	4.0

As seen in Table 3, there were seven different metaphors under the category of "complex". According to the metaphors used by the participants, distance education created an environment of confusion within itself. Difficulties experienced during lessons and changing programs complicated education. Science teacher candidates produced the most metaphors under this category. The metaphors of the teacher candidates regarding the "efficiency" category, the direct quotations and the distribution of these metaphors according to the departments are presented in Table 4.

Table 4

Metaphors of the "Efficiency" Category

Department	Metaphors	Example Quote	f	%
Secondary Mathematics	Waste of Time, Comfortable But Semi-Effective, Incomplete (2), Infertile Soil, Swimming with a T-Shirt, Blank Notebook, Space (2), Request for Compensation, Incomprehensibility, Torture, A Reluctant Teacher, Not Being Understood, Empty, Looking But Not Seeing, A Little Difficult, Present But Absent	"Distance undergraduate education is like infertile land because there is labour, but this land cannot give us the crop we want." "Distance education is like swimming in a t-shirt because you can swim but you can't sunbathe."	18	23.1
Science	Mediocre Education, Barren Land, Wasted Time, Motherless Child, Not Existing Despite Being There	"Distance education is like a motherless child because somehow it grows, but something is always missing."	5	10.6
Elementary	Jigsaw Puzzle, Desert Lands, Foreign Language, Formal Education	"Distance undergraduate education is like a desert land because it is inefficient and empty."	4	8.3
General			27	15.6

As shown in the data in Table 4, there were 27 metaphors under the "Efficiency" category. This category was the most dominant category of this study. In the analysis of the metaphors used by the teacher candidates, it was understood that they usually did not have the desired efficiency from distance education courses. The participants considered that distance education was insufficient compared to face-to-face and that the courses cannot contribute to their academic development at the desired level. In the analysis of the distribution of the metaphors regarding the "Efficiency" category by the departments the participants studied, the metaphors used by the secondary mathematics teacher candidates were mostly under this category at 23.1%, while this rate is 8.3% for the elementary teacher candidates. The metaphors with the highest frequency of repetition under the category were the metaphors of space and incomplete. The metaphors created by the teacher candidates and collected under the "future" category, examples of metaphors and the distribution of these metaphors according to the departments of the participants are given in Table 5.

Table 5

Metaphors of the "Future" Category

Department	Metaphors	Example Quote	f	%
Secondary Mathematics	The Benefit of Technology, The Educational Model of the Future	"Distance undergraduate education is like the education model of the future because in the future everything will be digital."	2	2.6
Science	Tunnel, School	"Distance undergraduate education is like a tunnel because just as the end of a tunnel is invisible, so is the future of this form of education."	2	4.3
Elementary	Building on a Broken Foundation	"Distance undergraduate education is like a building on a broken foundation because this system, which is made in haste, is about to collapse."	1	2.1
General			5	2.9

As shown in Table 5, there were five different metaphors under the category of "Future." In the analysis of the metaphors by the participants, it was significant that the metaphors regarding the fact that distance education was the future of education, but this education method was not adequate for now and should be developed. The metaphors and metaphor examples of teacher candidates under the category of "hardware" are given in Table 6.

Table 6

Metaphors of the "Hardware" Category

Department	Metaphors	Example Quote	f	%
Secondary Mathematics	Suffering, Getting Disconnected From Class, Anxiety, Tension-Nervousness, Disadvantage	"Distance undergraduate education is like anxiety because if you don't have a good computer and a fast internet connection, it freezes all the time."	5	6.4
Science	Torture	"Distance undergraduate education is like torture because I'm trying to see presentations on my tiny phone."	1	2.1
Elementary	Complicated, Technology	"Distance undergraduate education is like technology because first of all, sufficient hardware is needed for the course"	2	4.2
General			8	4.6

As seen in Table 6, there were eight metaphors under the "hardware" category. Examining the statements of teacher candidates, it was understood that distance education was seen as a very troubling process for students who did not have sufficient technological hardware and a quality and unlimited internet connection. The metaphors under the "interaction" category, examples of metaphors and the distribution of these metaphors according to the departments of the participants are given in Table 7.

