

## **Technological Problems That Teachers Encountered in Online Education during Covid-19 Process: Stirling Schools Sample**

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**Abstract:** Online education, which passed during the Covid-19 period, has brought along a number of problems. Especially since some of the teachers were children of the pre-millennium and post-millennium era, when the problem of computer literacy was on the agenda, it brought the problem to a different dimension for the generations in which these teachers grew up. In this study, a sample was taken from these teachers and a Likert scale questionnaire was applied to them. In this survey, questions were asked starting from how the computer literacy problem was reflected on them. The problems they experience in online education and how ready the education system is for online education were evaluated through the opinions of teachers.

**Keywords:** Covid-19, computer literacy Online Education, Technological Problems

### **1. Introduction**

While the Covid-19 process caused many problems all over the world, it also produced problems for the education sector. One of these problems was the sudden transition to online education and the fact that some teachers, as well as the education content and curriculum, were not yet ready for this new situation. In this case, as online education continued, many previously invisible problems emerged and added a new dimension to online education discussions, which have been on the agenda for a long time. Here, some aspects of technological problems for online education will be discussed.

#### **1.1 Online Education**

The idea of online education first emerged in the form of distance education in historical development and it was invented to eliminate some negative situations (Aksu & Canturk, 2015). In the case where everyone cannot receive education under equal conditions, the understanding of spreading education to the whole society, which is one of the most important motivation tools of the enlightenment era, brought along new searches (Edwards, 2002). In this context, distance education in the form of correspondence started in order to solve the education problem of the masses where there were inequalities of opportunity. With the

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development of technology, education was given by broadcasting by means of television and radio (Rasheed, 2007). Finally, with the information technologies revolution, which started before the new millennium, the idea of computer-mediated education emerged. After this point, distance education also started to be named as online education (Casey, 2008).

The difficulties experienced in the previous periods of distance education have disappeared with the development of computer technologies and information transfer has accelerated. New technologies have allowed computer-assisted online education, and the developing technology has offered many innovations to the field of education. With the completion of the technological infrastructure, interaction and teamwork that were not possible in distance education models in previous periods became possible (Simpson & Anderson, 2012).

Online education, which emerged as an alternative to face-to-face education, was used especially for the purpose of eliminating some inequalities of opportunity. This training model has become more popular and widely used with the increase in the data transfer speed of the internet to meet the needs. It is possible to define online education as education conducted over the internet in a way that allows teacher-student relationship. One of the important points that makes online education different from distance education in previous generations is that it enables teacher-student interaction (Anderson & Dron, 2012).

Online education has some advantages in relation to face-to-face formal education.

- Everyone can take online education wherever and whenever they want. There is no time and place restrictions as in face-to-face education.
- Since online education can be taken at home, it is possible to receive education in more comfortable conditions.
- In the asynchronous part of online education, it is possible to take this education from anywhere at any time because the training materials are pre-loaded on the internet.
- In online education, the time spent especially for transportation in face-to-face education is saved.
- One of the important aspects of online education is that it provides interaction between teacher and student. This opportunity, which was not provided by distance education in previous generations, was given only in face-to-face education. However, online education enables teacher-student and student-student interaction.
- Unlike face-to-face education, it is possible to watch the lessons again in case of missed lessons.
- It provides education opportunities in all required fields.
- There is no problem in transporting course equipment and materials as in face-to-face education (Alshamrani, 2019).

However, although online education has some advantages over face-to-face education, we encounter other problems in this regard. Although the technological infrastructure and data transfer are suitable for online education, it is not possible to say that the education and its content have been fully adapted to online education (Mallillin et al., 2020). First of all, teachers need to be trained in this regard (Whalen, 2020). While making the curriculum suitable for online education is a problem, preparing the materials is a separate problem (Muhammad et al., 2016).

In addition, although online education allows interaction, it is not as successful as face-to-face education (Celik et al., 2022). Especially the needs of young people to socialize with their friends and environment cannot be met in online education. This is an important disadvantage of online education (Harjule et al., 2021).

