



## Metaphoric Perceptions of Mathematics Education Students towards Distance Education

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### Abstract

The aim of this study is to determine the perceptions of students studying at undergraduate program in Mathematics Education towards distance education through metaphors. The study group of the research was selected with the convenience sampling technique. Sample consists of 100 elementary school mathematics teacher candidates studying in a state university in the Eastern Anatolia region in the 2020-2021 academic year. Phenomenology design was used in the study. Data collection tool is the opinion form prepared by the researchers. The form was sent online (Mail, WhatsApp) to prospective teachers and asked to fill in, "The distance education system is similar to ..... because ....." the phrase. The obtained data were analyzed using the "content analysis" technique. In line with the findings, 88 different metaphors were obtained. 75% of these are negative, 15% are positive and 10% are variable perceptions depending on the situation. Reasons for the negative perception of the teacher candidates (75%) are emphasized that this system is inefficient-useless, corrosive, inadequate, creating inequality of opportunity, compelling, far from reality and containing uncertainty. On the other hand, reasons for positive perception (15%) are emphasized as providing convenience, being saviour and guide in this process, and should be included in the education system as a result of developing technology. In addition, a small number of pre-service teachers (10%) mentioned that distance education can become positive or negative depending on the situation of the person. Suggestions were made to increase the functionality and effectiveness of distance education.

**Keywords:** Distance education, Mathematics teaching, Metaphor, Teacher candidates.

### INTRODUCTION

As of December 1, 2019, the Coronavirus (Covid-19) pandemic emerged in the city of Wuhan, the capital of the Hubei region of China, has caused significant changes in many areas such as health, economy, social life and educational practices in the global sense. The pandemic (WHO, 2020) was declared worldwide as of March 11, 2020, has seriously affected the education and training situation. Measures such as house arrest, travel ban, and school closure have put millions of children, young people and adults at risk of encountering inequality of opportunity in terms of education (Giannini & Lewis, 2020). The education of children, youth,

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especially women and girls who have been displaced from their homeland in refugee camps in underdeveloped regions such as Mali, Niger and South Sudan has been severely affected. It is thought that this situation may cause devastating consequences in the future (Giannini & Albrechtsen, 2020). Due to the increased risk of dropping out of school, especially for disadvantaged student groups, distance education should be implemented with all its methods, whether continuous or flexible (UNICEF, 2020). For the continuity of education and training, responsibilities fall on both the government and people, such as teachers, students, parents, who take an active role in the process.

In many countries, digital education was supported and education continued with different technological infrastructures such as live lessons and online courses (Chang & Satako, 2020). In addition, in this process where online and distance education gains importance, governments are establishing cooperation platforms for education. Studies on how the prepared platforms will be used, how they will help the instructor, internet access to/of the platform, and student-learning output tracking are being structured (Atchoarena, 2020). In order to minimize the negative effects of the pandemic and ensure the continuity of education, UNESCO has announced that it will support countries in education (UNESCO, 2020). There is no data on when this situation, which affects around 92% of the student population worldwide, will end completely. In this direction, it can be said that new methods or innovative approaches should be developed (Can, 2020; Gilani, 2020), while it can be said that solution-finding methods and learning quality are parallel to the level and quality of digital access (Gilani, 2020).

Distance Learning is the process in which the student and the instructor can process the curriculum in a planned way, both visual and audio, with the help of both written and electronic communication tools (İşman, 2011). It is providing the ability to think critically, solve problems, work in cooperation, produce, be active and communicate (Anderson, 2020). The advantages of distance education are that it can reach large audiences, individuals with disabilities have the opportunity to learn, independent of time and place, and the opportunity to learn at their own pace. On the other hand, the high investment cost in the first case, the lack of existing technological infrastructure and the inability to operate the system as it should, the problems of updating the system, the difficulties in creating a curriculum and self-discipline can be given as examples of the disadvantages of distance education (Altıparmak et al., 2011). In addition, according to Chang and Satako (2020), the problem of entry to technology-based education, the complete change of exam schedules across the country, the inability to carry out in-unit training as it should, the deprivation of the regular life of the school and the results of asociality are among the bad results of distance education