Table *7*

Metaphors of the "Interaction" Category

Department	Metaphors	Example Quote	f	%
Secondary Mathematics	Open Education, Youtube, Bad Education, Movie, The Disconnection With The Teacher, Boring	"Distance undergraduate education is like a movie because we just watch it."	6	7.7
Science	Inefficient, Online Game, Boredom, Mute	"Distance undergraduate education is like an online game because we can reach the goal by communicating well so that distance education can be efficient."	4	8.5
Elementary	Discomfort, Movie, Anti-sociality	"Distance undergraduate education is like discomfort because I cannot express myself enough in online education."	3	6.3
General			13	7.5

As seen in Table 7, 13 metaphors were grouped under the "Interaction" category. In the analysis of the metaphors by the participants, one of the main problems of distance education was the low interaction between the instructor and the student and the limited communication of the participants with their instructor and classmates. It was seen that the most used metaphor under this category was the movie metaphor. The metaphors created by the participants and collected under the "motivation" category, examples of metaphors and the distribution of these metaphors according to the departments of the participants are given in Table 8.

Table 8

Metaphors of the "Motivation" Category

Department	Metaphors	Example Quote	f	%
Secondary Mathematics	Difficulty, Monotone, Confusion, A Glitter Ball, Vacation	"Distance undergraduate education is like a glitter ball because I am constantly distracted and unable to focus."	5	6.4
Science	Inefficient, Laziness, Carelessness,	"Distance undergraduate education is like laziness because I don't want to get out of bed and attend classes."	3	6.4
Elementary	Surface Learning	"Distance undergraduate education is like surface learning because there is no discipline and motivation as in school."	1	2.1
General			9	5.2

As shown in Table 8, there were nine metaphors under the "Motivation" category. In the analysis of the metaphors used by the participants, it was understood that the participants had difficulties concentrating on the lessons with the distance education system. The metaphors created by the participants and collected under the "need" category, direct quotations from the participants and the distribution of these metaphors according to the departments of them are given in Table 9.

Table 9

Metaphors of the "Need" Category

Department	Metaphors	Example Quote	f	%
Secondary Mathematics	Medication (2), Compulsory Condition, Saviour	"Distance undergraduate education is like medicine because it will heal our wounds."	4	5.1
Science	Saviour	"Distance undergraduate education is like a saviour because, without such a system, our education would be disrupted."	1	2.1
Elementary	Miracle, Air, Piece of Wood	"Distance undergraduate education is like a piece of wood because even if the ship sinks, that piece of wood is the only way to survive."	3	6.3
General			8	4.6

In the analysis of Table 9, it was seen that eight metaphors are classified under the "Need" category. In the analysis of the metaphors by the teacher candidates, they had the perception that distance education was a system used to meet the need for education under pandemic conditions. It was seen that the most used metaphors under the category of "Need" were medicine and saviour metaphors. The metaphors of the teacher candidates regarding the "obligation" category, the direct quotations and the distribution of these metaphors according to the departments are given in Table 10.

Table 10

Metaphors of the "Obligation" Category

Department	Metaphors	Example Quote	f	%
Secondary Mathematics	Open Education	"Distance undergraduate education is like remote/open education because it is compulsorily carried out without going to school."	1	1.3
Science	The Person I Put Up With Because of Our Mutual Friend	"Distance undergraduate education is like the person I put up with because of our mutual friend because no matter how much I dislike it, I put up with it because I have to."	1	2.1
Elementary	Turning Disadvantage into Advantage	"Distance undergraduate education is like turning a disadvantage into an advantage because we have to turn this extraordinary situation into an advantage with this current system that we are obliged to."	1	2.1
General			3	1.7

As seen in the data given in Table 10, there were three different metaphors under the category of "Obligation". This category was with the least metaphors in the study. The metaphors participants created showed that the participants were obliged to study with this system. To them, this system was like an obligation. The metaphors created by the participants and collected under the "responsibility" category, examples of metaphors and the distribution of these metaphors according to the departments of the participants are given in Table 11.

Table 11

Metaphors of the "Responsibility" Category

Department	Metaphors	Example Quote	f	%
Secondary Mathematics	Wake Up Alarm, Mirror, Self Improvement	"Distance undergraduate education is like a mirror because what you do is what you get in return."	3	3.8
Science	Preparing for University Exam, Social Media, Vacation, Space, Art, Get a Loan	"Distance undergraduate education is like getting a loan because you have to work to pay it back!"	6	12.8
Elementary	Sea, Responsibility	"Distance undergraduate education is like the sea because if you stop swimming, you will sink."	2	4.2
General			11	6.4

As seen in the data presented in Table 11, there were 11 different metaphors under the category of "Responsibility." The statements of the teacher candidates showed that the idea that they were largely responsible for the distance education process was dominant. The majority of the participants, whose metaphors were evaluated under the category of "Responsibility," stated that to be successful in this system, their effort had to be continuous and the responsibility was on their shoulders. Science teacher candidates produced the most metaphors under this category. Also, this category was the category in which science teacher candidates created metaphors the most. The metaphors of the teacher candidates regarding the "satisfaction" category, the direct quotations and the distribution of these metaphors according to the departments are given in Table 12.