## **1.2 Computer Literacy**

Computer literacy has taken its place in the literature as an important problem after the information technologies revolution that emerged around the beginning of the millennium. Computer literacy defines the knowledge and ability to use the computer and its programs. In the period when computer technologies started to become widespread, we can state that computer programs had a very complex structure for people. In addition, problems such as using the internet and accessing the information emerged. Many subjects, from computer shortcut keys to the details of the programs and the use of the internet, are covered in this context. Since people did not encounter such complex technologies in previous periods, it took time for people to adapt to it. This problem, which emerged in computer users in this period, was expressed with the term computer literacy (Cole & Kelsey, 2004).

While considering computer literacy, different criteria were determined. The first of these are basic skills. This is defined as knowing the basic parts of the computer and the functions of these parts. In addition, basic operations such as knowing the operations to be performed using a computer, preparing files, saving and closing are classified under this title. The second criterion was expressed as computer awareness. Accordingly, knowing what the computer can do and what it cannot do is put under this heading. The third is practical skills and is defined as using basic programs such as Microsoft Office. The fourth is described as internet use skills (Wallace & Clariana, 2005).

We can say that the computer literacy problem continues today. Although computers have been actively in human life for the last 10 years, we can still talk about the existence of those who have computer literacy problems. Although there are no problems with the basic skills required in the use of the computer, problems arise in advanced applications. Especially middle-aged and older people experience this problem (Schmidt-Hertha & Strobel-Dümer, 2014).

## **1.3 Digital Natives**

While the previous generation had to deal with computer literacy problems, the definition of the next generation as digital natives is an interesting situation that emerging technologies have come up with. Since children born after the millennium live with computer and internet technologies in every period of their lives, they are called digital natives (Creighton, 2018).

## **1.4 Technology Integration into Education**

Although previous generations had problems in adapting to computer technologies, it should be stated that almost everything in the lives of new generations is based on computers and the internet. Computer technologies, which have already entered all areas of life, have the potential to transform education systems. Another issue that needs to be addressed at this point is the completion of technology integration into education.

The purpose of technology integration, which means the effective use of technology in education, can be defined as speeding up or facilitating the learning process. At this point, it is possible to divide the technology to be used in the field of education into two. The first of these is instructional technologies, and the second is learning technologies. Instructional Technology is technologies that teachers use to teach students, while learning technologies are technologies that students use to achieve a specific learning objective (Huang et al., 2019; Yildiz, 2021; Celik, 2022).

Since computer technologies are an integral part of human life, it should be taught from childhood. To achieve this goal, these technologies need to be integrated into children's education as early as possible. Thus, many innovations will be added to the traditional education style, learning will accelerate, and children's future preparation will be carried out in more suitable conditions (Dorouka et al., 2020).

### **1.5 Teacher Roles**

In traditional education, the teacher was expected to be equipped with some knowledge. The most important of these was determined as “content knowledge”. In this case, the teacher had to know the content of the course in which he specialized. In fact, the basic measure of the quality of the teacher in the traditional understanding of education was content knowledge. “Pedagogical knowledge” was added to this later. What is meant by this concept is that a teacher knows how students will learn a subject. Therefore, knowing not only the content of the subject, but also knowing how to transfer it to the student was the type of knowledge expected from the teacher. Afterwards, “pedagogical content knowledge” was expected from the teacher. Here, the teacher needs to know the content of the pedagogy that develops as a science. Finally, “curricular knowledge” expected from the teacher was added. What is required from the teacher here is to know the curriculum in the field of specialization (Shulman, 1987).

With the development of technology and the integration of many technological innovations into education, the roles expected from the teacher have expanded. In addition to the ones mentioned above, it was expected from the teacher to have "technological content knowledge". At this point, the teacher should know the technology and be aware of how this technology will be applied in his field. In addition, "technological pedagogical knowledge" was added to it. In accordance with this concept, the teacher should know how to teach by using the available technologies in the best way. Finally, the concept defined as "technological pedagogical content knowledge" was introduced. Accordingly, it is expected that the technological content of the expanding science of pedagogy will be known by the teacher (Koehler & Mishra, 2009).

