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Science and Classroom Teachers' Views on Sustainable Environment-Life during Covid-19 Epidemic

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Dila Leylak[*] **Feride Ercan Yalman**[**]

Abstract

This study, conducted with phenomenological design, a qualitative research approach, aimed to determine science and classroom teachers' views on sustainable environment and life during Covid-19 pandemic. For this purpose, data were collected from six science teachers and six classroom teachers working in Mersin city center through semi-structured interview questions. The first section of the interview attempted to identify teachers' views on sustainable environment and life. The second section examined participants' views on Covid-19 outbreak and their experiences during the epidemic. The last section focused on views about the effects of Covid-19 epidemic on sustainable environment and life. The findings were analyzed with content analysis. It was found that the participants defined sustainability as continuity, did not find the state follow-up sufficient in sustainable environmental practices and believed that citizens lacked awareness about sustainability. Some participants reported experiencing a process of returning back to basics and enlightenment during the epidemic. The majority of the participants believed that the epidemic would have a negative impact on sustainability. On the other hand, some participants stated that the epidemic would have positive effects or no effect on sustainability. Participants suggested various solutions for a sustainable environment based on the epidemic experience.

Keywords: Covid-19, sustainability, science teachers, classroom teachers

[*] *Teacher; Hatay Altınözü Yarseli Primary School, Hatay, Turkey. E-mail: dilaleylak@gmail.com, http://orcid.org/0000-0002-5597-2048*

[**] *Corresponding Author:* Assist.Prof. Dr., Mersin University, Faculty of Education, Department of Mathematics and Science Education, Mersin, Turkey. E-mail: feride@mersin.edu.tr, http://orcid.org/0000-0003-1037-1473

Covid-19 Sürecinde Fen ve Sınıf Öğretmenlerinin Sürdürülebilir Çevre ve Yaşam Üzerine Görüşleri

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Dila Leylak[*] **Feride Ercan Yalman**[**]

Öz

Bu çalışmanın amacı, fen bilimleri öğretmenlerinin ve sınıf öğretmenlerinin Covid-19 pandemi sürecinde sürdürülebilir çevre ve yaşama ilişkin görüşlerini tespit etmektir. Nitel araştırma yaklaşımlarından fenomenolojik desene göre tasarlanan çalışmada veriler, yarı yapılandırılmış görüşme soruları aracılığı ile toplanmıştır. Bu amaçla Mersin il merkezinde görev yapmakta olan altı fen bilimleri ve altı sınıf öğretmeni araştırmaya dâhil edilmiştir. Görüşmenin ilk kısmında öğretmenlerin sürdürülebilir çevre ve yaşam ile ilgili düşünceleri tespit edilmeye çalışılmıştır. Görüşmenin ikinci kısmında ise katılımcıların Covid-19 salgını ile ilgili görüşleri, salgın sürecindeki deneyimleri incelenmiştir. Görüşmenin son kısmında ise Covid-19 salgın sürecinin sürdürülebilir çevre ve yaşam üzerinde ne gibi etkileri olacağına dair düşünceleri tespit edilmeye çalışılmıştır. Elde edilen bulgular içerik analizine göre analiz edilmiştir. Katılımcıların sürdürülebilirliği devam etmek olarak tanımladığı, sürdürülebilir çevre uygulamalarında devlet takibini yeterli bulmadığı tespit edilmiştir. Bazı katılımcılar tarafından salgın sürecinde kişisel olarak öze dönme ve aydınlanma dönemi yaşandığı dile getirilmiştir. Araştırmada ortaya çıkan çarpıcı bir sonuç ise salgının sürdürülebilir çevre ve yaşam üzerine etkileridir. Çoğu katılımcı tarafından sürdürülebilirliğe salgının olumsuz etkisi olacağı düşünülmektedir. Buna karşın salgının sürdürülebilirliğe olumlu etkisinin olacağını ya da etki olmayacağını düşünen katılımcılar da mevcuttur. Katılımcıların salgın deneyiminden yola çıkarak sürdürülebilir çevre için çeşitli çözüm önerileri dile getirdiği görülmektedir.