Table 12

Metaphors of the "Satisfaction" Category

Department	Metaphors	Example Quote	f	%
Secondary Mathematics	Family in Expat, Broccoli, Incomplete Wishes	"Distance education is like broccoli because it's useful but has no flavour at all."	3	3.8
Science	A Big Slice of Cake, Dessert	"Distance undergraduate education is like dessert because dessert is a beautiful thing, but its harm is more than its beauty."	2	4.3
Elementary	Recipe Cooking, Teaching Baby to Cook, Hormone-injected Strawberry, Wealth	"Distance education is like a hormone-injected strawberry because there is education but you don't get a taste."	4	8.3
General			9	5.2

In the analysis of Table 12, it was seen that nine metaphors were classified under the "Satisfaction" category. The metaphors created by the teacher candidates showed that distance education was useful and necessary at first glance, but they had some concerns about this education method. The metaphors used by the teacher candidates and collected under the "spiritual" category, examples of metaphors and the distribution of these metaphors according to the departments of the teacher candidates are given in Table 13.

Table 13

Metaphors of the "Spiritual" Category

Department	Metaphors	Example Quote	f	%
Secondary Mathematics	Formal Education, Confusion, Space	"Distance education is like a space because I feel aimless and terrible because of it."	3	3.8
Science	Stress	"Distance undergraduate education is like stress because we are not used to it."	1	2.1
Elementary	House	"Distance undergraduate education is like a house because my mind and mood are always messy."	1	2.1
General			5	2.9

As understood from Table 13 under the category of "Spiritual," there were five different metaphors. Considering the metaphors evaluated under the category, it was understood that the participants related distance education with concepts, such as stress, confusion and space, and they did not feel well mentally. The metaphors of the teacher candidates regarding the "suitability" category, the direct quotations and the distribution of these metaphors according to the departments are presented in Table 14.

Table 14

Metaphors of the "Suitability" Category

Department	Metaphors	Example Quote	f	%
Secondary Mathematics	-	-	0	0.0
Science	Inconsistent, Irresponsible, Compulsive, Incomplete	"Distance undergraduate education is like something inconsistent because while it is very suitable for some courses, it is really insufficient for some courses and most of the subjects are skipped."	4	8.5
Elementary	-	-	0	0
General			4	2.3

As can be seen from Table 14, there were four different metaphors under the "Suitability" category. All of the metaphors evaluated under the category were produced by science teacher candidates. In the analysis of the metaphors, it was understood that the participants did not find distance education appropriate for some courses. It was a common thought that distance education was especially not suitable for applied courses. The metaphors of the teacher candidates regarding the "systemic" category, the direct quotations and the distribution of these metaphors according to the departments are presented in Table 15.

Table 15

Metaphors of the "Systemic" Category

Department	Metaphors	Example Quote	f	%
Secondary Mathematics	Uncertainty, Death, Missing	"Distance undergraduate education is like death because there is no internet and the system is bad."	3	3.8
Science	-	-	0	0.0
Elementary	Village Water System, Broken Clock, Difficulty	"Distance undergraduate education is like the village water system because it is constantly being cut off."	3	6.3
General			6	3.5

In the analysis of Table 15, it was seen that six metaphors are classified under the "Systemic" category. In the analysis of the metaphors created by the teacher candidates, it was understood that they experienced difficulties due to the lesson system during the distance lessons. The slowness, inadequacy and constant system interruption disturbed the teacher candidates. It was understood that none of the metaphors created by science teacher candidates were classified under this category. The metaphors of the teacher candidates regarding the "time" category, the direct quotations and the distribution of these metaphors are given in Table 16.

