# AN INVESTIGATION OF TEACHER PERSPECTIVES ON EMERGENCY REMOTE TEACHING IMPLEMENTED IN SCIENCE AND ART CENTERS DURING THE COVID-19 PANDEMIC

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**Abstract**

The purpose of this study was to determine teacher perspectives on emergency remote teaching conducted during the COVID-19 pandemic in science and art centers. The study was carried out using a phenomenological qualitative research design with 41 science and art center teachers from 17 different majors. A content analysis method was employed in this study that used a criterion sampling method and collected data through a semi-structured interview form. The study found that most teachers have not received any training on distance education, technique-based teaching cannot be employed in remote teaching processes, the planned activities remain unfinished, student-student and student-teacher interactions decrease, teachers mostly conduct emergency remote teaching online, and teachers improved themselves in technological equipment and the knowledge of teaching profession together with emergency remote teaching. It was also found that student participation is low and teachers find face-to-face education more effective than emergency remote teaching, experience problems in feedback and revision, cannot perform observation-based measurement and evaluation, and emergency remote teaching increases the workload. Teachers expected that the distance education could be carried out on a part-time basis after the pandemic and that they receive in-service education regarding distance education.

**Keywords:** COVID-19, Gifted Education, Science and Art Center, Emergency Remote Teaching, Teacher Perspectives, Curriculum

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**Introduction**

By the end of 2019, the world entered an unexpected course due to the new type of coronavirus, also called COVID-19, and countries were caught unprepared for this process. For this reason, countries diverted their assets to the health sector and economy, limiting public expenditures in education (Schleicher, 2020). The pandemic significantly affected educational activities at the national and international levels (Carrillo & Flores, 2020; Qureshi & Khawaja, 2021). As such, education was suspended in 191 countries because of the rapidly spreading virus, and more than one billion and 600 million students were negatively affected by this process (UNICEF, 2021; TEDMEM, 2020). According to a report published by UNESCO in June 2021, on average, 79 school days were suspended in low, middle, and high-income countries in 2020. Countries that suspended education, continued educational activities via TV, radio, and online platforms. In addition, 41% of countries extended the academic year, and 42% prioritized certain discipline areas or skills (UNESCO, 2021). These developments are big changes, leading to a quick break away from the traditional understanding of education (Stewart & Lowenthal, 2021). However, students were negatively and mentally affected in the process in terms of learning and participation in educational activities (Petillion & McNail, 2020).

Turkey was also one of the countries that suspended education due to COVID-19. The first COVID-19 case in Turkey was detected on March 11, 2020, and schools were suspended for two weeks as of March 16, 2020, by taking the mid-term holidays one week earlier. When the education was suspended, the infrastructure of the Educational Informatics Network (EBA), the digital education platform of the Ministry of National Education (MoNE), was strengthened and three different TRT EBA channels were established for primary, secondary, and high schools on March 23, 2020, in cooperation with TRT (Turkish Radio and Television Corporation). As of this date, the educational activities were carried out through emergency remote teaching via EBA and TRT EBA TV (MoNE, 2020a; MoNE, 2020b). However, the process which was planned originally for two weeks was extended first up to the end of April, then up to the end of May, and then up to June by deciding on the continuance of emergency remote teaching activities (MoNE, 2020c; MoNE, 2020d). In this period, all students were provided with three GB free of internet access, valid for using EBA, by the operators (MoNE, 2020a).

The emergency remote teaching contents for gifted students with superior performance in academic, creativity, leadership, or artistic areas (Renzulli, 2012) were shared through videos called 'Where am I in first aid, creative problem solving, particle physics, mathematics and mathematical modeling in our lives, artificial intelligence and programming, and ecology?' via the EBA system between 23-27 March 2020 per their experiences during the process (MoNE, 2020e). However, because of the prolonged break in education, emergency remote teaching activities also started in Science and Art Centers (SAC), where support education is provided for gifted students. SACs are the institutions established for providing support education to gifted students enrolled in preschools, primary schools, and secondary schools. In these institutions, the aim is that gifted students are aware of their abilities and use their capacities by developing them at the highest level (MoNE, 2019). During the COVID-19 process, teachers sent emergency remote teaching activities they prepared to the SAC administration on a weekly basis. In addition, the MoNE also prepared the digital application "I am Special. I am in Education" and made it available for utilization on Android and IOS devices.

What happened during the COVID-19 outbreak made the emergency remote teaching mandatory on the one hand, and on the other hand, highlighted the significance of distance education once again (Williamson, Eynon, & Potter, 2020). Distance education is "an educational process in which one delivers a significant part of education

far from the learner and/or time (Perraton, 1981). The distance education practice has a history of around 200 years, which started with teaching by letter. Currently, this practice continues by offering different teaching options to educators and students with materials like instructional texts, internet-based teaching systems, video recordings, simulations, animations, virtual reality, virtual laboratory, social media, online conference, offline communication environments, and different types of materials sent to students (Kışla, 2016; Phipps & Merisotis, 1999; Willis, 1993). Unlike planned and online designed educational activities, emergency remote teaching comprise teaching activities that emerged in an unexpected situation under pandemic conditions and are temporarily applied in crisis conditions. The main purpose of emergency remote teaching is to provide a temporary solution to the education crisis caused by the pandemic (Hodges, Moore, Lockee, Trust & Bond, 2020). The concept of emergency remote teaching seems to be a temporary concept, as educational activities will return to their original format when the pandemic crisis is over (Iglesias-Pradas, Hernandez-García, Chaparro-Pelaez, & Prieto, 2021).

The emergency remote teaching implemented by the MoNE through EBA and TRT EBA TV platforms came to the forefront in Turkey. However, these platforms were not utilized in support education practices concerning gifted students. One could argue that the SAC teachers have carried out emergency remote teaching activities based on their own efforts. Therefore, gifted students participated in both emergency remote teaching activities offered by MoNE or their schools and emergency remote teaching activities provided by SACs.