Anahtar Sözcükler: Covid-19, sürdürülebilirlik, fen bilimleri öğretmenleri, sınıf öğretmenleri

[*] *Öğretmen: Hatay Altınözü Yarseli İlkokulu, Hatay, Türkiye. E-posta: dilaleylak@gmail.com, http://orcid.org/0000-0002-5597-2048*

[**] *Sorumlu Yazar:* Dr. Öğr. Üyesi, Mersin Üniversitesi, Eğitim Fakültesi, Matematik ve Fen Bilimleri Eğitimi Bölümü, Mersin, Türkiye. E-posta: feride@mersin.edu.tr, http://orcid.org/0000-0003-1037-1473

Introduction

The Native American saying "*We do not inherit the Earth from our ancestors, we borrow it from our children*" expresses that the Earth is the home of humanity for thousands of years. However, while using the resources of the earth, people do not act with the belief that they are conserving what is entrusted to them, but use this inheritance without thinking of the future. In other words, the world has been subjected to various human interventions for generations (Wamsler, 2020). From this bitter truth, emerges the concept of sustainability (Nousheen et al., 2020) which was first defined in the Brundtland Report prepared by the World Environment and Development Commission in 1987 as "development" that meets today's requirements without compromising the ability to meet the needs of future generations (Brundtland Commission, 1987). Sustainability is defined by Gilman (1992) as the ability of a society and ecosystem to continue functioning in the future without hardship caused by overloading the key resources it depends on. These definitions emphasize that policies on society, economy and environment should be developed together for sustainability (Mahat et al., 2020). Some dilemmas and crises may emerge from time to time while making decisions centered on these three key concepts (society, economy and environment) depending on how economic balance, ecological balance and social well-being are prioritized.

Global problems in sustainability threaten humanity due to increases in fossil fuel use, intensive energy consumption and increased carbon footprint, and most importantly, the unaccounted use of resources. In other words, human beings will be affected the most by the problems caused by the hand of human beings (Aytar & Özsevgeç, 2019). The United Nations has included qualified sustainability education among the 17 global goals by 2030 (United Nations, 2015) because the concept of sustainability is related to education and education is related to the future (Wolff, 2020). For this reason, it is necessary to address sustainability at all levels of the education system, from pre-school to higher education (Göçen, 2021). Many studies in literature state that education plays a key role in ensuring sustainable environment and life (Holfelder, 2019; Wolff, 2020).

In this context, the science course program has great importance for students to gain awareness in sustainability. The specific objectives of the 2018 Science Curriculum include the following: "*To ensure that students grasp the mutual interaction between the individual, the environment and the society; to raise awareness about sustainable development regarding society, economy and natural resources"* (MoNE, 2018). In addition, the science lesson program taught by classroom teachers in primary school 3rd and 4th grades contain acquisitions in regards to sustainable living. For example, the 3rd and 4th grade Science Program includes the following acquisitions respectively: "*offers solutions to protect the natural environment by doing research*" and "*takes special care about using resources*" (MoNE, 2018). As the grades progress, the number of acquisitions in this regard increases and the relevant content is expanded. There are acquisitions related to sustainable environment and life in "Human and Environment Relationship" topic in the 5th grade program, "The Health of Systems" in the 6th grade program and "Domestic Waste and Recycling" in the 7th grade program. At the 8th grade level, "Material Cycles and Environmental Problems" unit includes relevant acquisitions and there is a separate unit titled Sustainable Development (MoNE, 2018). Sustainability education, which is addressed over more than one acquisition each year in the curriculum, is critical. Sustainability education is important in teaching programs and it is predominantly explored in academic studies at all levels, from pre-school to teacher education. In the literature Borg and Prambling-Samuelsson (2019) studied sustainability education in the preschool period, Eames and others (2018) with secondary school students, Yiğitkaya (2019) with prospective teachers, and Güngör (2018) with adults, including administrators and teachers.