## **2. Methodology**

### **2.1 Research Model**

In order to collect the necessary information to be used in this study, opinions were taken from teachers over the age of 35. The reason for this is that while computer literacy was a major problem when these teachers started their profession or later, the students they address are digital natives. Although technological opportunities are increasing day by day and people have to learn these technologies, it is thought that teachers have problems in the face of new technologies that they needed to use in the suddenly

developing covid-19 conditions. Therefore, it has been tried to reveal what kind of difficulties teachers experienced in online education that developed under these conditions.

## 2.2 Sampling

In this study, teachers over the age of 35 at Stirling Schools operating in the Iraqi Kurdistan region were used. The reason for this is that the computer literacy problem was common when these teachers started their profession. However, the students they address are called digital natives. This sample has been chosen to reveal what kind of problems teachers faced in online education under covid-19 conditions in front of this student profile. In total, 17 teachers answered this questionnaire.

## 2.3 Data Collection

In this study, a questionnaire suitable for the Likert scale was used. Teachers were asked to evaluate the problems they experienced during the online education period through this questionnaire. Afterwards, this questionnaire was evaluated by putting it into statistics.

## 3. Findings

One of the important problems in the period of these teachers when they started their profession just before and after the millennium was computer literacy. We asked the following question in order to determine how valid this situation is for them in the eyes of these teachers.

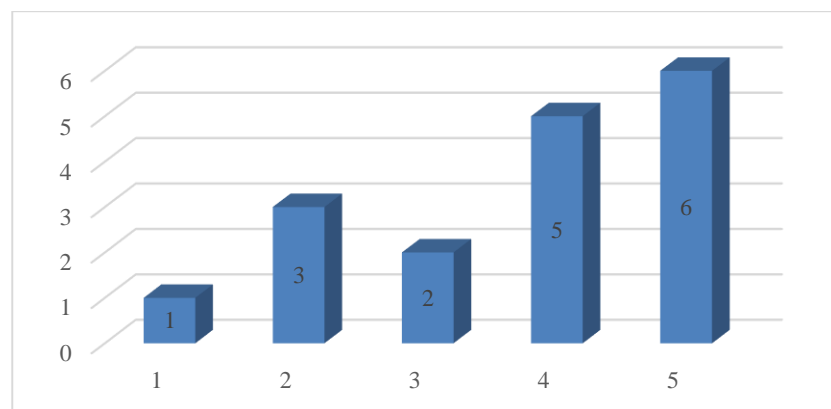


Figure 1: I think I have problems with computer literacy

4 out of 17 teachers (24%) stated that they had problems with computer literacy. 9 of them (53%) thinks that they do not have computer literacy problems. Even though their professional lives were spent in the period when these technologies were used intensively, it is seen that a significant part of the teachers experienced this problem because computer technologies have developed very rapidly in the last two decades.

The sudden transition to online education in the conditions of Covid-19 required the use of computer technologies at full capacity. Even if computer technologies were used in lessons before, we can state that this is a limited situation. However, the rapid transition that emerged in this period caused teachers to be

caught unprepared for the process. The sudden transition without any training in these technologies left the teachers in a difficult situation. We asked the next question to determine how valid this situation was for the teachers we surveyed.

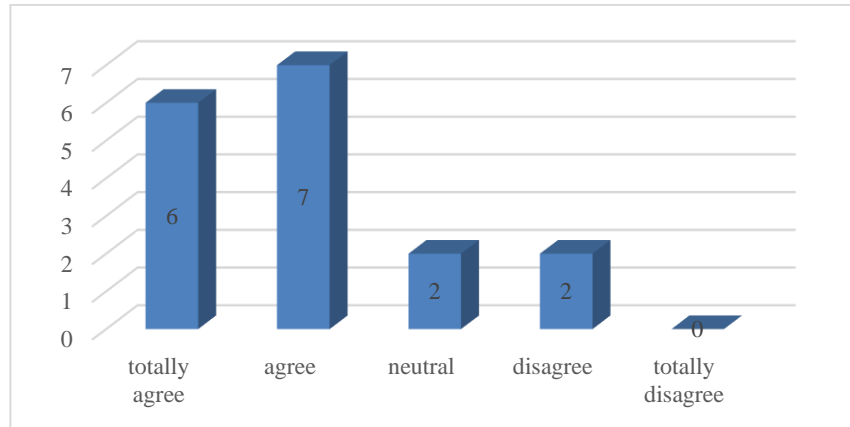


Figure 2: I encountered problems with the use of technology in online classes during the Covid-19 period.