## **Metaphors**

Metaphor is the art of expressing something in another way (Demirbilek & Korkmaz, 2021; Keklik, 1990), and metaphor can also be defined as the transfer of knowledge from a known area to an unknown area (Soysal & Afacan, 2012). A concept that is intended to be explained with the help of metaphors is tried to be explained with another concept that has a similarity from a different perspective. The created metaphor has more meaning than the sum of its parts (Yaman & Yaman, 2020). The unknowns are associated with the known, and the characteristics of different situations are matched. Thus, new concepts are perceived through analogies. This process is based on the person's formal and informal learning (Aydoğdu, 2008; Geçit & Gençer,

2011). Metaphors, which are conceptual in nature, are shaped by the daily experiences of the person. For this reason, the given metaphors may be inconsistent because the concept system is different and personal. Because the individual structures of the metaphor is created in line with the acquired inferences. Abstract thoughts have a metaphorical and special core and are often unconscious. However, defining these abstract ideas as metaphors can create some deficiencies (Lakoff & Johnson, 2005).

Metaphors can make sense of objective facts and enable events to take on different meanings according to experiences with the help of interpretations. Metaphors draw attention to the similar features between the words that are meant to be told and the words that are told can cause different aspects to be ignored (Morgan, 1998 as cited in Ada, 2013). In metaphors, the person can change the word as he wants to express to some extent. Therefore, metaphors can cause confusion. For this reason, explanatory sentences should be clear and understandable (Duit, 1991). The metaphorical meaning of the word, which is more intense than its literal meaning, carries relative values. It gives some clues about the individual characteristics of the person such as character and culture. In addition, metaphors improve one's ability to think deeply (Booth, 1978).

### **Importance and Purpose of the Study**

It can be said that the serious change in the education system experienced throughout the world during the pandemic process deeply affects the teachers and students. It is very important to know that how teacher candidates are affected by this process. Because it is thought that our teacher candidates' perspectives towards the online education system may affect their future teaching methods and strategies. In order to change the perception of individuals about a subject, first of all, metaphors about this subject must be known because although it is difficult to change perceptions, it is not impossible (Meyer, 2005).

People often have difficulty when asked about their thoughts, perceptions, attitudes or feelings about a topic. However, such questions can be answered more easily with a word. The education specialist, psychologist or trainer can give many ideas about the previous experiences and tendencies of the person through used metaphors. Curriculum changes and its needs, the development of different theories in social sciences, and the existence of developments in educational sciences might be shaped if students' metaphors are understood (Hartzell, 2004; Levassuer, 2004). It is an important step in the education-teaching processes to reveal the thoughts of the students in a concrete way with the help of metaphors. In addition, metaphors make sense of abstract issues and enable the person to analyze himself and his surroundings better (Demirbilek & Korkmaz, 2021).

For that reason, purpose of this study is to determine the perceptions of elementary school mathematics teacher candidates towards distance education with the help of metaphors.

## **METHOD**

### **Research Design**

The analysis of the research was made through qualitative research methods and phenomenology design. The aim of qualitative research methods is to reveal the "meanings" created by individuals and to understand how people comprehend their lives and experiences

(Merriam, 2015). According to Yıldırım and Şimşek (2016), the phenomenology design focus and investigate the concepts that we are aware of but do not have in-depth knowledge of. In summary, it provides the revealing of individual perceptions about a phenomenon by in-depth examination of the data.

### **Study Group**

The study group of the research was determined with convenience sampling, which is one of the sampling methods whose probability is unknown and can be found easily, which serves to purpose of the study (Yıldırım & Şimşek, 2016). The study group consists of 100 volunteer teacher candidates studying at Muş Alparslan University, elementary school mathematics teaching department in the 2020-2021 academic year.