Table 16

Metaphors of the "Time" Category

Department	Metaphors	Example Quote	f	%
Secondary Mathematics	Snack, Convenience, Youtube, Studying at home (2), Easiness, Water	"Distance undergraduate education is like water because I open and drink whenever I feel like it."	7	9.0
Science	Youtube, Repetition	"Distance undergraduate education is like YouTube because we can listen to our lesson whenever we want, so there is no time problem."	2	4.3
Elementary	TV series (2), Easiness A Good System Freedom, Holiday	"Distance undergraduate education is like a TV series because you can open and listen to the lesson whenever you want."	6	12.5
General			15	8.7

As understood from Table 16, under the category of "time", there were 15 metaphors and this category was the third category of this study that contained the most metaphors. According to the metaphors used by the participants, one of the advantages of distance education was that they could follow the lessons regardless of time. Although the participants in this study attended synchronous courses during their distance education, they could take the courses again whenever they wanted, thanks to their course records. The most frequently repeated metaphors under the category of "time" are studying at home, TV series, YouTube and easiness metaphors. In the analysis of the distribution of the metaphors regarding the "Time" category by the departments the participants studied, it was seen that 12.5% of the metaphors by the elementary teacher candidates and 9% of the metaphors by the secondary mathematics teacher candidates were evaluated under this category. The metaphors of the teacher candidates regarding the "virtual" category, the direct quotations and the distribution of these metaphors according to the departments are presented in Table 17.

Table 17

Metaphors of the "Virtual" Category

Department	Metaphors	Example Quote	f	%
Secondary Mathematics	Celebrity, Dream, Sky, Youtube (2)	"Distance undergraduate education is like a celebrity because we see it on screen but not in real life."	5	6.4
Science	Cropped Picture, Internet Search, Disadvantage, Getting Lost in a Virtual Life, Artificial Flower	"Distance undergraduate education is like an artificial flower because it's like the real thing but it's imitation."	5	10.6
Elementary	Eating Plastic Fruit	"Distance education is like eating plastic fruit because it has no taste, just looks."	1	2.1
General			11	6.4

As seen in the data presented in Table 17, there were 11 different metaphors under the category of "virtual". The metaphors created by the participants showed that distance education was seen as an artificial environment that had no place in reality, did not exist in reality, but was designed in mind. Elementary teacher candidates produced the least number of metaphors under this category. The metaphor with the highest frequency of repetition under the category is the metaphor of YouTube.

4. Discussion and Conclusion

This study showed that teacher candidates produced 173 well-structured metaphors related to the concept of distance education during the COVID-19 pandemic period. The metaphors were classified under 17 different categories as "hardware", "satisfaction", "interaction", "future", "need", "complex", "comfort", "obligation", "motivation", "spiritual", "virtual", "systemic", "responsibility", “accessibility”, “suitability”, “efficiency” and “time”. It can be said that this is an indication that the concept of distance education cannot be explained with a single metaphor or category and that teacher candidates’ perceptions are spread over a wide range.

In the analysis of the categories created based on the metaphors by the teacher candidates, it is understood that the metaphors created by the secondary mathematics teacher candidates who participated in the study were classified under 16 different categories. Secondary mathematics education students did not develop a metaphor under the category of "suitability"; they were the dominant group (23.1%), especially under the category of "efficiency", which was the most dominant category of the research, and differed significantly from other groups. This is an indication that approximately one-fifth of the secondary mathematics teacher candidates' ideas about the concept of distance education are shaped by the inability to get sufficient academic efficiency from distance education courses. Under the same category, 10.1% of the metaphors created by the science teacher candidates and 8.3% of the metaphors by the elementary teacher candidates were included. It can be easily said that the reason for this significant difference is that department courses taken by secondary mathematics teacher candidates include more numerical and operation-based courses due to their structure compared to other departments. Also, in the categories in which the metaphors created by the secondary mathematics teacher candidates are classified, it is seen that the categories that stand out after the "efficiency" category are "comfort" (10.3%), "time" (9%) and "interaction" (7.7%). These data and metaphors show that the sustainability of the distance education process, regardless of time and place, is seen as an advantage for secondary mathematics teacher candidates, while poor interaction is a disadvantage. Considering the categories of “accessibility” (3.8%), “satisfaction” (3.8%), “responsibility” (3.8%) and “obligation” (1.3%), secondary mathematics teaching is the department with the lowest percentage. Also, more than half of the metaphors under the category of "hardware" (6.4%) were created by secondary mathematics teacher candidates, and it was seen that the group that created the most metaphors under this category was secondary mathematics teaching.