An examination of studies on emergency remote teaching carried out during the COVID-19 outbreak in the literature showed that there are many studies on evaluation of science lessons (Ayaz, 2021), problems encountered by different countries (Chang & Satako, 2020), preservice teachers' views (Görgülü-Arı & Hayır-Kanat, 2020), experience of teachers and parents (Güvercin, Elitok-Kesici, & Akbaşlı, 2021), challenges experienced by teachers (Kabuk & Demirtaş, 2021), teacher perspectives (Kurnaz, Kaynar, Şentürk-Barışık, & Doğrukök, 2020; Soeung & Chim, 2022), views of school administrators (Külekçi-Akyavua & Çakın, 2020), and views of undergraduate students (Qureshi, Khawaja, & Zia, 2020). In addition, there were some studies on the views of gifted students and parents (Aboud, 2021), and the perceptions of gifted students (Türksoy & Karabulut, 2020; Yıldız, Alkan, & Çengel, 2021) about the emergency remote teaching carried out during the COVID-19 outbreak. In this study, the data were obtained through student interviews. This shows that the opinions of teachers who taught gifted students during the COVID-19 process are not addressed. Therefore, it sounds essential to explore the lived experiences and problems of teachers in this process, the contribution of the process to teachers and their views on educational activities to be conducted in SACs after this process, the face-to-face and distance education activities to be conducted after this process, and their views about the education programs to be prepared in this regard.

**Purpose of the Study**
The main purpose of this study is to determine teacher perspectives about the emergency remote teaching carried out during the COVID-19 process in SACs. In line with this purpose, answers were sought to the question 'What are the teacher perspectives about the emergency remote teaching implemented in SACs during the COVID-19 outbreak?' According to this main question, answers were sought to the following sub-questions.

1. What are the qualifications of teachers with respect to distance education?

2. What are the views of teachers on the reflection of the pandemic on education processes in SACs?
3. What are the views of teachers about their comparison of face-to-face education with the emergency remote teaching carried out in SACs during the pandemic?
4. What are the views of teachers about how the education will be carried out in SACs after the pandemic?
5. What are the expectations and suggestions of teachers about the education in this process?

## Method

The research design should be clearly described and appropriate for the purpose of the study. This section includes the research design, study group, data collection tools, data collection, and data analysis sub-headings.

### Research Design

Interviews were conducted with SAC teachers at the end of the 2019-2020 school year to determine their views about the emergency remote teaching implemented in SACs during the COVID-19 process. Of qualitative research designs, a phenomenological design was employed in the study. In the phenomenological design, we focus on phenomena that we are aware of but do not perceive in-depth. In this design, individuals or groups who experience the phenomenon and can express the phenomenon constitute the data source, and the primary data collection tool is the interview (Yıldırım & Şimşek, 2018). Phenomenology focuses on how people perceive and make sense of the phenomenon. For this reason, in-depth interviews are conducted with people who have directly experienced the phenomenon. The focus is on creating meaning to describe, explain, and interpret experiences through interviews (Pattons, 2014). In this study, the emergency remote teaching activities carried out in SACs during the COVID-19 process were considered as the phenomena and the teachers who experienced this phenomenon as the data source, and the data were collected through semi-interviews. Semi-structured interviews help asking probing questions at appropriate times, revealing experiences in depth, and achieving objectives (Silverman, 2018).

### Study Group

Of purposive sampling methods, criterion sampling was employed in the study to determine the study group. Criterion sampling is the study of all situations by considering a set of criteria predetermined by the (Yıldırım & Şimşek, 2018). In determining the study group, the criteria set were that teachers are permanent teachers who are working in science and art centers and carrying out emergency remote teaching activities during the COVID-19 process. In this context, a total of 41 teachers, 22 females and 19 males, from 20 different SACs working in 18 fields participated in the study. They majored in Turkish, Primary Education Mathematics, Science, Social Science, English, High School Mathematics, Literature, Visual Arts, Music, Philosophy, Classroom Teaching, Geography, History, Technology and Design, Information Technologies, Physics, Chemistry, and Biology. One teacher had 0-5 years of teaching experience, two had 6-20, 15 had 11-15, 15 had 16-20, 7 had 21-25, and one had 25 years of experience and above. In addition, 28 of them had worked in SAC for 0-5 years, 7 for 6-10 years, and 6 for 11-15 years. Accordingly, most teachers had 11-20 years of professional seniority and their work periods in SAC mostly ranged between 0-5 years.

**Data Collection Tool**

A semi-structured form prepared by the researchers was used as a data collection tool. Questions were prepared for teachers to use in the study and sent to two experts in curriculum and instruction. The experts had suggestions concerning two questions. After receiving feedback, the questions in the form were revised. The main questions in the data collection tool are as follows, and the interviews were somewhat flexible. According to Merriam (2013), questions in semi-structured interviews should be flexible within specific limits.

1. Have you receive any training on distance education before? Do you feel yourself adequate in distance education?
2. Did the Ministry of National Education provide an infrastructure related to distance education during the COVID-19 process? How do you conduct distance education in this process? How has this process affected your professional skills?
3. What are the positive and negative aspects of the distance education conducted during the COVID-19 process?
4. When the distance education implemented in SACs and face-to-face education are compared, what kind of differences do you see in which dimensions?
5. How do you think the education at SACs will be after the COVID-19 process? What are your expectations and suggestions for education in SACs?

After conducting pilot interviews with two teachers, the questions in the form were finalized and administered. The form also included closed-ended questions regarding the demographic characteristics of the participants. These questions were asked about the participants' gender, branch, professional seniority, the SAC where they worked, and their working duration at SAC?