As seen from the statistics, 11 (65%) of the teachers had problems with the use of technology during the online education period. Therefore, we can state that they do not fully know the content of the programs they use.

One of the problems that teachers encountered while providing online education in this process was that the program that they used gave errors and the teachers could not produce a solution. Especially the latest programs such as Zoom, which is used in lectures, has produced problems that are difficult to solve for teachers. In order to determine how valid this situation is among the teachers we surveyed, we asked them the next question.

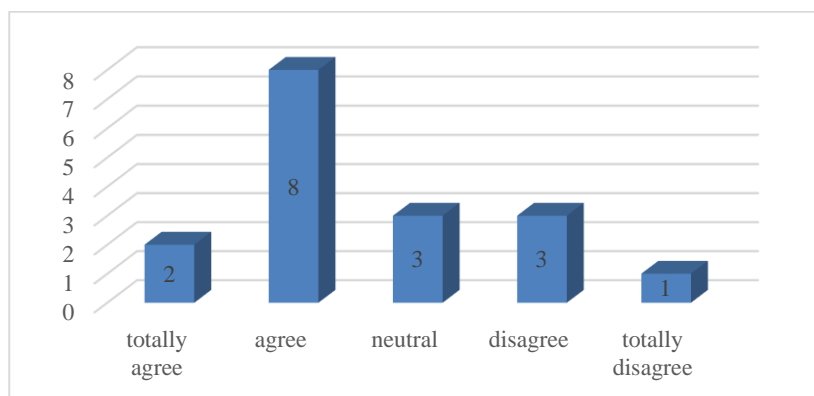


Figure 3: There were cases where I could not find a solution to the problems related to the programs I used in online courses

10 of the teachers (59%) stated that there were problems with some of the programs they used in online classes and that they could not find a solution. As can be seen, most of the teachers have experienced this problem.

If the above-mentioned problem arises, teachers can get help from students. Since these students are called digital natives, it can be stated that they tend to find solutions to such problems more quickly. Based on this idea, we asked the teachers whether they had such an experience.

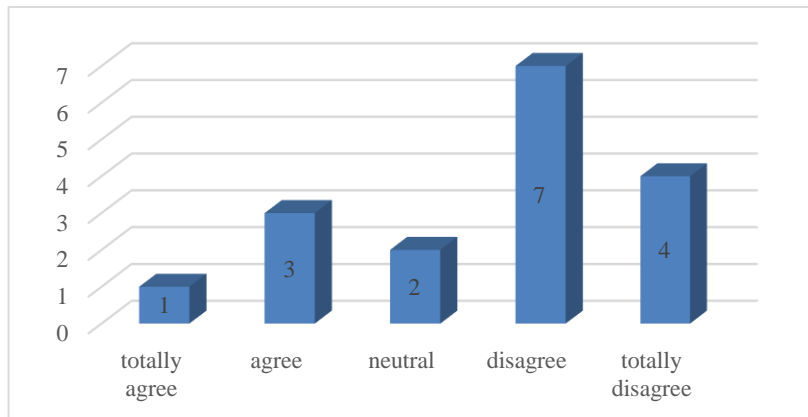


Figure 4: In this situation, I asked the students for help

4 of the teachers (24%) stated that they received help from students in such difficult situations. 11 teachers (65%) stated that they did not receive any help. The reason why the percentage of teachers who received help here is lower than our expectation may be that the communication with the students is online.

With the emergence of online education, it can be asserted that teachers had some problems with the Zoom program, which became widespread in those days. Since the teachers did not know some details of this program, they may have had problems during the online lessons. In this case, we asked the teachers if they knew the details of the Zoom program.

