

Examining the perceptions of primary school students about information and communication technologies in the distance education process during the COVID-19 pandemic via pictures

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Abstract

The aim of this study is to examine the perceptions of primary school students about information and communication technologies in the distance education process during COVID-19 pandemic via the pictures they drew. For the sample group of the study which was conducted according to the qualitative research method and phenomenological design, the convenience sampling method was used. A total of 43 students were included in the study. In the study, the data were collected using the draw-and-tell technique. In the data analysis, the content analysis was used. As a result of the data analysis, four main themes were specified. In the pictures drawn by the students, the equipment and software they used during this period were collected under the main theme of 'devices and application programs'. While the drawings and views of the students concerning the use of information and communication technologies in the distance education process were included in the main theme of 'education', the effect of technologies on their social life in the process was included in the main theme of 'social life'. Finally, their drawings and views concerning their metaphorical perceptions about information and communication technologies during the process were included in the main theme of metaphors.

Keywords: COVID-19 pandemic; distance education; information and communication technologies; picture; qualitative

Introduction

Information and communication technologies, which are used in many important areas of life such as education, health, commerce and economics, are in the centre of our lives with concepts like educational technologies in the dimension of education. Although education and technology are different concepts, they are used together to increase the quality of learning and teaching environments. Main purpose of both these concepts is to contribute to human development. This contribution mainly concentrates on the formation of effective and permanent learning (İşman, 2008, p. 49). Information and communication technologies are a whole of technical and scientific knowledge automatically allowing for collecting, processing, storing, transmitting and accessing information (Alaca & Yılmaz, 2016, p. 512). Together with the utilisation of information and communication technologies in education, both teaching methods and applications and content and assessment processes have developed (Yılmaz, Töre-Başat & Özer, 2020).

When the COVID-19 virus rapidly spread in the early 2020, the World Health Organisation declared it as a pandemic. The COVID-19 pandemic and intervention measures have significantly altered the usual processes of the living space worldwide (Salakhova, Shamsitdinova & Shakhakimova, 2020). Together with the onset of distance education after terminating face-to-face education due to the pandemic, the importance of information and communication technologies and the necessity for students to have the skill of effectively and safely accessing and using the technology to achieve their educational goals have emerged. There are three basic topic titles regarding this necessity. The first one is how to provide an adequate digital access and the quality of that access. Attention should be paid to whether all students have their own devices (computer, tablet, telephone) and whether these devices have minimum technical properties and adequate internet connection. The second topic title is how to support students and their families concerning technology at home. It is possible for students without digital access at home to have fewer digital skills than their peers. Therefore, students and

their families need support to safely and effectively surf on the internet. The third topic title is to have a durable distance education plan (Williamson, Eynon & Potter, 2020, p. 110).

The effect of information and communication technologies on distance education is crucial. Effectiveness of distance education depends on how well-developed information and communication technologies are and how well people can utilise the opportunities of information technologies (Salakhova, Shamsitdinova & Shakhakimova, 2020). In the distance education process, students have the opportunity of having a good command of the educational content with the help of modern information and communication technologies (Machynska & Dzikovska, 2020). Even if the pandemic is over, distance education applications are now expected to take more space in our lives compared to the past. Therefore, in the distance education process during the pandemic, the views, experiences and perceptions of students from all grades concerning the process have become an important issue. In this study, it was aimed to examine the perceptions of primary school students about distance education process during the COVID-19 pandemic via the pictures they drew.

1. Research Methods

1.1. Research Design

The study which was prepared according to the qualitative research method was carried out according to the phenomenological design. Since all concrete and abstract experiences are created by consciousness, the main research area of phenomenology is description of the essence of consciousness (Sönmez & Alacapınar, 2014, p. 88). Phenomenology addresses reality only in an individual dimension and grounds on a perspective including personal experiences. In phenomenological research, experiences are examined from all angles and it is tried to reach the essence of experiences. It is because it suggests that experiences shape behaviours (Büyüköztürk, Kılıç-Çakmak, Akgün, Karadeniz & Demirel, 2012, p. 20; Ersoy, 2016, pp. 54–56). In this direction, the phenomenology design was used in the research to reach the essence of the distance education experiences of primary school students during the COVID-19 pandemic process and to explain these experiences by examining them.