Sustainability, which is very important in human life, can be addressed in relation to the Covid-19 outbreak (pandemic), which is on the agenda of the whole world. During this pandemic, the virus spreads rapidly, causing mass deaths in a short time, also affecting different dimensions of life such as social, economic, political, etc. (Budak & Korkmaz, 2020). Experts emphasize the use of masks and hand washing to protect people from the epidemic. Therefore, mask consumption and waste as well as water consumption increases. Hence, it is possible to talk about a multidimensional effect by collecting the environmental effects of the epidemic under the headings of air pollution, CO_2 emissions, wastes, chemicals and social environment. The amount of various chemical substances and the amount of medical waste for the treatment process are increasing day by day with the increase in the use of

disinfectants, the production of disinfectants and vaccine studies undertaken by many countries for the treatment of the disease. On the other hand, consumption has decreased at some areas (fossil fuels etc.) due to the slowdown in social life and tourism. Muhammed, Long and Salman (2020) stated that the environment breathed a sigh of relief caused by reduced consumption during the Covid-19 epidemic, albeit temporarily. At this point, it is important to consider how these events, which developed with the Covid-19 outbreak, will affect development approaches in terms of sustainability.

Sustainability and Covid-19 epidemic are the key concepts in this study. Relevant studies on sustainability in literature are often conducted with teacher candidates to examine their knowledge, attitudes and views on sustainable environment (Andersson, 2017; Becker, 2018; Nousheen et al., 2020). Studies in literature examining the issues related to education during the Covid-19 epidemic are generally associated with distance learning (Akbulut, et al., 2020; Onyema et al., 2020; Reiss, 2020; Uşak et al., 2020). However, the number of studies that address Covid-19 and sustainability together is rather limited (Muhammed et al., 2020; Wolff, 2020). Hence, the present study is believed to contribute to the literature. Teachers have an important role in raising awareness about sustainability (Huckle & Wals, 2015). Teachers' views on sustainable environment during and after the Covid-19 process are believed to have an effect on their students. For this reason, science and classroom teachers, with important roles in sustainability education, were included in this research which examined their views on sustainable environment and life during the Covid-19 epidemic. The significance of the training, curricula and teachers is mentioned above. However, when we consider the specific impact of classroom teachers on children and the fact that the first seeds are planted in primary school years in raising environmental awareness, it becomes crucial to work with classroom teachers and to identify their views on sustainability. While sustainability is a multidisciplinary concept, it can be argued that science teachers address the issue of sustainability in their classes most extensively. From this point of view, it is believed that identifying science teachers' views about sustainability is important. Hence, classroom teachers and science teachers were included in this research, and the research questions were developed in this direction.

In this context, the following research questions were sought in the research:

1) What are the views of science and classroom teachers on sustainable environment and life?
2) What are the views of science and classroom teachers about the Covid-19 process?
3) What are the opinions of science and classroom teachers about the effects of the Covid-19 process on sustainable life?

Method

This research was designed with a phenomenological design, one of the qualitative research methods, used to determine how participants attribute a meaning to the concept examined and how orientations are formed according to perceptions and experiences (Miller, 2003). This study attempted to discover science and classroom teachers' views on sustainable environment and life, their experiences during the Covid-19 epidemic and the effects of this process on sustainability. For this reason, phenomenological design was preferred in this study.

Study Group

The study group of this research consisted of science and classroom teachers. Convenience sampling, a purposeful sampling method, was used for the interviews conducted within the scope of the research. A total of 12 teachers (6 science, 6 classroom) were involved in the research process. The interviews continued until the codes and patterns obtained from participants began to repeat themselves (saturation point). As new data were not obtained after the 12^{th} participant, it was decided by the researchers not to increase the number of participants and therefore the number of participants was limited with 12. Table 1 presents participants' information.

Table 1

Participant Information

Participant No	Field of Study/Branch	Gender	Seniority
1	Science teacher	Male	1 year
2	Science teacher	Female	5 years
3	Science teacher	Female	15 years
4	Science teacher	Male	7 years
5	Science teacher	Female	12 years
6	Science teacher	Male	6 years
7	Classroom Teacher	Male	19 years
8	Classroom Teacher	Female	2 years
9	Classroom Teacher	Female	9 years
10	Classroom Teacher	Male	7 years
11	Classroom Teacher	Male	4 years
12	Classroom Teacher	Female	20 years

According to Table 1, the number of science and classroom teachers was equal (6). There were six female and six male teachers in the study group. The professional seniority of teachers (years in the profession) varied between 1 and 20 years. Considering all demographic information, it can be argued that the study group had a heterogeneous structure.