**Data Collection and Analysis**

The data were collected using a semi-structured interview form prepared by the researchers. Teachers participating in interviews were contacted by phone and informed about the research, and interviews were conducted with the volunteer teachers through video calls on the phone. Interviews were recorded on a voice recorder device, transferred to a computer, and transcribed. The interviews conducted with teachers lasted for 27 minutes on average. The shortest interview lasted 21 minutes and 18 seconds, and the longest one lasted for 43 minutes and 28 seconds.

A content analysis method was employed in analyzing the data collected from teachers. The data obtained from teachers were read and coded one by one, and then relevant themes were created. Attempts were made to establish the internal validity by considering that the themes and interpretations reached reflect the truth. Furthermore, the coding reliability was determined after 10% of teacher responses were randomly selected and recoded by an expert in curriculum and instruction. The inter-coder reliability was computed using a formula (Reliability = Consensus / [Consensus + Disagreement]) proposed by Miles and Huberman (2015). The inter-coder reliability was 0.86 for the teacher interviews. Codes were provided while presenting direct quotations. Codes such as T1, F, 17, 5 were given to illustrate which teacher the direct quotation comes from. Of these codes, T1 indicates the order in which the views of teachers were analyzed, F indicates that the teacher is female, 17 indicates the professional seniority of the teacher, and 5 indicates the teachers' working duration at SAC. To ensure the validity of the study, an exemplification method was used and direct quotations were provided after the findings.

**Findings**

Findings related to teacher perspectives on emergency remote teaching implemented during the COVID-19 period in SACs are provided below.

**Distance Education and Qualification of Teachers**

Findings regarding the views of teachers related to the question "Do feel yourself adequate in distance education?" are given in Table 1.

**Table 1.**
*Views of the SAC Teachers on their Distance Education Training*

| Themes | Sub-Themes | Codes | f |
|---|---|---|---|
| Perceptions of Distance Education | Having Training | Did not receive | 30 |
| | | Received | 11 |
| | Adequacy Perception | Feel inadequate | 16 |
| | | Feel adequate | 14 |
| | | Feel somewhat adequate | 11 |

As per Table 1, views on receiving distance education are compiled under two sub-themes. Under the theme of receiving training, 11 teachers received training on distance education but 30 others did not. Under the theme of adequacy perception, 14 teachers felt adequate in distance education, 11 somewhat adequate, and 16 inadequate. However, under the sub-theme of desiring to receive training, 25 teachers wanted to receive training on distance education, five did not, seven teachers who had received training previously did not want to receive training again, and four of them wanted to receive training once again. Some teachers disclosed their views as in the following:

*"I have not received any training on distance education before. I would love to receive one because I feel inadequate in this regard" (T12F,14,2).*

*"I had taken distance education courses and taught distance lessons at a foundation, which is a non-governmental organization, where I used to work previously. As someone with experience in distance education, I have experience in using digital tools and platforms in distance education" (T38M,21,3).*

**The Impact of COVID-19 Outbreak on Education Process in SACs**

Findings relating to the views of teachers regarding the question "How was the education process in SACs affected during the COVID -19 outbreak?" are presented in Table 2. As shown in Table 2, teacher perspectives about the impacts of the COVID-19 process on the educational process in SACs gathered under three themes.

Under the theme of applications utilized in the emergency remote teaching process, sub-themes including online meeting applications, spontaneous messaging and calling applications, Web 2.0 tools, virtual classrooms, social media, and presentation-making software were determined. The sub-theme of online meeting applications includes the codes Zoom (24) and Teamlink (4). The sub-theme of spontaneous messaging and calling applications the code WhatsApp (23) and the sub-theme of Web 2.0 tools included the codes Padlet (3) and Kahoot (3). Further, the sub-theme of digital letter included the code email (6), the sub-theme of virtual classroom included the code Google Classroom (5), the sub-theme of social media include the code Facebook (4), and the sub-theme of presentation-making application included the code PowerPoint presentation (3). Some teachers disclosed their views as in the following:

**Table 2.**
*The Impact of COVID-19 Outbreak on the Education Process in SACs*

| Themes | Sub-Themes | Codes | f |
|---|---|---|---|
| Applications Utilized | Online Meeting Platforms | Zoom | 24 |
| | | Teamlink | 4 |
| | Spontaneous Messaging and Calling Applications | WhatsApp | 23 |
| | Web 2.0 Tools | Padlet | 3 |
| | | Kahoot | 3 |
| | Digital Letter | Email | 6 |
| | Virtual Classroom | Google Classroom | 5 |
| | Social Media | Facebook | 4 |
| | Presentation-Making Software | PowerPoint presentation | 3 |
| Challenges Encountered | Technological Infrastructure | Inability to provide Infrastructure | 34 |
| | | Inadequate technological equipment of students | 6 |
| | Teaching-Learning Inadequacies | I to provide effective and adequate feedback | 3 |
| | | Providing little emotional support | 2 |
| | General Problems | Students' prioritizing their school works | 9 |
| | | Incapability of using EBA | 4 |
| | | Zoom security issues | 4 |
| Personal Experiences | Planning | Inability to accomplish the planned educational activities | 12 |
| | | Getting caught unprepared | 10 |
| | | The obligation of planning new activities | 2 |
| | Teaching-Learning Process | Inability to conduct activity-based teaching | 14 |
| | | Decline in student participation | 8 |
| | | Causing anxiety and stress in students | 5 |
| | | Inability to control the learning process | 5 |
| | | Decline in interaction | 5 |
| | Contribution to Professional Development | Improving oneself in technological equipment | 29 |
| | | Development in professional knowledge and skills | 12 |
| | | Enabling branch – group teacher collaboration | 6 |
| | | Development of skills in instructional design | 6 |

*"I carry out the activities I have prepared in PowerPoint by sending them to students through WhatsApp. I have students do one activity a week using fun puzzles and questions. I often try to have them perform fun activities where students won't get bored" (T32,M,18,12).*

*"In this process, we continued to communicate with our students by creating virtual classrooms and actively using various web tools. Our main goal was to ensure that they did not break away from the process. Therefore, I started using Google classroom" (T38,M,21,3).*