1.2. Participants

The sample group was determined according to the convenience sampling method. In this method, the researcher chooses the people and groups from whom/which he/she can easily collect the data (Sönmez & Alacapınar, 2014, p. 142). Accordingly, a total of 43 primary school students (28 girls and 15 boys) studying in the city centre of Elazığ were included in the study. In Table 1 is presented information about the students.

Table 1. Information of the sample group

Grade	Gender	
	Girls	Boys
Grade 1	10	4
Grade 2	4	1
Grade 3	4	2
Grade 4	5	3
Grade 5	5	5
Total	28	15

Of the participants included in the sample group, 14 were grade 1 students, five were grade 2 students, six were grade 3 students, eight were grade 4 students and 10 were grade 5 students.

1.3. Data Collection Tools

The phenomenological interview process is a communication and interaction process. In phenomenological studies carried out with young participants, painting can be done in order to reveal the meanings of the participants about a certain phenomenon. Thus, it is possible for children to concretise their thoughts through the pictures they draw (Ersoy, 2016, pp. 83–91). For this reason, the draw-and-tell technique was used while collecting the data of the research. Draw-and-tell technique, which is a child-centred practice, is a self-reported approach directed by children. Unlike most apps for kids,

the opportunity to draw is usually fun. The availability of different sized papers and coloured and various types of pencils gives children a sense of power and control (Driessnack, 2006, pp. 1418–1427). It is a technique that should be used carefully and sensitively in order for children to be active participants in revealing their world as they see it (Horstman, Aldiss, Richardson & Gibson, 2008, p. 1001).

The researcher conducted one-on-one interviews with each student. In these meetings, firstly, a little information was given about information and communication technologies and what these technologies were was discussed. Then, they were asked to draw a picture concerning what they thought about information and communication technologies in the distance education process during COVID-19 pandemic. The students drew their pictures in a relaxed and active manner. Afterwards, the students were asked to describe the pictures they drew. Each student expressed their views on the picture they drew. The students' views on the pictures they drew were carefully listened to and recorded.

1.4. Data Analysis

In the research, analyses were conducted about the students' own drawings. Individual papers are reliable sources of data on a person's attitudes, beliefs and worldviews. However, since these documents are individual documents, they reflect the subjective point of view (Merriam, 2015, p. 134). In addition, the lexical meaning of a visual symbol used in pictures and its meaning in the culture to which it belongs should be examined because symbols, images and signs have meanings according to the culture and time they belong to. First, it should be determined what the shape expresses, and then what values and thoughts it carries (Sönmez & Alacapınar, 2014, p. 97).

For this reason, attention should be paid to ensuring the validity and reliability of these documents. For validity in qualitative research, the researcher should first make the participants feel comfortable and ensure their active participation in the process (Kuş, 2012, p. 125; Merriam, 2015, p. 102). Afterwards, the researcher should act impartially and continue the research away from prejudices. In addition, the validity of the research depends on the generalisability of the results. In qualitative research, the better the data, categories, analyses and patterns, in short, if each of the stages are defined, the easier it will be for other researchers to understand the results and carry out similar studies in other environments (Büyüköztürk et al., 2012, p. 246).

Reliability in qualitative research is the recording of everything that happens in the working environment as data by the researchers, their examination, quoting from the participants and giving the quotations as they are without additions. In addition, the detailed description of each stage of the research also increases reliability (Büyüköztürk et al., 2012, p. 245). The validity and reliability of a study are highly dependent on the ethical behaviour of the researcher because ensuring that a research is conducted with a certain integrity and honesty includes the ethical stance of the researcher. Ethical behaviours in qualitative research determine to what extent the researcher reveals the main purposes of the study, how knowledgeable and willing the participants are to take part in the research and to what extent the privacy of individuals' private lives is respected and they are tried to be protected from possible harm (Merriam, 2015, pp. 220–222).