Instrument

A semi-structured interview form with eight questions was prepared to collect research data. It was ensured that the questions were clear and understandable, and they served the purpose. The order and type of questions were carefully selected to ensure eliciting elicit various responses, without limiting teachers. To provide these qualities, the draft interview form was checked by two experts in the field of science education and primary education. Then a pilot implementation was performed with a classroom teacher to check the functionality of the questions. Later, the form was finalized. Interview questions are presented below:

1) In your opinion, what does the concept of sustainability mean?
2) Do you keep track of the current state practices regarding sustainable environment? Can you provide some examples?
3) How do you evaluate state practices regarding sustainable environment?
4) What kind of practices can be implemented to positively contribute to citizens' sustainability awareness?
5) How do you evaluate the Covid 19 process for yourself?
6) How do you evaluate the Covid 19 process for the world?
7) In your opinion, what effect does Covid 19 have on sustainable life?
8) If you were the Minister of Environment in Turkey, what kind of practices would you implement for a sustainable life after the Covid 19 process?

Implementation Process

Research data were collected from the participating teachers working in Mersin city center in the spring term of 2021 (during the epidemic). Appointments were made with the 12 teachers participating in the study and online video interviews were conducted to abide by the social distancing criteria during the epidemic process. The interviews were conducted over Zoom and Google Meet according to preference; videos were not recorded. The interviews, lasting between 15-20 minutes on average, were recorded using an audio recorder with participants' consent. According to Yıldırım and Şimşek (2016), the duration, depth and participant characteristics affect the interview process. A suitable interview climate was tried to be created by paying attention to these factors, and the participants were given sufficient time to express themselves freely.

Data Analysis

Participants' recorded interviews were transcribed. Qualitative data were analyzed by content analysis, performed by classifying similar data obtained from the research under codes and themes (Yıldırım & Şimşek, 2016). During the analysis process, the consistency of the coding obtained by the researchers was examined. Concept maps obtained from codes and themes are provided in the findings section.

Validity, Reliability and Research Ethics

First of all, expert opinion was sought in the preparation and analysis of the questions to ensure validity and reliability While preparing the interview questions, two faculty members (one from the science teaching department and one from the classroom teaching department) who are experts in the field of qualitative research were involved in the process and contributed to the process by sharing their views. As the second step, a pilot implementation was conducted to test the functionality of the questions. As the third step, participants' statements in the interview were not changed or interpreted in the analysis phase and no statements were used except for the data obtained from participants. In order to avoid possible misunderstandings, participants were contacted once again for confirmation. As the fourth step, two researchers took part in the analysis process. The reliability formula suggested by Miles and Huberman (1994) (Reliability = Consensus / (Agreement + Disagreement) was used to test agreement which was calculated as .80 during data analysis. The literature considers it sufficient when the percentage of agreement between coders is 70% or more (Miles & Huberman, 1994). In this context, reliability was provided in data analysis. In order to ensure transferability in the research, attention was paid to describe both the implementation phase and the reporting phase as clearly as possible. In order to ensure credibility, sections from participant views were presented in the findings section as quotations.

Ethical approval was obtained from Mersin University Social Sciences Ethics Committee for this research to ensure ethical conditions were met. Before the interviews, participants were informed about confidentiality and privacy. The research was carried out by voluntary participation. In order to ensure privacy and confidentiality, codes were used rather than the names of the participants based on teachers' branches such as Science Teacher 1 (ST1), Classroom Teacher 1 (CT1) etc.

Results

First of all, participants' definitions on sustainability were examined. Figure 1 presents teachers' responses.

Figure 1. *Teachers' Definitions for the Concept of Sustainability*

According to Figure 1, six participansts used the verb "to continue" while defining sustainability. Three participants defined the concept of sustainability as "thinking of future generations". Some participant statements are presented below.