Under the theme of challenges encountered, the sub-themes of technological infrastructure, teaching-learning inadequacies, and general problems were determined. The sub-theme of technological infrastructure included the following codes: inability to provide infrastructure (34) and inadequate technological equipment of students (6). The sub-theme of teaching-learning inadequacies included codes, such as inability to provide effective and adequate feedback (3) and providing little emotional support (2). Moreover, the codes under the sub-theme of general problems were students' prioritizing their school works (9), incapability of using EBA (4), and Zoom security issues (4). Teachers expressed their opinions as in the following:

*"… This is because distance education is provided for them in the EBA and EBA TV. However, there is nothing for the SACs. As teachers, we try to do something in the SAC. Obviously, not much has been done for us" (T14,M,14,2)*

*"We suspended our virtual meetings after media reports and parents' concerns about virtual meeting tools. After that, we switched to a way of working, where the weekly activities, doable at home, had to be sent to the children (via WhatsApp application to parents' phones), and the children had to complete their activities and send them back to us as we required. However, the students' inability to use technology at an adequate level is the problem that stands in our way" (T31,F,14,5)*

Under the theme of personal experiences, sub-themes such as planning, teaching-learning process, and contribution to professional development were determined. The sub-theme of planning included codes such as the inability to accomplish the planned educational activities (12), getting caught unprepared (10), and the obligation of planning new activities (2). Further, under the sub-theme of teaching-learning process, there codes such as the inability to conduct activity-based teaching (14), decline in student participation (8), decline in interaction (5), inability to control the learning process (5), and causing anxiety and stress in students (5). Teachers expressed their opinions as in the following:

*"We cannot do any activity unless the children come together. Verbal explanations are being made, but such explanations remain a secondary choice for us because there are experiments, practices, and projects, and we cannot do anything like this in this COVID-19 period from afar right now" (T7M,15,5).*

*"While schools, especially the private schools, can benefit from EBA and the private schools can also benefit from different platforms, we cannot. There is no such a chance in SACs. Our education and atelier activities remained unfinished. Although we try to do something with good intentions, it cannot always be*

*effective with our own efforts. This is because we cannot fully apply the logic of SAC" (T13F,14,3).*

**Table 3.**
*Teacher perspectives about the comparison of emergency remote teaching applied in SACs with face-to-face education*

| Theme | Sub-Theme | Codes | f |
|---|---|---|---|
| Interaction | Student-Teacher Interaction | Decreasing interaction | 8 |
| | | Increasing interaction | 1 |
| | Student-Student Interaction | Decreasing student-teacher interaction | 9 |
| Teaching-Learning Process | Material Utilization | Inability to access enough material | 10 |
| | | Requiring using different materials | 5 |
| | | Producing original designs | 3 |
| | | Obligation of choosing activities without materials | 2 |
| | Strategies, Methods, and Techniques | Inability to use different methods and techniques (limitation in methods and techniques) | 17 |
| | | Going for teacher-centered methods | 7 |
| | | Inability to perform individualized teaching | 2 |
| | | Inability to conduct group activities | 2 |
| | Problems in Implementation Process | Low student participation | 18 |
| | | Inability to control the studying process at home (parent contribution, internet use, etc.) | 8 |
| | | Decrease in motivation | 7 |
| | | Incompatibility of emergency remote teaching with SAC activities/inability to conduct practical activities | 7 |
| | | Short lesson periods in emergency remote teaching | 3 |
| | | Adequate student participation | 3 |
| | | Showing flexibility to students | 2 |
| | Assessment and Evaluation Processes | Encountering problems in feedback and revision | 18 |
| | | Inability to do observation-based assessment and evaluation | 18 |
| | | Parent involvement | 1 |
| Other Opinions | Comparing the effectiveness | Face-to-face education is more effective | 22 |
| | Workload | Increase in teachers' workload | 10 |
| | Comprehensibility | Not comprehensive | 7 |
| | Technological Issues | Inadequacy of technological tools | 4 |
| | | Internet connection problems | 4 |

Further, the sub-theme of contribution to professional development under the theme of personal experiences included the following codes: improving oneself in technological equipment (29), development in knowledge and skills of the teaching profession (12), enabling branch-group teacher collaboration (6), and development of skills in instructional design (6). Teachers expressed their opinions as:

*"In this period, I had the opportunity to learn about web 2.0 tools. Actually, I was kind of forced to do so. We also share our activities with each other as SAC*

*teachers. I have been able to closely follow the activities of SAC teachers and prepare new activities with ways to improve them" (T12F).*

*"It positively affected my professional skills. We had the chance to experience tools we can use in distance education. We had learn many things but had never put them in practice. We had the opportunity to use them. I remembered things we had forgotten" (T39M).*

## A Comparison of Emergency Remote Teaching Implemented in SACs with Face-to-Face Education

Findings regarding the views of teachers related to the question "When comparing the emergency remote teaching and face-to-face education carried out in SACs, what kind of differences do see in which dimensions?" are given in Table 3. According to Table 3, the views of teachers on the comparison of emergency remote teaching and face-to-face education applied in SACs have gathered under three themes. The theme of the teacher perspectives about the comparison of distance education applied in SACs with face-to-face education included the following codes: decreasing interaction between students (9), decreasing student-teacher interaction (8), and strengthening teacher-student bond (1). Teachers expressed their views as follows:

*"Here, we used to write Babylonian numbers on the clay and conduct activities in regard to them, and the children used to prepare and ask questions to each other. I mean, obviously, there was a lot of interaction. However, the children are alone at home during the ongoing distance education. They can only communicate with their friends if they have a live connection, which is also quite limited there" (T5F, 16,5).*

*"The biggest difference is the lack of socialization. Interaction with us and their friends is very limited and learning processes such as group work, brainstorming, and discussion are not possible in distance education, especially for the support groups" (T28F, 16,1).*