In order to meet the validity, reliability and ethical behaviours in the research, the students were first informed about the research and included in the research within the framework of voluntariness. The students' opinions were listened carefully, recorded and analysed in accordance with the content analysis. Student names and private information were kept confidential, and students' views were included in the research findings as direct quotations.

Content analysis is used to analyse both texts and visuals such as student pictures (Büyüköztürk et al., 2012, p. 240). Data analysis includes the stages of exporting the meaning of the data, combining what people say, what the researcher sees and understands, reducing and interpreting (Merriam, 2015, p. 167). Content analysis primarily requires examining the content of data. The process covers coding data and creating categories. Data are categorised and the correlation between them is determined (Sönmez & Alacapınar, 2014, p. 245; Merriam, 2015, p. 196). During determination of categories, the dimensions of the subject should be defined as clearly as possible. Categories should be clear so that different researchers can achieve the same results when examining the same material (Büyüköztürk et al., 2012, p. 242).

In this direction, the data obtained from the interviews with the students were carefully examined and the coding process was carried out. The obtained codes were categorised in a systematic way. The determined codes and the created categories were re-examined and placed under appropriate themes. While creating the themes, attention was paid to keep the codes and categories under one roof and to be understandable.

2. Findings

In the study, data related to the pictures drawn by the students concerning information and communication technologies in the distance education process during the pandemic and their expressions were analysed and four main themes were specified. The main theme of 'devices and application programs' was determined regarding the coding of the technical devices and software used by the students in their distance education experiences. The main theme of 'education' was determined regarding the coding of students for using information and communication technologies in the distance education process and at the point of access to information. The main theme of 'social life' was determined regarding the coding of the positive and negative effects of the information and communication technologies used by the students in the distance education process on their social lives. And finally, the main theme of metaphors was determined regarding

the coding of the information and communication technologies that students use very often in their distance education experiences by comparing them to other concepts that exist in their minds.

2.1 Devices and Applications

In the study, the codings related to the equipment and software used by the students in their drawings during this process were included in the main theme of devices and application programs. This main theme was divided into two subthemes as devices and application programs within itself. Table 2 shows the codings and frequency information related to the subthemes.

Table 2. Information about the main theme of devices and application programs

Subthemes	Frequency
Devices	54
• Computer	19
• Telephone	15
• Tablet	5
• Robot	5
• Camera	2
• Television	2
• Missile/rocket	2
• Space shuttle	2
• Earphone	1
• Drone	1
Application programs	43
• Youtube	13
• Google	6
• Eba TV	5
• Zoom	4
• Facebook	3
• Tiktok	2
• Music listening	2
• Instagram	2
• WhatsApp	2
• Calculator	1
• Translation application	1
• Play Store	1
• Applications for the disabled	1
Total	97

When examining Table 2, 10 different codings emerged in the subtheme of Devices as ‘computer’, ‘telephone’, ‘tablet’, ‘robot’, ‘camera’, ‘television’, ‘missile/rocket’, ‘drone’, ‘earphone’ and ‘space shuttle’ in the pictures drawn by the students concerning information and communication technologies in the distance education process during the pandemic and their expressions. The subtheme of Application Programs had 13 codings as ‘Youtube’, ‘Google’, ‘Eba TV’, ‘Zoom’, ‘Facebook’, ‘Tiktok’, ‘music listening’, ‘Instagram’, ‘WhatsApp’, ‘calculator’, ‘translation application’, ‘Play Store’ and ‘applications for the disabled’. Figure 1 shows sample student pictures and views referring to the codings in both subthemes.