### **Data Collection Tool**

The data collection tool of the research consists of a single question. It was developed by the researcher. In the opinion form, there is an information paragraph about what the metaphor is and the question sentence; “Distance education is like ..... because .....”. The opinion form prepared with google forms and it was sent to the participants with the help of a link. The documents obtained from those who filled out the form in accordance with the principle of voluntarism constituted the main data source of the research.

### **Data Analysis**

In the analysis phase, illogical or lacking explanations about the metaphor were excluded from the data of the study. Then, the pre-service teachers participating in the research were coded as S1, ... , S100 from 1 to 100, respectively. The meanings attributed to the metaphors were transformed into table titles in the form of metaphors for Distant Education (DE), which has a neutral perception as a result of positive, negative and multiple meanings. Then, the categories of metaphors were determined by making content analysis on the data. The categories created were created in line with the meaning attributed to the answers given by the participants to the explanation part. Metaphors with certain common features are grouped under a single category. Then, the frequency and percentages of the use of metaphors were calculated. Direct quotations are included in order to reflect the views and thoughts of the participants in a clear and more striking way (Yıldırım & Şimşek 2016). In this direction, some of the answers given by the pre-service teachers are included in the findings with direct quotations.

### **Reliability Study of Data**

The created categories were analyzed with the help of another expert by consensus to ensure the reliability of the study. For the reliability of the research, the formula developed by Miles and Huberman (1994) was used. ( $\text{Credibility} = \frac{\text{consensus}}{\text{consensus} + \text{disagreement}}$ ). In 90 metaphors, researchers found compatibility, and 10 metaphors showed disagreements. As a result of the discussion, this situation was resolved by consensus. The reliability calculation made in this direction was found to be 0.9. According to Miles and Huberman (1994), if a consensus of 90% or more is achieved between researchers then, the research is considered reliable. Therefore, it can be said that the present study is reliable.

## RESULTS

### Negative Perceptions

It is seen that pre-service teachers created a total of 87 different metaphors. The metaphors with the highest frequency are "Inequality of Opportunity, water, high mountain, bad, dream, prison, useless, not being face to face" is generally (75%) in line with negative perception. Reasons for this are stated as that they do not have the same opportunities, education system evaluates everyone as if they are in the same conditions, and that it is useless, unproductive and abrasive like writing on water. "N" is the number of metaphors, "f" is the frequency and "%" is the percentile shown in Table 1. Descriptive statistics are given in Table 1.

**Table 1.** *Metaphors containing negative perceptions about DE*

| Category            | Metaphors   | N         | f         | %         |
|---------------------|---|-----------|-----------|-----------|
| Insufficient        | (1): A drop in the ocean, Windowless house, Pomegranate, Robotization, Eating without salt, Unripe fruit, Distance, Drinking tea with a mug   | 8         | 8         | 8         |
| Inefficient-Useless | (1): Expired watermelon, Timber, Broken wrist watch, Obese dietitian, Carrying water with a sieve, Abstract Algebra, Father's side, Foreign song, Gum, Cheap perfume, Pleasebo "fake treatment", Turkish lira, Not being face to face, Laziness, Winter in Muş, Watching foreign movies without dubbing and subtitles, Video talk of a large family, Being in a coma, Online training package from the Internet, Wasted water,<br>(2): writing on water<br>(4): Bad<br>(1): water | 23        | 28        | 28        |
| Distance            | (1): To smell a flower through the glass, Not to be able to see and touch it, Temporary whim, Dream, Mirage.  | 5         | 5         | 5         |
| Corrosive           | (1): The rasp of life, Aging fast, A science that is hard to show, Aging, Punishment, Inaccessibility, Darkness, Knots, Searching for treasure, Rainy weather.<br>(2): High mountain, Difficult working environment   | 12        | 14        | 14        |
| Forced              | (1): Walking blindfolded, Chinese vaccine, Night without day, Falling into outer space<br>(2): Prison   | 5         | 6         | 6         |
| Uncertain           | (1): Covid 19, Paradox, Matryoshka  | 3         | 3         | 3         |
| Inequality          | (1): Survival, Breathing, Marathon running, Lame duck, Fruit on high ground, Race of rabbit and turtle<br>(5): Inequality of opportunity  | 7         | 11        | 11        |
| <b>TOTAL</b>        |   | <b>63</b> | <b>75</b> | <b>75</b> |