The sub-theme of material utilization under the theme of teaching-learning process included codes such as being unable to procure enough materials (10), requiring using different materials (5), producing original designs (3), and obligation of choosing activities without materials (2). Teachers expressed their opinions as in the following:

*"In this process, material use is kept at a minimal level. Activities are planned using materials that students can find at home" (T27F,11,1).*

*"First of all, none of the robotic tools I used in the field of informatics were accessible. Instead, I turned to the digital tools they could access. Web 2.0 tools were on top of them" (T35F,12,4).*

The sub-theme of using methods, strategies and techniques under the theme of teaching-learning process included codes such as inability to use different methods and techniques (17), going for teacher-centered methods (7), inability to perform individualized teaching (2), and inability to conduct group activities (2). Teachers expressed these views as follows:

*"I tried to ensure student participation in lessons through strategies like ask and answer questions and discovery learning. However, this part is diminishing evermore. After asking a limited number of questions and attracting attention, I explain and show. It cannot be demonstrated" (T18F,15,4).*

*"It affected the face-to-face education more. I cannot use the methods and techniques I want in distance education. What can I do for conducting experiments? I just have to explain the topics" (T40M,17,6).*

The sub-theme of problems in implementation process under the theme of teaching-learning process included the following codes: low student participation (18), inability to control the studying process at home (8), decrease in motivation (7), incompatibility of emergency remote teaching with SAC activities/ inability to conduct practical activities (7), short lesson periods in emergency remote teaching (3), adequate student participation (3), and showing flexibility to students (2). Teachers expressed these views as follows:

*"In this period, the number of students participating in activities reduced, too. Under these circumstances, everything can turn into a problem" (T23M,15,1).*

*"I observe that students are reluctant from time to time than the face-to-face education process. I can attribute this situation to the fact that there are no obligations in SAC and there are many tasks from their own school during online education" (T16F,19,1).*

*"Considering the current practices I have done in science class, we do more practical work in face-to-face education but more thinking activities, discussion, and expressing ideas in distance education." (T27F,11,1).*

The sub-theme of assessment and evaluation prcess under the theme of teaching-learning process included the following codes: encountering problems in feedback and revision (18), inability to do observation-based assessment and evaluation (18), and involvement of parents in assessment and evaluation process (1). Teachers expressed these views as follows:

*"Doing assessment and evaluation gets difficult. At the SAC atelier, you make observations, you talk, the student answers your question, but we don't have a chance to do that here. (T21F,27,2).*

*"Since my field is music, face-to-face education is a must. It is of great significance to intervene to students right away and correct the mistake before they repeat it. If the mistakes are not corrected, it is very difficult to correct them later" (T22M,22,15).*

The sub-theme of comparing the effectiveness under theme of Other Views included the following codes: face-to-face education is more effective (22), the sub-theme of workload included the code, increase in teachers' workload (10), the sub-theme of comprehensibility included the code, non-comprehensibility of emergency remote teaching (7), and the sub-theme of technological issues included the codes, inadequacy of technological tools and internet connection problems (4). Teachers expressed these views as follows:

*"I think that face-to-face education is more beneficial for students and teachers in every sense. I think that teachers who have not received a course, a seminar or any training on distance education, in particular, will not be that efficient."* (T10F,10,5).

*"I have twice-exceptional students, and it have never been able to contact them because they don't talk on the phone. From this perspective, we have problems in distance education"* (T25F,23,5).

**Status of Education in SACs after the COVID-19 Period**

Findings relating to teacher perspectives regarding the question "What do you think the education in SACs will be like after the COVID-19 outbreak?" are given in Table 4.

**Table 4.**
*Views of teacher about what the education in SACs will be like after the COVID-19 outbreak*

| Theme | Sub-Themes | Codes | f |
|---|---|---|---|
| Views on the continuance of current education in SACs | Health Measures | Hygiene | 8 |
| | | Social Distance | 4 |
| | Technological Equipment | Promoting skills in digital tools and technology utilization | 2 |
| | | Increasing the number of ateliers and equipment | 2 |
| | Curriculum | Curriculum content will be changed (COVID-19 projects and studies) | 4 |
| | No Change | Normal education will continue | 8 |
| Views on the continuance of education through distance education | Curriculum Development | Developing curriculum for the distance education | 7 |
| | | Providing in-service training about distance education | 6 |
| | Technology and Its Utilization | EBA like infrastructure should be provided | 4 |
| Views on the use of distance education in SACs in the future | Equal Opportunities | Part-time distance education (project and eighth grade classes) | 13 |
| | | Distance education for students having transportation issues (equal opportunities) | 6 |
| | | Should be in urgent situations | 4 |
| | Teaching-Learning Process | Technology-aided distance education | 3 |

Considering Table 4, teachers' views on what the education will in SACs will be like after the COVID-19 outbreak have gathered under three themes. As seen in Table 4, the theme of teacher perspectives on what the education will be like in SACs consisted of sub-themes such as views on normal education at SACs, views on the preparation process for distance education, views on the use of distance education, and views on the use of distance education in SACs in the future.