Fig. 1. Sample pictures related to the main theme of devices and application programs

Figure 1 shows sample student pictures concerning the devices and application programs used. Regarding the applications they used, one of the students in the study stated, *'I always use my phone to listen to classes on Eba'*, while another student stated, *'I use Youtube to watch cartoons, Tiktok to watch fun videos and Play Store to download games'*. Another student interpreted his/her picture as, *'I use the tablet with giant eyes so often. Also people can now go on a holiday in space via space shuttles and missiles'*.

2.2 Education

In the study, the codings related to the pictures drawn by the students concerning the use of information and communication technologies in the distance education process and their expressions were included in the main theme of education. The main theme of education was divided into three subthemes as connection, class and access to information. Table 3 shows the codings and frequency information related to these subthemes.

Table 3. Information about the main theme of education

Subthemes	Frequency
Connection	27
• Internet	20
• Reception	5
• Battery	2
Class	21
• Video class	8
• Live class	7
• Homework	2
• Educational game/video	3
• Family activity	1
Access to information	8
• Research	3
• Easy	3
• Instantaneous	1
• Limitless	1
Total	56

When examining Table 3, three codings ('internet', 'reception' and 'battery') emerged in the subtheme of connection concerning the pictures drawn by the students about the use of information and communication technologies in the distance education process and their expressions. In the subtheme of class, five codings were specified as 'video class', 'live class', 'homework', 'educational game/video' and 'family activity'. Finally, the subtheme of access to information included four codings as 'research', 'easy', 'instantaneous' and 'limitless'. Figure 2 shows the sample student pictures and views referring to the codings in each subtheme.



Fig. 2. Sample pictures related to the main theme of education

Figure 2 shows sample student pictures concerning the main theme of education. Regarding their drawings, one of the students in the study stated, '*It is so important for me to have my computer plugged in for full battery and have internet connection*', while another student stated, '*Never-ending internet with full reception everywhere and access to limitless information*'. One student explained his/her drawing by expressing the class and family activity codings as, '*We are able to conduct our classes by connecting to live classes via Zoom*', while another student stated, '*I participate in the classes at home in the morning and do my homework with the help of my mother and my sister in the afternoon*'.

2.3 Social life

In the study, the codings related to the pictures drawn by the students concerning the effect of information and communication technologies on their social life during this process and their expressions were included in the main theme of social life. This main theme had two subthemes as positive impacts and negative impacts. Table 4 shows the codings and frequency information related to these subthemes.

Table 4. Information about the main theme of social life

Subthemes	Frequency
Positive effects	56
• Fun (game/video/cartoon)	27
– Game	14
– Cartoon	7
– Video	6
• Communication (voice/video/texting)	10
– Video call	7
– Texting	2
– Voice call	1
• Being safe at home	6
• Colouring up life	4

• Removing the distances	2
• Socialising	2
• Remote access/control	2
• Self-control	2
• Making life easier	1
Negative effects	21
• Inability to discern the virtual from the reality	7
• Power of advertising/shopping	4
• Asociality	3
• Addiction	3
• Worsening of the health	3
• Loss of time	1
Total	77

When examining Table 4, nine codings were involved in the subtheme of positive effects as ‘fun’, ‘communication’, ‘being safe at home’, ‘colouring up life’, ‘removing the distances’, ‘socialising’, ‘remote access/control’, ‘self-control’ and ‘making life easier’ concerning the pictures drawn by the students about the effect of information and communication technologies on their social life during this process and their expressions. In the subtheme of negative effects, six codings were specified as ‘inability to discern the virtual from the reality’, ‘power of advertising/shopping’, ‘asociality’, ‘addiction’, ‘worsening of the health’ and ‘loss of time’. Figure 3 shows the sample student pictures and views referring to the codings in these subthemes.