> *We call it sustainable life when it is ensured that people can continue their lives without reducing the quality of their lives and can meet their needs by taking the future generations into account. (ST3)*

The participants were asked whether they followed state practices regarding sustainable environment, and if so, how they evaluated these practices. Figure 2 presents the results.

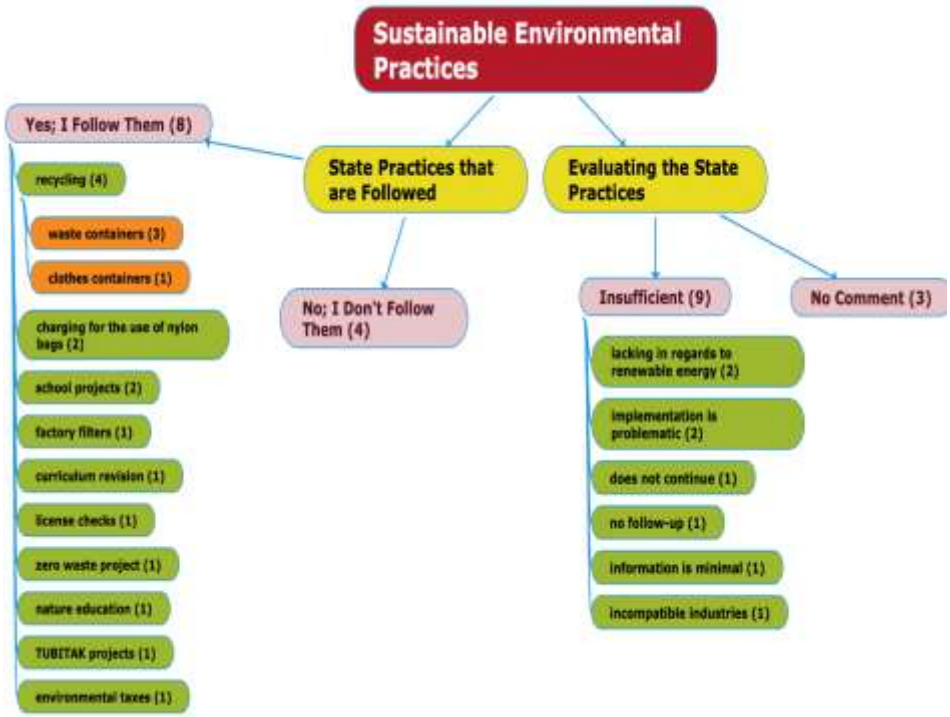

Figure 2. *Following and Evaluating State's Sustainable Environmental Practices*

In Figure 2, four participants stated that they did not follow state's sustainable environmental practices while the other eight participants stated that they followed some of these practices. The practices given as examples often included the themes of "environmental projects in schools, recycling bins provided by the state and charging for the use of plastic bags". The views of S2 are presented below.

> *Since I'm a teacher, I can give examples of the practices at school. Recycling is more emphasized at schools. Battery recycle boxes, separate battery and plastic recycle boxes are sent to schools by municipalities. (ST2)*

As Figure 2 shows, three participants did not comment on this issue and nine participants found these practices insufficient. They found the implementation processes problematic and stated that renewable energy sources could be used more. They thought that the implementations should be followed up and their continuity needed to be ensured. Some participant views are presented below.

> *It is not enough when we look at the society. Because, at this point, it is important to raise awareness in the society. I do not find it sufficient. I also think there is a lack of control in regards to recycling. (CT3)*

Teachers were asked about the kind of practices the state can implement to contribute to citizens' awareness. Table 2 presents the findings.

Table 2

State Practices for Sustainability

Themes	Codes
Practices That Can Be Implemented By State To Contribute To Citizens' Awareness of Sustainability	Informative family trainings (6) Practices to save/to economize (1) Increasing the bans (1) Establishing citizenship awareness (1) Initiating financial incentives (1) Facilitating access to recycling facilities (1)

Based on the findings presented in Table 2, the participants believed that, in general, citizens lacked knowledge on this subject and trainings should be provided to give information and raise awareness. Teachers' responses focused on the students and their parents, stating the need for informative training for families. Other responses emphasized increasing bans, the practices on saving and increasing renewable energy use. Excerpts from the interview are presented below.