Under the theme of views on the continuance of current education in SACs, health measures, technological equipment, and curriculum sub-themes were determined. The health measures sub-theme included the following codes, hygiene (8) and social distance (4). The sub-theme of technological equipment included the following codes,

digital tools and technology utilization skills will be promoted (2) and the number of ateliers and equipment will be increased (2). Lastly, the sub-theme of curriculum included the following codes, the normal education will continue (8) and the curriculum content will be changed.  Teachers expressed these views as follows:

> *"In SACs, children come from different schools. However, measure could be taken for hygiene and ateliers. Changes may occur in the educational content. Changes or eliminations could be made in the curriculum" (T19F).*

> *"Education continues normally in SACs, as long as the COVID ends. For example, I have not adopted distance education. However, our problem is that students come from different schools, which can be a problem in terms of health" (T21F).*

Under the theme of views on the continuance of education through distance education, the sub-themes of curriculum development and technology utilization were determined. The curriculum development sub-theme included the codes, developing curriculum for distance education (7) and providing in-service training about distance education (6). However, the sub-theme of technology and its utilization included the codes, and EBA like infrastructure should be provided (4). Teachers expressed these views as follows:

> *"I think I felt a need at EBA, especially to see if there is a place where we can meet with students in common, which will necessarily be reflected in general. I mean, there should be changes in the SAC format. At least, while normal education is continuing, even if there is no such an outbreak, an EBA-like infrastructure should be activated in SACs for us to use," (T2M).*

> *"Concerning the preparation of digital content, students and teachers can be subjected to training, and teachers can be trained in this regard, that is, for distance education" (T11M).*

Under the theme of views on the use of distance education in SACs in the future, the sub-themes of equal opportunities, teaching-learning process, and other were determined. The sub-theme of equal opportunities included the codes, part-time distance education (13), distance education for students having transportation issues (6), and should be used in urgent situations (4). Moreover, the sub-theme of teaching-learning process included the code, technology-aided distance education (3). Teachers expressed these views as follows:

> *"For example, those who come from districts and cannot come every week, or those who can never come to SAC, and have passed the SAC exam but cannot come to the SAC. To overcome their absence and complete disconnection from the SAC, they could be kept in SAC through distance education. The kid's village is located in 1-2 hours away. Distance education could be provided for those kinds of kids" (T5F,16,5).*

> *"If distance education is used in SACs, Web 2.0 technology attract students' attention more. A different richness can be provided by using Web 2.0 tools in activities" (T15M,19,1).*

*"I think distance education will be conducted alongside face-to-face education in the field of art. Perhaps, it could take place in other fields, too. I think that they could even use it more than us" (T41M,15,5).*

**Expectations and Suggestions Concerning Education in SACs**

Findings regarding the views of teachers related to the question "What are your expectations and suggestions for the education in BİLSEMs?" are given in Table 5.

**Table 5.**
*Teacher Perspectives on Expectations and Suggestions Concerning Education in SACs*

| Sub-Themes | | Codes | f |
|---|---|---|---|
| Suggestions for Education in BİLSEMs | Suggestions Concerning SAC Teachers | In-service training given to teachers should be increased | 12 |
| | | Training should be provided on distance education | 4 |
| | | Interdisciplinary collaboration between teachers | 3 |
| | | The teacher selection process should change | 3 |
| | | Branch workshops should be organized | 2 |
| | | Equal rights between teachers | 2 |
| | | Traineeship of teachers appointed to SAC for the first year | 2 |
| | Suggestions Concerning SAC Students | All students should be screened / the selection process should be improved | 5 |
| | | Student attendance days should be reduced / their workload should be reduced | 4 |
| | | Training should be provided on distance education (student-parent) | 3 |
| | | The time students spend in SAC should be increased | 2 |
| | | Positive discrimination should be done for students | 2 |
| | Suggestions concerning the physical conditions of SAC | Ateliers should be enriched in terms of materials | 8 |
| | | Improve the physical conditions of SAC and ensure standards | 5 |
| | | The infrastructure of SACs should be improved/Distance education infrastructure | 3 |
| | Suggestions for Teaching-Learning Processes in SACs | SAC should be a full-time school | 7 |
| | | Student group size should be reduced | 5 |
| | | Individualized education should be given importance (interest and ability) | 5 |

As shown in Table 5, expectations and suggestions concerning the education in SACs have gathered under four sub-themes. The sub-themes under this theme were suggestions concerning SAC teachers, suggestions concerning SAC students,

suggestions concerning the physical conditions of SAC, and suggestions concerning the teaching-learning process of SACs.

The sub-theme of the suggestions concerning SAC teachers included the following codes: in-service training given to teachers should be increased (12), training should be provided on distance education (4), interdisciplinary collaboration between teachers (3), the teacher selection process should change (3), equal rights between teachers (2), and branch workshops should be organized (2). Teachers expressed these opinions as in the following:

> *"I think our colleagues have to be trained in a short time. They had a very nice activity with us; how an activity is written. It could be a similar nice training."* (T8M,20,11).

> *"It would be useful to develop the positive aspects of distance education and make it a part of education as an option. Maybe teacher training could be conducted for this"* (T15M,19,1).

The sub-theme of suggestions concerning SAC students included the following codes: all students should be screened / the selection process should be improved (5), student attendance days should be reduced (4), training should be provided on distance education (3), the time students spent in SAC should be increased (2), positive discrimination should be done for students (2), educate students with 21st-century skills (1), provide more social-emotional support (1), and conduct activities that increase teacher-student interactions (1). Teachers expressed these views as follows. Teachers expressed these views as follows.

> *"Yet, for this purpose, first of all, the number of students screened should be increased or all students should undergo screening. If done like this, more students will be given perspective towards SAC"* (T30F,20,9).

> *"I would say there are two points in this regard. Reconsidering the Saturday and Sunday courses is important. I think this is not a positive practice for either the teacher or the student."* (T25F,23,5).

The sub-theme of suggestions concerning the physical conditions of SAC included the following codes: enriching ateliers in terms of materials (8), improving the physical conditions of SAC and ensuring standards (5), improving the distance education infrastructure in SACs (3), and increasing the number of SACs (1).

> *"I want them to invest in SAC, for example, in terms of training, equipment, and providing ateliers. I know that the atelier is weak and I am trying to develop it with my own resources"* (T3F,13,2).

> *"First, I expect that the physical environment is made suitable for SACs. This situation affects our ateliers and the perspectives of students and parents towards SACs"* (T40M,17,6).