Fig. 3. Sample pictures related to the main theme of social life

Figure 3 shows sample student pictures concerning the main theme of social life. One student stressed in his/her drawing that he/she had self-control concerning information and communication technologies and these technologies allowed him/her to be safe at home during the pandemic; however, excessive use of them was harmful to health as follows: *‘The internet should not invade our lives. Our eyesight may deteriorate. We should play with our family and friends. We should read. We should watch TV. We can’t go to school because of coronavirus. But we have our classes via the internet safely at home’*. Another student stressed the communication coding in his/her drawing as follows: *‘When I miss my father who lives abroad, I can immediately be with him via video call’*. In the context of negative views, one student expressed the inability to discern the virtual from the reality and shopping codings as follows: *‘When I do online shopping, I want to give the card directly through the computer and buy the things I like through the screen’*. Another student stressed the asociality coding in his/her drawing as follows: *‘My cousin always watches videos on the computer. He/she will immediately cry when we play because he/she wants the computer and telephone. So I play with my other cousin. Technology is a bad thing’*.

2.4 Metaphors

Finally, the codings related to the pictures drawn by the students concerning the metaphors they developed for information and communication technologies in the distance education process during the pandemic and their expressions were included in the main theme of metaphors in the study. This main theme had two subthemes as positive metaphors and negative metaphors. Table 5 shows the codings and frequency information related to these subthemes.

Table 5. Information about the main theme of metaphors

Subthemes	Frequency
Positive metaphors	31
• Happiness	9
• Robot	4
• Flying car	3
• Missile/rocket	2
• School	2
• World	2
• Space shuttle/aliens	2
• Butterfly	1
• Teacher	1
• Friend	1
• Library	1
• Teleportation	1
• Bridge	1
• Virtual vitamin	1
Negative metaphors	5
• Unhappy mother	2
• Sandglass	1
• Mountain	1
• Robot	1
Total	36

When examining Table 5, 14 codings were included in the subtheme of positive metaphors as ‘happiness’, ‘robot’, ‘flying car’, ‘missile/rocket’, ‘school’, ‘world’, ‘space shuttle/aliens’, ‘butterfly’, ‘teacher’, ‘friend’, ‘library’, ‘teleportation’, ‘bridge’ and ‘virtual vitamin’ in the pictures drawn by the students concerning the metaphors they developed for information and communication technologies in the distance education process during the pandemic and their expressions. The subtheme of negative metaphors included four codings as ‘unhappy mother’, ‘sandglass’, ‘mountain’ and ‘robot’. Figure 4 shows sample student pictures and views referring to the codings in both subthemes.



Fig. 4. Sample pictures related to the main theme of metaphors

Figure 4 shows sample student pictures concerning the main theme of metaphors. Regarding positive metaphors, one student interpreted his/her drawing as, *'I think the internet is like a bridge. Because it has provided a connection between home and school for us during the pandemic'*, while another student stated, *'I think the internet is like a flying car. We can access anything anytime'*. Regarding negative metaphors, one student interpreted his/her drawing as, *'In the pandemic we have had our classes online. But in my village there is no internet. We barely have a reception. I climb up high places so that I can get a reception. Therefore I think the internet and technology are like a mountain'*, while another student stated, *'Technology is like a sandglass. Since we always play with our telephones, we don't realise how we waste time and how fast the time flies'*.

3. Discussion

In the study which was conducted to determine the perceptions of primary school students about information and communication technologies in the distance education process during the pandemic via the pictures they drew, the drawings of the students and their views on these drawings were examined and four main themes emerged. The first theme was devices and application programs used by the students. In their drawings, the students mainly stressed devices such as computer, telephone and tablet and programs such as Youtube, Google, Eba TV and Zoom. Together with distance education and lockdown during the pandemic, children's relationship with information and communication technologies has increased even further. Koeze and Popper (2020) stated that the use of application programs such as Youtube, Google Pro, Facebook and Zoom increased during the COVID-19 pandemic. Similarly, in the Fiş-Erümit (2020) research, it was concluded that EBA TV was positively evaluated by students because it supports the learning of primary school students in Turkey.