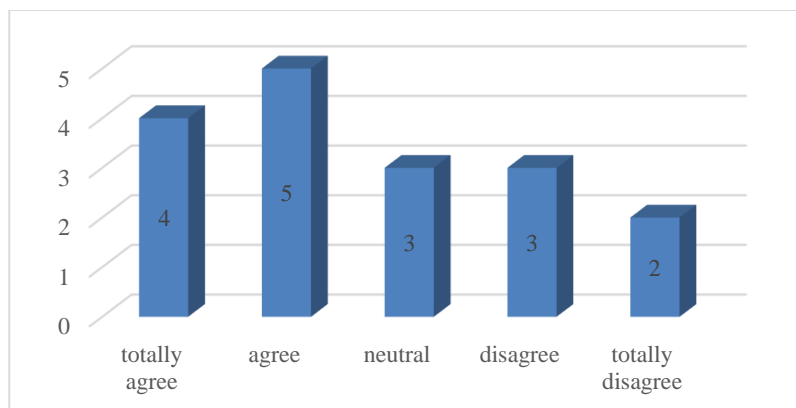


Figure 5: I did not know many aspects of the Zoom program

9 of the teachers (53%) stated that they did not know many details of this program and 5 teachers (30%) expressed a negative opinion on this subject and stated that they did not agree with this opinion. We can say that most of the teachers do not have full knowledge of all the details of the program.

The fact that the teachers did not know the details of the program led to the abuse by some students. Especially in the Zoom program, there were cases where they sabotaged the lesson by drawing on the screen. We asked the next question to reveal the extent to which such a situation was valid for the teachers we surveyed.

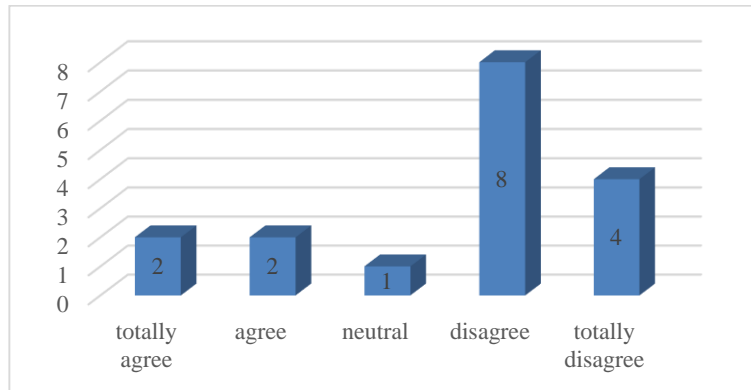


Figure 6: I encountered situations where students sabotaged the lesson because I did not know how to use the program

4 of the teachers (24%) stated that they encountered such a problem. 9 teachers (53%) did not encounter this problem. Although this issue was not investigated in depth in this study, it can be concluded that the different age characteristics of the students could be effective here.

Up to this question, the problems faced by teachers regarding modern technology were discussed. In the next questions, it was investigated how familiar the teachers were with the concepts such as technological content knowledge and technological pedagogical content knowledge used in the pedagogical content.

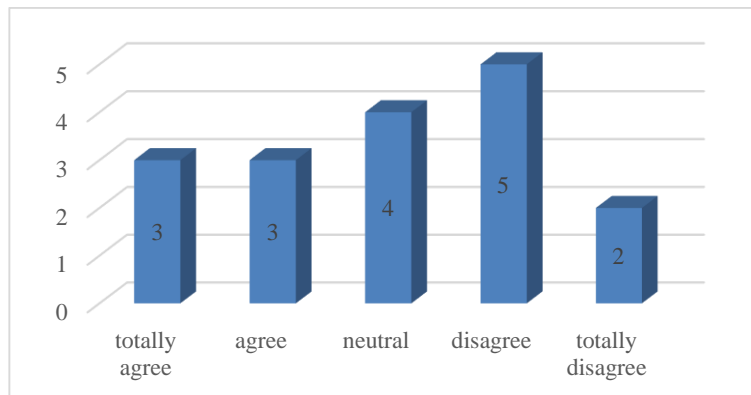


Figure 7: I know the meanings of concepts such as technological content knowledge and technological pedagogical content knowledge



In this question, where we asked the teachers whether they knew concepts such as technological content knowledge and technological pedagogical content knowledge, 6 (35%) of the teachers stated that they knew these concepts. 4 of them (24%) remained neutral on this subject and 7 teachers (41%) stated that they did not know these concepts. It is seen that a significant number of the teachers do not know these concepts.

In the previous question, we asked if teachers were familiar with these concepts. We asked the next question to examine how well they knew the contents of these concepts and, in parallel, how much they applied to their lessons.