Suggestions concerning the functionality of SAC included the following codes: SAC should be a full-time school (7), student group size should be reduced (5), individualized education should be given importance according to interest and ability (5), activities that increase the importance of the social sciences course (1), year-end

project exhibitions could be organized (1), project students should continue with distance education through the distance education (1), the measurement and evaluation system should be improved (1), activities based on learning by doing (1), and a special TV channel should be created for SAC students (1).

> *"SACs should be educational institutions that have their own students, just like schools." (T24M,16,2)*

> *"Instructors and students can continue their activities on a platform after the curriculum is created according to the needs of each field." (T22M,22,15)*

## Discussions and Conclusion

This study aimed to determine teacher perspectives on emergency remote teaching implemented during the COVID-19 process. Therefore, 41 teachers working at SACs were interviewed and the following conclusions were reached in line with their views.

The study found that one-fourth of teachers had received training on distance education previously and the rest had not. In addition, half of the teachers perceived themselves inadequate in distance education. In line with these results, most of the participating teachers in the research did not receive any training on distance education and needed training in this regard. Similarly, Satmaz and Evin-Gencel (2020) concluded that the number of in-service training implemented for SAC teachers is insufficient. Therefore, one could argue that this situation is due to the insufficiency of in-service training provided to SAC teachers. A study conducted by Kaya (2020) also concluded that the number of programs on the use of technology in in-service training for all teachers is small. In addition, in undergraduate teacher education programs, the Open and Distance Learning course is compulsory only in Computer Education and Instructional Technology (CEIT) department of teacher education programs in education faculties, whereas it is an optional course in other programs (Usta, 2018). The study conducted by Bursa and Ersoy (2020) found that the professional knowledge course that prospective teachers consider the least necessary is the Open and Distance Learning course. This might be because the Open and Distance Learning course is an optional course and thereby the pre-service teachers consider it the least necessary course.

Teacher perspectives in this study indicate that COVID-19 outbreak has negatively affected the education process in SACs. Failure to conduct activity-based education, inability to complete planned activities, getting caught unprepared during the pandemic, decline in student participation, decline in interaction, inability to control the learning process, causing anxiety and stress in students, and obligation of planning new activities were among the negative impacts. The fact that teachers were caught unprepared for emergency remote teaching during the COVID-19 process led to substantial problems in education (Özalkan, 2021). A study conducted by Can (2020) to investigate the effects of open and emergency remote teaching practices found that the participation of students was low in emergency remote teaching lessons. This situation is also stated by UNICEF (2020). Duraku and Hoxha (2020) also concluded that the 9th and 10th-grade students were negatively affected by the COVID-19 process and had experienced negative feelings like loneliness and loss of motivation. Similarly, studies conducted by Türksoy and Karabulut (2020) and Aboud (2021) with gifted students found that the emotional development of students was negatively affected.

In addition, teachers encountered problems with the lack of infrastructure, students' prioritizing their formal education studies, students' inadequate technological equipment, inability to use EBA, Zoon security issues, inability to provide effective and

adequate feedback, providing little emotional support, and teachers' inadequate technological equipment. Similar to the results of the study, Zhang, Wang, Yang, and Wang (2020) concluded that the infrastructure was inadequate, teachers had no experience in emergency remote teaching, and had insufficient knowledge. Similarly, Külekçi-Akyavuz and Çakın (2020) found inadequacy of technological equipment, internet access issues, inability to use EBA, and teachers' inadequate technological equipment were the problems experienced.

Moreover, a study conducted by Kurnaz, Kaynar, Şentürk-Barışık, and Doğrukök (2020) with 418 teachers concluded that teachers experienced problems in finding materials related to emergency remote teaching, failing to provide sufficient feedback and correction, and loss of motivation in students. In their study with 43 teachers, Kavuk and Demirtaş (2021) also concluded that students' inadequate technological tools, internet connection issues, unequal opportunities, inadequacy of the EBA system, students' inability to take active participation in lessons, technical disruptions, and the like were problems experienced in emergency remote teaching implemented during the COVID -19 outbreak. Other problems teachers experienced were the inability of conducting activity-based activities and completing the planned educational activities. This might be due to the implementation of activity-based education in SACs based on learning by doing, the insufficiency of practices in distance education requiring such activities, and the fact that our country was caught unprepared for the process. Concerns of teachers regarding the technological equipment might be due to emergency remote teaching carried out during the COVID -19 outbreak.

Teachers believed that COVID-19 outbreak had both positive and negative impacts on education processes in SACs. In this process, they improved their professional knowledge and skills, their skills in using technology effectively, designing teaching, and preparing fun activities besides providing branch and group collaboration. Similarly, the study conducted by Nambiar (2020) concluded that teachers improved themselves in professional skills and technology utilization and learned innovative teaching methods and techniques during the COVID-19 outbreak. Another research conducted by Önan and Menekay (2021) found that teachers performed professional and personal development activities to be beneficial to their students. Reimers and Schleither (2020) reported that teachers' professional development activities, using different methods and techniques, and improving their technology literacy will be effective in solving problems during the pandemic. Accordingly, these development activities of teachers will have effective outcomes for the pandemic process.

In addition, teachers who participated in the study utilized online meeting platforms like Zoom, Teamlink, plus applications and tools such as WhatsApp, e-mail, Web 2.0 tools, virtual classrooms, social media, and PowerPoint. Likewise, studies conducted in Sweden by Berghdal and Nouri (2020) and in Cambodia by Soeung and Chim (2022) also found that teachers use applications such as Zoom, Google Meet, Microsoft Teams, and Google Classroom in emergency remote teaching processes. Similarly, in a study conducted by Ayaz (2021) with teachers and students, it was found that Web applications, Zoom, Skype, WhatsApp, YouTube, and virtual classrooms were used in the process. Kavuk and Demirtaş (2021) also found that tools and applications such as Zoom, WhatsApp, and Telegram were utilized in emergency remote teaching.