When Table 1 is examined, it can be said that 75% of the teacher candidates have a negative perception towards DE. As can be seen from the direct quotations given below; among the most important reasons for this situation are the internet shortage, financial impossibilities, inequalities of opportunity, inefficient education, insufficient understanding of the lessons in

the virtual environment, and the responsibilities brought by the system make things even more difficult. With the help of direct quotations, the opinions of the pre-service teachers are given below.

*“Distance education is like a drop in the ocean. Because it corresponds to only one of thousands of drops in the ocean. You want to take advantage of the ocean, but you can only take a drop.” S1*

*“Distance education is like a broken wrist watch. Because you see that the lesson is being taught, there are assignments given, there are exams, but you never feel like you are studying. It exists but does not exist, it appears but does not work, there is no function in the visual.” S5*

*“Distance education is like the fruit on high ground. Only those who are taller (those who have the means) will grow.” S91*

*“Distance education is like eating without salt. Even if it fills, it does not give flavor. There is no intimacy in the real classroom.” S68*

*“Distance education is like getting old fast. When you're 22, age 10 is suddenly getting old and feeling like 32. Because it does nothing but put people under stress.” S10*

*“Distance education is like an obese dietitian. Because it doesn't benefit anyone.” S12*

*“Distance education is like carrying water through a sieve. Because a person thinks he has learned, but he has not learned anything.” S17*

*“Distance education is like smelling a flower through a glass. Because it never gives the feeling of real education.” S21*

*“Distance education is like a prison. Exams are like the family that comes to see you every now and then, it connects you to life and reminds you of the existence of the school. Even if you love, you cannot see.” S84*

*“Distance education is like a father's side. Because there is no benefit, but there is a lot of harm.” S25*

*“Distance education is like a Chinese vaccine. Because while the people who are described as bourgeois have access to safer, useful and effective drugs, it is similar to the vaccine that the poor are forced to use and have no other alternative.” S28*

*“Distance education is like a high mountain, it is very difficult and tiring to reach the top.” S20*

*“Distance education is like an expired watermelon. It looks beautiful from the outside and is empty inside.” S36*

*“Distance education is like placebo. You think it is useful, but in fact it is of no use.” S43*

*“Distance education is like Turkish Lira. Its value is decreasing day by day.” S46*

*“Distance education is like bad. It reduces the efficiency of the lesson.” S58*

*“Distance education is like inequality of opportunity. Because everyone acts as if they are in equal conditions without questioning the negative conditions of the person and without finding a solution.” S63*

*“Distance education is like laziness, it accustoms one to the easy. Because there is no point in trying.” S54*

*“Distance education is like the winter of Muş. Because even on a sunny day, you don't get warm.” S55*

*“Distance education is like Covid-19. Because it is not clear what the effects will be in the future.” S60*

*“Distance education is like breathing. Because, like education, we can breathe in line with the possibilities. If you do not have the opportunity, you have no right to live” S72*

### **Positive Perceptions**

On the other hand, it is seen that there are teacher candidates who see distance education as an opportunity, benefactor or privilege. "N" is the number of metaphors, "f" is the frequency and "%" is the percentile shown in Table 2.