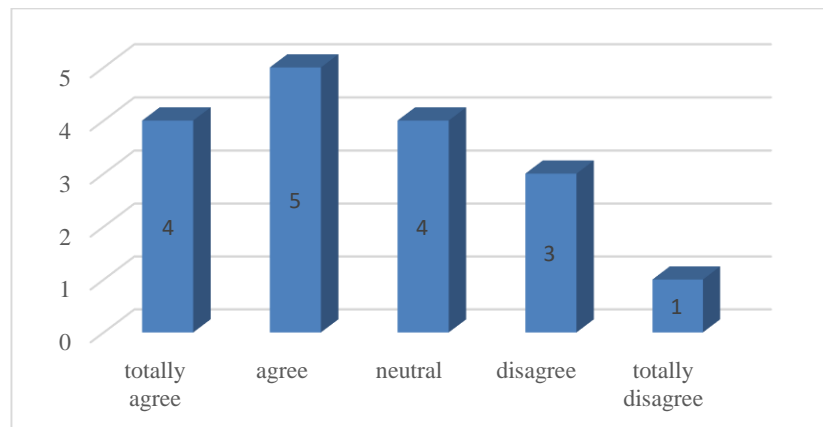


Figure 8: I have problems in terms of technological content knowledge and technological pedagogical content knowledge

9 of the teachers (53%) stated that they had problems with these concepts. 4 teachers remained neutral on this issue. The other 4 stated that they did not have any problems. Most of the teachers said that they had problems in this regard. An important reason for this is that constantly introducing new technologies to the field of education and adapting them by teachers requires a long time and experience. Since these teachers faced such situations a lot, they reflected their opinions here.

In the next step, we asked the teachers whether the technologies in the modern age are suitable for online education and how suitable the educational content is to transfer these technologies to the students through online education. First of all, we got the following answer in the question we asked the teachers about the technological infrastructure.

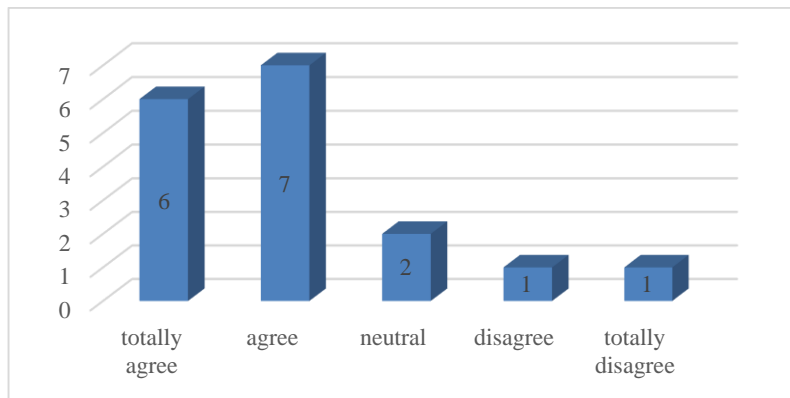


Figure 9: The current technological infrastructure in the Modern Age is available for online courses

13 of the teachers (76%) stated that the existing technological infrastructure is suitable for giving online courses. Here, this question was asked by taking into account the technological infrastructure of computers that run the programs as hardware, the software that is used for online education, and the internet infrastructure. Only 2 of the teachers stated that the existing technological infrastructure is insufficient.

Although the technological infrastructure is sufficient in their opinion, the reflection of the thoughts that the educational content is unprepared for this is discussed in the next question. Teachers were asked whether the educational content was ready for online education.