In the analysis of the metaphors by science teacher candidates and the 16 categories in which metaphors were included, it is understood that it is the department that created the most metaphors under the “responsibility” (12.8%), “virtual” (10.6%), “suitability” (8.5%), “interaction” (8.5%) and “complex” (8.5%) categories. Considering these categories and the metaphors included in the categories, it can be said that the main reason for this situation is that the courses in science teaching are based on practice (e.g., physics, chemistry, biology, and science laboratory). These are the courses that require the active participation of the student in the practice process. In the analysis of the metaphors by the science teacher candidates under these categories, it is understood that the participants think that the distance education system is a virtual, complex and interactive

educational environment that does not exist in reality, leaving the responsibility to the student. Also, the fact that all of the metaphors under the category of "suitability" were created by science teacher candidates and that they had the idea that distance education was not suitable for every course, according to the metaphors under this category, supports this argument. Science teacher candidates created the least metaphors under the categories of “comfort” (6.4%), “time” (4.3%), “need” (2.1%) and “hardware” (2.1%). It was also understood that they did not create metaphors under the "Systemic" category. This can be interpreted as there are more dominant factors shaping the thoughts of science teacher candidates regarding the concept of distance education.

In the examination of 16 categories created with the metaphors created by the elementary teacher candidates, it was seen that elementary teacher candidates were the dominant group and differed significantly from other groups under “accessibility” (16.7%), “comfort” (14.6%), “time” (12.5%), “satisfaction” (8.3%) and “systemic” (6.3%) categories. Also, elementary teacher candidates were the group that created the least metaphor under “efficiency” (8.3%), “motivation” (2.1%), “spiritual” (2.1%), future (2.1%), “complex” (2.1%) and “virtual” (2.1%) categories. Based on this, considering the metaphors created by the participants, it can be said that the elementary teacher candidates' perspectives on the distance education process were relatively more positive than the other groups. This situation is similar to the results of Karatepe et al. (2020). It was understood that the comfort of being accessible regardless of the place and the comfort it provided at some points, such as being independent of time, were important details that shapes the ideas of elementary teacher candidates regarding the distance education process. Similarly, in the study of Yolcu (2020), it was seen that elementary teacher candidates expressed similar positive opinions because they could benefit from the advantages of distance education. Also, it was understood that elementary teacher candidates found distance undergraduate courses more efficient than other departments, but they think that it is not satisfactory enough. A crucial reason for this can be the fact that the courses in elementary school teaching are verbal courses and not practical courses compared to secondary mathematics teaching and science teaching, so their perspectives are shaped by the convenience and comfort factors provided by the distance education process.

In the analysis of the metaphors created with the concept of distance education, the highest number of metaphors was classified in the category of "efficiency" (15.6%), and it was understood that the students had the perception that the distance education courses were insufficient and they could not get academically efficient. Similarly, under the category of “satisfaction” (5.2%), there were metaphors that distance education is insufficient and there are deficiencies. In the analysis of the metaphors in the "Interaction" (7.5%) category, it is understood that the participants think that their interaction with the course instructor and classmates is insufficient. However, interaction and communication are very important for constructing knowledge (Yıldız, 2020) and interaction and communication in distance education are seen as necessary components for a successful learning experience (Hirumi, 2002). This parallels the studies of Aksoğan (2020), Aksoy et al. (2021), Altun-Ekiz (2020) and Tuncer and Bahadır (2017), but contradicts the results of Özyürek, Bedge, Yavuz and Özkan (2016). Regarding the lack of interaction and communication, Çivril et al. (2018) and Kaleli-Yılmaz and Güven (2015) also concluded that students created similar metaphors.

It is understood from the metaphors created under the category of "hardware" (4.6%) that students had problems with the internet, technological equipment and connection. Along with the hardware problems, the negativities experienced due to reasons, such as changes in the curriculum, can be seen with the metaphors created in the "complex" (4%) category. Similar categories are observed in the studies of Bozdağ and Dinç (2020) and Öztürk et al. (2021). Also, it is understood from the metaphors under the category of "systemic" (3.5%) that problems were caused by the system in which the courses were conducted. In the analysis of the metaphors created under these categories,

it is understood that some teacher candidates developed a negative perception towards the concept of distance education due to problems caused by internet infrastructure and IT devices, problems arising from the system used for distance education, troubles in the curriculum and unforeseen problems in the distance education process. These are consistent with the results of Aksoğan (2020), Altun-Ekiz (2020), Karatepe et al. (2020), Kırmacı and Acar (2018), Özyürek et al. (2016), Tuncer and Bahadır (2017). Besides, in the study conducted by Kaleli-Yılmaz and Güven (2015), similar metaphors are found under the technical category.