**Table 2.** *Metaphors Containing Positive Perceptions for DE*

| <b>Category</b> | <b>Metaphors</b>  | <b>N</b>  | <b>f</b>  | <b>%</b>  |
|-----------------|---|-----------|-----------|-----------|
| Ease            | (1): Teleport Machine, Freedom, Cheating, Privilege, Benevolent<br>(2): Opportunity | 6         | 7         | 7         |
| Savior          | (1): Ambulance, Light, Lantern, Moving the Class Out of School, Fennel Tea          | 5         | 5         | 5         |
| Development     | (1): The Modern School of the Future, The Novel, A Necessity                        | 3         | 3         | 3         |
| <b>TOTAL</b>    |   | <b>14</b> | <b>15</b> | <b>15</b> |

When Table 2 is examined, it can be said that 15% of the teacher candidates have a positive perception towards online education. It is seen that the category with the highest percentage (7%) is convenience (ease), and distance education is perceived as an opportunity in this process. As can be seen from the direct quotations given below; Distance education in this part, which includes 15% of the teacher candidates participating in the research; It has been described as a guiding light, comfort, result of development and a privilege. In this direction, the opinions of the pre-service teachers are given below with the help of one-to-one quotations.

*“Distance education is like a teleportation machine. Lessons and teachers come to where you are in an instant.” S3*

*“Distance education is like an opportunity. Because time savings are at a high level.” S16*

*“Distance education is like an ambulance. Because he saved our lives by catching up with us just when we were saying that the connection with the school was lost.” S19*

*“Distance education is the modern school of the future. Because developing technology will change our education life.” S30*

*“Distance education is like a compulsory need. The student adjusts and evaluates learning at his/her own pace.” S59*

*“Distance education is like fennel tea. You don't like the taste at all, but you have to drink to heal.” S56*

### Neutral Perceptions

"N" is the number of metaphors, "f" is the frequency and "%" is the percentile shown in Table 3.

**Table 3.** *Metaphors containing neutral perception about DE*

| Category            | Metaphors  | N  | f  | %100 |
|---------------------|--|----|----|------|
| Contain variability | Game of Chance, Winter Season, Wall Clock, Oltu Stone, Balance Board, Black and White Photography, Fenerbahce, Hourglass, Surprise Egg, School Without Rules | 10 | 10 | 10   |

When Table 3 is examined, it is seen that 10% of the teacher candidates participating in the research have an neutral perception towards distance education. Therefore, they stated that distance education varies from person to person. Below are metaphorical sentences showing that this process can be good or bad, if possible.

*“Distance education is like a game of chance. Because it is a question that the faculty member who can carry out distance education cannot manage this process as well as manage it well.” S8*

*“Distance education is like the winter season. Only those who are in poor condition suffer from the cold of winter, and those who are in good condition enjoy themselves.” S9*

*“Distance education is like the weight on the balance board. Because no matter how much our esteemed trainers support us, the home environment and external factors affect the process. On one end of the balance board is weight (distance education) and at the other end is the student's patience, self-belief, ambition, desire and determination to work. If the balance is disturbed due to these emotional movements on the part of the person, the distance education process will fail.” S27*

*“Distance education is like a wall clock. It is said that it is not taken care of, even if it is not, it will happen. But if there is no wristwatch or phone around, it becomes indispensable for people.” S15*

*“Distance education is like a black and white photograph. It has as many blacks as its difficulties and as many whites as its benefits.” S34*

*“Distance education is like Fenerbahce because it always goes out for a championship. Winning with small teams, that is, against small problems; when a big team encounters big problems, it is defeated.” S69*

### CONCLUSION and DISCUSSION

From the findings obtained in the research, it was seen that 100 pre-service teachers created a total of 87 different metaphors. It is seen that 75% of teacher candidates have a negative perception towards distance education. In addition, it is seen that 15% of the teacher candidates have a positive perception and create metaphors in this direction. 10% of teacher candidates also argued that distance education can cause situations that vary according to the situation of the person.