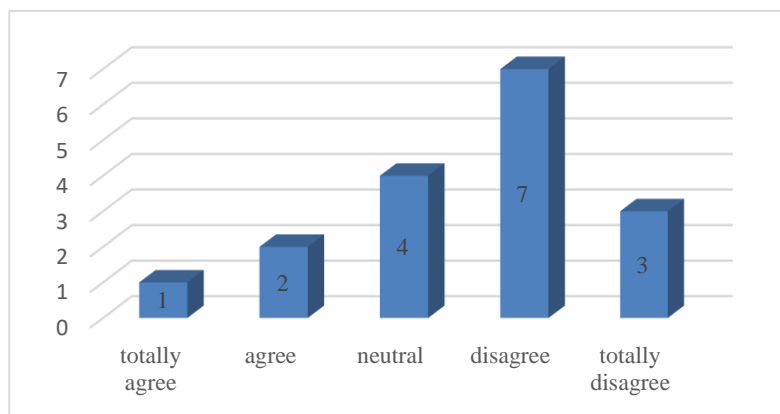


Figure 10: As the education community, I think we are ready for online education with our curriculum and materials

10 of the teachers (59%) stated that the education community is not ready for online education in terms of curriculum and material. Here, only 3 teachers expressed a positive opinion. On the other hand, 4 Teachers remained neutral on this issue. Therefore, although the technological infrastructure seems sufficient, we can find in the opinions of these teachers that the educational content is not ready yet.

#### **4. Discussion**

The main reason for using teachers over the age of 35 in this study is that these people are usually the generation of computer literacy problems. At this point, when we asked the teachers if they had problems with computer literacy, some of them stated that they had these problems. In addition, when we asked whether they had problems with the use of technology in online lessons during the covid-19 period, most of them stated that they encountered problems. Furthermore, a significant number of them said that they could not find a solution to the problems they encountered. As it can be understood from here, the problems of some of the teachers from the previous periods continue to exist in a different form. An important aspect of this situation is that the students they address are digital natives. In this case, when we asked the teachers whether they asked for help from the students, few of them stated that they asked for help. The reason for the lower rate than we expected here may be the fact that the education was conducted online and there was no face-to-face interaction.

After identifying the situations above, we asked the teachers if they had problems with the Zoom program they used during this period. We found that the majority of teachers here had problems with this program. For this reason, it was stated by the teachers that some students sabotaged some lessons. In fact, it is seen that some of the teachers continue their computer literacy problems from previous periods. After this point, when we asked the teachers whether they knew some technical concepts related to their profession and the pedagogical content, we realized that a remarkable part of them did not know these concepts.

In the next step, we asked teachers for their views on online education, which has been the subject of much debate over the past few decades. Since suddenly switching to online education during the Covid-19 period is an important experience for teachers, their opinions on this issue have been important. It has been observed that most of the teachers have the view that although the technological infrastructure is suitable for online education, the educational content is not suitable for online education.

As it can be understood from here, the problems related to technology have emerged not only at the point where the teachers do not have a good command of the content, but also at the point of the lack of educational content and materials. Online education in the Covid-19 process has shown that some teachers are not ready for online education, both as accumulation and adaptation of the education system.

#### **5. Conclusion**

Although the target of education is students, the importance of teachers, curriculum and materials is indispensable. Where these are problematic, it is not possible to talk about a quality education for students. The applicability of online education, which has been an important topic of discussion for the last few decades, has been better seen with online education during the covid-19 process. As it is highlighted in this study, although the technological infrastructure provides sufficient opportunities for online education, problems arise in other subjects. Especially the fact that teachers brought up in a certain generation have problems with computer literacy requires rethinking this issue. At this point, full online education does not seem to be applicable before the teachers' training on this subject is completed. In addition, as expressed in the teachers' opinions, the educational content and materials are insufficient in this regard.

One of the important limitations of this study is the sample. It should be noted that if this study is handled in another sample, it may yield different results. In addition, it can be thought that a more positive picture will emerge if the age restriction is removed.

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**Appendix: The Questionnaire**

	totally agree	agree	neutral	disagree	totally disagree
1. I think I have problems with computer literacy.					
2. I encountered problems with the use of technology in online classes during the Covid-19 period.					
3. There were cases where I could not find a solution to the problems related to the programs I used in online courses.					
4. In this situation, I asked the students for help.					
5. I did not know many aspects of the Zoom program.					
6. I encountered situations where students sabotaged the lesson because I did not know how to use the program.					
7. I know the meanings of concepts such as technological content knowledge and technological pedagogical content knowledge.					
8. I have problems in terms of technological content knowledge and technological pedagogical content knowledge.					
9. The current technological infrastructure in the Modern Age is available for online courses.					
10. As the education community, I think we are ready for online education with our curriculum and materials.					