Based on the metaphors of the teacher candidates regarding the courses conducted with distance education under the category of "virtual" (6.4%), it is understood that some teacher candidates see distance courses as a virtual phenomenon that does not exist in reality. Similar categories are also found in the studies of Bozdağ and Dinç (2020) and Erten (2020). In the analysis of the metaphors under the category of "motivation" (5.2%), it is understood that there were students who had difficulties concentrating on distance education lessons and students who did not feel well due to the distance education process when the metaphors classified under the category of "spiritual" (2.9%) are considered. It is also understood from the studies of Hebebci et al. (2020), Karatepe et al. (2020) and Kırmacı and Acar (2018) that distance education leads to negative attitudes due to motivation problems. Also, it is seen that similar metaphors are created under the affective category in the study of Çivril et al. (2018). The metaphors in the category of "responsibility" (6.4%) show that the responsibility in the distance education process is mostly left to the students and there are teacher candidates thinking that their efforts should be continuous. Similar metaphors about responsibility are also found in the studies of Kaleli-Yılmaz and Güven (2015) and Kan and Özmen (2021).

In the analysis of the metaphors of teacher candidates evaluated under the categories of "need" (4.6%), "obligation" (1.7%) and "future" (2.9%), it can be said that the participants had thoughts, such as the fact that the distance education process was an opportunity for them to continue their education due to the COVID-19 pandemic, they needed distance education during this period. It was an obligation for their education. Similar categories are seen in the studies of Aksoy et al. (2021), Kaleli-Yılmaz and Güven (2015), Kan and Özmen (2021), and Usta (2019). It is also observed that some participants saw this system as inevitable for the future of education, but they believed that the deficiencies should be eliminated. Similarly, in the studies of Taş et al. (2016), it is seen that some of the teacher candidates created metaphors showing that they see distance education as a new form of education.

The second most dominant category of the study was "comfort" (10.4%), the third category was "time" (8.7%), and the fourth category was "accessibility" (8.1%). Consequently, it is understood that students have positive approaches to distance education according to the metaphors they created. It can be said that the fact that education can be carried out in the home and family environment, independently of social and classroom norms and rules, space and time, thanks to distance education, shapes the perceptions of the participants. These results are consistent with the metaphors found in the studies of Aksoy et al. (2021), Erten (2020), Taş et al. (2016), and Fidan (2017).

Considering the metaphors created by the participants, it is seen that the metaphors differ in some points according to the departments. This is compatible with the findings of Tuncay et al. (2011) that students are affected by situations, such as their educational background and socio-cultural characteristics, and Fidan (2017), that the metaphors produced by teacher candidates differ according to the department they study. However, Turgut and Yıldırım (2022) concluded that perceptions of teacher candidates about distance education did not differ according to the department.

The main limitations of the present study are that the data were collected online, and this study was conducted with students studying in secondary mathematics teaching, science teaching and elementary teaching programs. Considering the results of the study, it is understood that the perceptions of teacher candidates are shaped according to the departments and the requirements of the departments. It is seen that the metaphors created by the teacher candidates are generally negative, except for those classified under categories, such as "comfort", "time" and "accessibility". The results of this study should be well analyzed and taken into account by educators and policymakers within the framework of the limitations of this study. Although the distance education process started with a sudden decision as a result of an undesirable situation, such as the pandemic and the needs caused by this situation, it definitely needs to be improved. A similar process can happen again, and it is necessary to be prepared for this situation as best as possible.

It is necessary to produce special solutions for each department and use distance education methods suitable for the courses given by the educators. It is essential to use methods and techniques that will increase the efficiency of the lessons so that teacher candidates who will shape the future of our country can access the information they will need. Thus, it is recommended that the faculty members who will teach through distance education should be trained on distance education methods by universities and that this training should be repeated regularly. Also, some measures can be taken for students who do not have sufficient technical infrastructure and hardware.

Although the distance education decision taken due to the pandemic process has ended, distance education continues to be popular in the world and our country. Studies can be conducted to identify the experienced problems, introduce good examples, and determine the affective states (e.g., anxiety, and attitudes) of students and instructors regarding the distance education process. Also, it may be suggested that researchers investigate the reasons underlying the perceptions of teacher candidates about distance education or their opinions on this subject. Conducting this study for students studying in different departments may contribute to the planning and development of this education system.

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Ethics Committee Permission:

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