Teachers also drew attention to the Zoom security problems, which, as also noted by Kerres (2020), necessitates the elimination of ethical concerns about the online teaching environments. Here, teachers may have felt obliged to improve themselves in order to use these tools. In addition, the Ministry of National Education has not prepared an infrastructure for SACs concerning distance education, which could be a significant deficiency. This could be interpreted as the fact that the Ministry of National Education was caught unprepared in areas such as educational programs, technological

equipment, and teacher competencies, and therefore differentiated education for gifted students was pushed into the background.

The study found that student-student and student-teacher interaction decreased in emergency remote teaching, teachers were unable to use enough materials, they needed different materials, and produced unique designs. Chang and Satako (2020) also found that socialization weakened due to a decline in student-student and student-teacher interaction. Moreover, teachers stated that they were unable to use different methods or techniques or include individualized education and group activities, and therefore went for teacher-centered methods and Web 2.0 methods and techniques. They stated that student participation and motivation in the teaching-learning process is low, they cannot control the studying process at home, and emergency remote teaching is incompatible with SAC activities. Teachers who participated in the study stated that they experienced problems in feedback and correction in assessment and evaluation and were unable to conduct observation-based assessment and evaluation.

Teachers also stated that face-to-face education is more effective relative to emergency remote teaching, the emergency remote teaching process increases teachers' workload, the emergency remote teaching is not comprehensive, and that they experienced problems with the inadequate internet and technological tools. Similarly, studies conducted by Görgülü-Arı and Hayır-Kanat (2020) and Güvercin, Elitok-Kesici and Akbaşlı (2021) also concluded that emergency remote teaching activities realized during the pandemic were not as effective as face-to-face education and problems such as the inadequacy of technological tools in the education process, infrastructural inadequacy, and administrative challenges were confronted. In addition, Qureshi, Khawaja, and Zia (2020) reported that there were problems such as equipment and infrastructure inadequacy in England. Among the reasons why teachers found face-to-face education more effective than emergency remote teaching might be that they have not conducted distance education activities before, and were caught unprepared for the process, and had not received any training on distance education. Of course, when necessary conditions are met, distance education can be as effective as face-to-face education (Lucky, Branham, & Atchison, 2019).

Some teachers believed that there will be no change in SACs after the COVID-19 outbreak but some of them will take health measures, training programs will be prepared concerning distance education or the existing curriculum content will be changed, teachers might be provided with in-service training on distance education and expected establishing an EBA-like infrastructure. In addition, the study concluded that teachers believe that distance education could be used part-time as an alternative practice for students with transportation problems or in urgent situations and in presenting theoretical information or as a technology-supported method. Also, Bozkurt (2020), Maloney and Joshua Kim (2020), and Soeung and Chim (2022) underline the expectations regarding teachers' blended teaching. Cahapay (2020) also suggests that blended learning can be used in education in post-pandemic periods.

Teachers expected to prepare a distance education curriculum for SACs and suggested that distance education could be used part-time in SACs. This expectation might be because of the idea that the significance and impact of distance education activities will increase in the future and become a solution for students who have attendance problems. The fact that distance education has become a necessity today and, in the future (Surma & Krischenner, 2020) supports this finding. As in this research, many study findings show that distance education will be employed more in educational activities after the COVID-19 (Blain, Stange, & Curran, 2022; Carius, 2022; Eringfeld, 2021; Singh, Steele, & Singh, 2021).

For the future of SACs, the teachers participating in the study suggested increasing the number of in-service and distance education training programs delivered

to teachers, increasing interdisciplinary collaborations between teachers from different majors, screening all students and improving the selection process, reducing students' attendance days and workload, enriching ateliers in terms of materials, improving the infrastructure and physical conditions of SACs, turning SACs into full-time schools, reducing the number of students in groups, valuing individualized education, and updating the curriculum. Similarly, other studies also have concluded that SACs face may problems with the inadequacy of equipment and infrastructure (Akbüker, Erdik, Güney, Çimşitoğlu, & Akbüker, 2019; Atlı & Balay, 2016; Elcik & Cıngıllıoglu, 2015; Güneş, 2018; Karakuş, 2010; Kurtdaş, 2012; Sarı & Öğülmüş, 2014;).

These results show that the problems experienced have not been solved. According to the results of this study, one could say that these problems have gained momentum during the COVID-19 outbreak. Studies conducted by Sarı and Öğülmüş (2014), Kurtdaş (2012), and Karakuş (2010) concluded that student absenteeism is another problem in SACs. Elcik and Cıngıllıoglu (2015) and Sarı and Öğülmüş (2014) also concluded that there problems in the student identification process. Moreover, studies conducted by Satmaz and Evin-Gencel (2016) found that teachers working at SACs were provided with an insufficient number of in-service training, and the in-service training provided should be technology-aided. Yet, every country should use the local resources safely, provide internet connection and technological equipment for their schools, and equip teachers with adequate technological equipment (Obana, 2020).

However, the fact that the problems experienced during the COVID-19 process in SACs were also reported in previous studies shows that these problems have remained unsolved for several years. Meanwhile, from the past to the present, in-service training requirements have increased in parallel with the current changes and developments. Can (2020) maintains that the necessary infrastructure, application, and quality aspects related to distance education should be strengthened. In addition, teachers' recommendation of increasing interdisciplinary collaboration for the post-pandemic period is also recommended by Cahapay (2020). The following suggestions were made considering the results of the research:

1. Distance education programs should be prepared for gifted students in SACs.
2. Distance education training concerning the needs that emerged during COVID-19 outbreak could be provided to teachers working in SACs.
3. Distance education could be used to solve the problems of students experiencing attendance issues.
4. The infrastructural problems and material shortages could be resolved in ways that respond the current needs.
5. It could be ensured that differentiated and enriched educational practices in SACs reach the desired level by bringing the infrastructure and material issues to a quality that respond to the current needs.
6. This study was carried out at early periods of the pandemic. Therefore, future studies could address the changes and developments in the field.

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