It can be said that the protracted pandemic period affects the educational conditions and processes negatively. In the study of Kantos (2020), which is in line with the findings of this



research, it was determined that the teacher candidates found distance education insufficient. Disadvantages of distance education are stated as inadequacies, negative attitudes (Barış 2015; Gürer et al., 2016), boring, non-interactive, inefficient lessons (Altun-Ekiz, 2020; Kaleli-Yılmaz & Güven, 2015), insufficient learning, limited interaction and feedback, technical problems (Baş et al., 2022). In addition, Genç, Engin, and Yardim (2020) stated that lessons are piled up at certain times and accumulated workload. Inability to control external stimuli (noise), insufficient understanding of instructional tasks, overexposure to technology, health problems, personal differences (inadequacies), internet or technological impossibilities, students' bad presentations in the course content, method-strategy limitations (Özyürek et al., 2016) are also among the disadvantages.

The online education system works slowly, the system causes problems when loading homework, the university's lack of technical support, free 6 GB mobile data packages provided by higher education council is not sufficient (Demirbilek, 2020). In addition, difficulties in understanding the subjects in applied lessons, inequalities of opportunity among students, inability to manage their time well and loss of interest in the lesson were determined as frequently encountered obstacles (Kırtak-Ad, 2020). Additionally, the decrease in attendance (Erol-Şahin, 2019), the lack of control in the exams (Özyürek et al., 2016), the negative attitude due to technical and systematic problems Gillies (2008) discredits the courses. Kaleli-Yılmaz and Güven (2015) mentioned that pre-service teachers have difficulties in communicating with extracurricular faculty members and that technical problems cause a negative perception towards distance education.

Individuals who do not have the opportunity to participate in face-to-face education can obtain the right to education, ensure the independence of time and space, and have enthusiasm for distance education (Altun-Ekiz, 2020; Hannay & Newvine, 2006; Karakaş & Doğan, 2017; Kırık, 2014; Kırtak-Ad, 2020; Özbek, 2014; Özyürek et al., 2016; Paydar & Doğan, 2019; Salar, 2013; Süral, 2008). In addition, studies have shown that distance education eliminates physical preparation for lessons, provides easy access to course registration and materials, accelerates communication with instructors (Genç et al., 2020). Online exams can provide faster feedback, reduces the stress of students in exams, and supports academic staff. It has been stated that the university's attitudes and competencies increase the efficiency of the course in terms of fast adaptation to distance education, being economical in terms of time-money-labor, preparing the students for the lesson, easy access to the given feedback and resources, and providing the opportunity to participate in online trainings remotely (Şeren et al., 2020). Canpolat and Canpolat (2020) stated that the biggest factor for the students in finding distance education applications sufficient and appropriate is those who carry out the process willingly and show self-sacrifice.

The suggestions presented in the studies to overcome disadvantages of distance education and its deficiencies, support the data revealed by this study. Accordingly, it has been suggested that the lessons should be live and interactive and, the system should be cleared of technical problems in order to have a positive perception of students towards distance education (Altun-Ekiz, 2020). In addition, different suggestions were presented, such as the need to blend face-to-face education with distance education (Özkul & Aydın, 2012), and the summer school application for distance education (Özgül & Uysal, 2016) may provide increase in efficiency of distant education in the long term by accustoming both students and teachers.

## Suggestions

In order to eliminate the negative perceptions of students, and increase the effectiveness of distance education with applications including virtual reality, the school or course environment can be loaded onto the DE system, allowing students to feel themselves in the classroom materials. As for another example, the course records of the lecturers can be recorded onto the DE and students can access them in three dimensions or in the form of holograms.

Institutions should take the necessary measures so that distance education does not differ from person to person, which is another important point emphasized by students. For example, students who do not have distance education opportunities, individualized DE offices can be established in all educational institutions and libraries to allow these students to use.

**Ethics Committee Permission:** Ethics committee approval for this study was obtained with the decision of Muş Alparslan University Scientific Research and Publication Ethics Committee dated 06/04/2021 and numbered 23.

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