> *First of all, the state should implement practices to be economical in order for citizens to understand. The state must take drastic measures to use renewable energy. (ST2)*

> *It is very important to raise students' awareness; we can ask them to raise awareness of their families and to do activities with them. For example, they can watch a documentary with their families and then comment on it. (CT3)*

The first four questions of the interview focused on participants' perceptions on sustainability, knowledge level about state's sustainable environment practices and suggestions about raising awareness for sustainability. These questions were followed by questions on Covid-19.

The participants were asked how they evaluated the epidemic process for their personal lives and for the world. Then, they were probed about the state practices on the pandemic. Figure 3 provides the results

Figure 3. *Evaluation of Covid-19 Epidemic*

According to the results in Figure 3, participants expressed both positive and negative personal effects of the epidemic. In general, five sub-themes were identified under the positive effects theme and three sub-themes were found under the negative effects theme. The sub-themes of "returning to self, global perspective, awareness, personal development and commitment within families" were included as positive effects. "Uncertainty, becoming isolated and technology fatigue" were included as negative effects. Some of the participant views are presented below.

> *During this period, I watched the movies and read the books I wanted to watch and read. I tried to improve myself. I can say that I turned to my inner self, back to my core" (CT1)*

> *It affected me, my children and my family negatively. We have been negatively affected in regards to social life, education and health. (ST4)*

According to participants, the epidemic affected the world both positively and negatively. Three sub-themes were identified under the positive effects theme and six sub-themes were found under the negative effects theme. Participants cited "appreciation, acquiring awareness and cleansing of the nature" as positive effects. The appreciation sub-theme was expressed with the following codes: "appreciating education, environment, people, professions, natural life". The negative effects were expressed with "education problems, causing the process of collapse, leading to consumption, causing economic depression, becoming selfish and the process being the world's reaction to human beings". Some of the quotes from teacher interviews are below.

> *There was a perception in the world that we can treat nature as we want and consume unlimitedly. We thought that we could control the nature but we saw that this would not be the case. (ST6)*

The participants were asked the impact the Covid-19 epidemic on sustainability. Figure 4 presents the results.

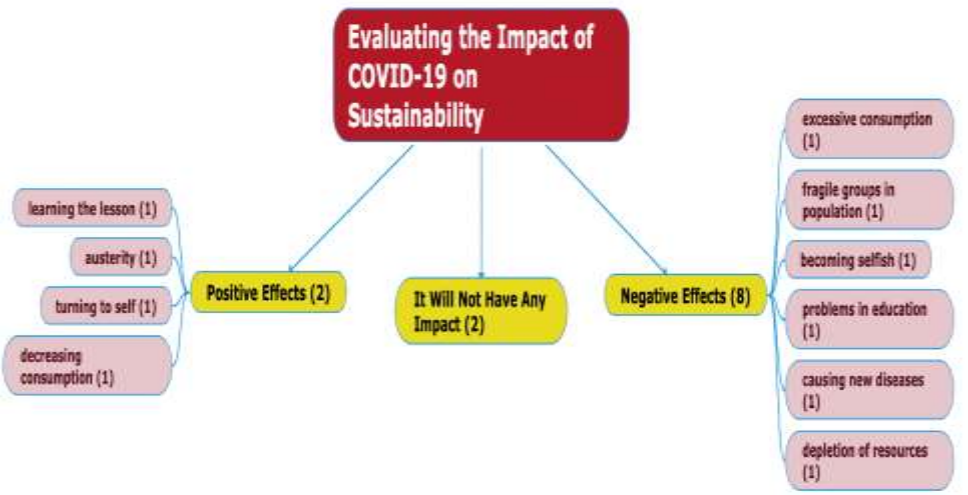

Figure 4. *The Impact of Covid-19 on Sustainability*

Examination of the results in Figure 4 points that eight participants reported that sustainable life was negatively affected by this process. Some participants cited "depletion of resources, causing excessive consumption, becoming selfish, causing new diseases, causing problems in education, creating fragile groups in population". Two participants reported positive effects on sustainable life because people returned to their inner selves by learning their lessons and reduced consumption. The other two participants stated that the process would not have any impact on sustainability, either positively or negatively.