Concerning the main theme of education, it was revealed that the students stressed connection, class and access to information. In their drawings, the students expressed their problems and expectations related to the subjects of internet, reception and battery. Similarly, Sezgin and Fırat (2020) stated that while city dwellers benefitted from a higher wideband internet in the distance education process during the pandemic, the rural population had a slower internet speed and reception. Also, in the study, the students stressed both live class and video class and homework applications in their drawings. Finally, they indicated that information and communication technologies allowed them to easily conduct studies by means of easy, instant and limitless access to information. The views of the students in the main theme of education emerged in line with their positive and negative experiences concerning information and communication technologies during the pandemic. Likewise, in the study by Alvarez (2020), it was concluded that students face disadvantageous situations in the distance education process such as weak or no internet access, financial constraints, lack of technological devices and emotional support.

Also, the students expressed the positive and negative effects of information and communication technologies on their social life during the pandemic. Regarding the positive effects, they stressed in their drawings that they had fun and their lives coloured up owing to virtual games, cartoons and videos; there were no more distances and they were able to socialise because they were both safe at home and videocalled their teachers, friends and relatives during the lockdown; life had become easier with remote access owing to the technology and they were able to control their use of technology. Regarding the negative effects, the students stressed in their drawings that they were unable to discern the virtual world from the reality in course of time, they wanted to buy the toys because of the advertisements on the videos they watched, the technology took the place of their friends in the course of time and affected their health negatively and they lost time. According to a survey by the Turkish Statistical Institute (2020) on the use of household information technologies, there was an increase in the rate of internet use, internet access from home and online shopping in 2020 when the pandemic broke out. It is a clear situation that the rate of using information and communication technologies has increased during the pandemic, distance education and lockdown process and this has affected the social life from a number of positive-negative aspects.

Finally, the students used specific metaphors in their drawings concerning information and communication technologies. In the positive context, the metaphors of happiness, robot, flying car, missile/rocket, school, world, space shuttle/aliens, butterfly, teacher, friend, library, teleportation, bridge and virtual vitamin emerged. In the negative context, the metaphors of unhappy mother, sandglass, mountain and robot were stressed. Similarly, concerning the use of technology in education by students, Kan ve Pullu (2021) determined that they developed the metaphors of library, teacher and space. Kan and Özmen (2021) found in their study that students used the metaphors of vitamin, world, mother, bridge and robot concerning the distance education process during the COVID-19 pandemic.

Conclusion and Suggestions

As a result of the research, it was determined that the students emphasised the computer, phone, tablet, camera, television and headset devices that they attended online and offline classes as a result of their experiences with information and communication technologies during the COVID-19 pandemic distance education process. In addition, it was determined that students also expressed robot, missile/rocket, space shuttle and drone devices in this process in line with social media and news. It was concluded that apart from the hardware units, the software they use for accessing the lecture videos and social media was also emphasised.

In the process, students emphasised technical features such as internet quota, gravitational power of the hardware units they use and charging. In addition, they stated their experiences in hardware and software units, synchronous and asyn-

chronous courses and access to information. They expressed their positive and negative experiences not only in the context of the lesson, but also in social life. Finally, the students explained the information and communication technologies that they frequently used in this process by comparing them to other concepts that existed in their minds.

As a result of the study, the students stressed both education and social life in their drawings concerning information and communication technologies in the distance education process during the pandemic. It was determined that the students had both positive and negative perceptions during the process. Studies can be carried out to determine the reasons for negative opinions. The study was carried out only with primary school students. The sample group can be extended by including high school and university students. Also, the present study was conducted via the draw-and-tell method. It is possible to obtain more comprehensive results using different activities and data collection tools. In the face-to-face education process, the students can be made draw pictures again and changes within the process can be observed.

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