> *I think it will negatively affect sustainable life because people are focused on consumption. I have friends who are shopping like crazy thinking that it is not clear when they will die. Some of them suffer from germophobe and use an incredible amount of water and cleaning materials. (CT5)*

> *I think it will cause us to give up the consumption frenzy. For this reason, I think it will make a difference in terms of sustainability. (ST2)*

The epidemic will not have a huge impact on sustainability. People do not care about nature and the environment, but think about their own interests. (ST5)

Participants were asked what they could do for a sustainable life after the Covid-19 outbreak if they were the Minister of Environment. Figure 5 presents teachers' responses.

Figure 5. *Projects That They Can Implement as the Minister of Environment After Covid-19*

According to the findings in Figure 5, seven participants stated that they could implement afforestation. Other ideas included "education projects in schools in cooperation with MoNE, family training, public service announcements, cooperation with the scientific board, informative seminars, increasing recycling practices, realizing urbanization projects in accord with nature by changing the urban structure, water resources conservation projects, projects to provide air cleaning and encourage the use of bicycles".

I would prioritize children's education. If I were the Minister of Environment, I would hold seminars on landscaping. I would cooperate with the Ministry of Education. (ST4)

I would draw attention to the damage caused by the increased water consumption and the use of chemical-containing disinfectants after Covid-19 regarding environmental protection. I would implement school projects that give importance to the ecosystem and support these projects with family trainings. (CT3)

Discussion, Conclusion and Recommendations

This study investigated the views of science and classroom teachers on sustainable environment and life during the Covid-19 epidemic.

The general overview of the research results suggests the participants were generally aware of the concept of sustainability. Participants who partially followed the state practices within the scope of sustainability were found to be familiar with the projects and practices carried out in schools. The research results regarding the Covid-19 epidemic process show that the participants believed that the epidemic had both positive and negative effects, both in personal terms and in regards to the world community. The participants listed *increasing people's awareness, returning to one's self, appreciating life and natural resources, and cleansing the nature* among the positive effects of the epidemic. Also, *individualization, consumption frenzy, problems in education and economy* were expressed as negative aspects of the epidemic. The participants, who discussed the impact of the epidemic process on sustainability, generally expressed negative opinions. Some participants believed that the epidemic process negatively affected sustainable life by causing reduction of resources due to excessive consumption and selfishness. Following the general summary of the research results, the findings are discussed below by providing analyzes according to the sub-dimensions.

The first dimension of the research focused on perceptions of and definitions for sustainable environment. The participants defined sustainability with expressions such as continuity, thinking about future generations, improving opportunities and environmental awareness. In Bulut and Çakmak' (2018) studies, sustainability was also defined with expressions such as the conscious use of resources, possibility of leaving a better world to future generations and the opportunity to improve the living conditions of people living in difficult conditions. Similar key concepts were also used in Gilman's

(1992) definitions. In this context, it was concluded that participants' definitions were compatible with the definitions in literature. This finding may be related to the fact that participants were teachers and had relevant domain knowledge. That the participants partially followed the state practices regarding sustainable environment was one of the striking results. Participants were found to have information mostly about recycling and in-school projects. The participants who followed the state practices criticized the sustainability practices and found them insufficient. At this point, the lack of interest on the part of teachers to follow sustainability practices may need to be examined before criticizing state practices. It can be emphasized that teachers should be trained before the masses can be trained. Gkargkavouzi, Halkos and Matsiori (2018) found that the teachers had a positive attitude towards environmental issues, but their level of knowledge was partial. Andersson (2017) stated that sustainability trainings given to teachers were effective and served the purpose, recommending this type of training for teachers instead of studying their knowledge and competencies. Raising public awareness is as important as teacher training for a sustainable environment.

The second dimension of the research attempted to examine the effects of the Covid-19 process in its entirety. Both positive and negative statements were encountered in the participants' evaluation of the epidemic for their personal lives. Positive responses included making an effort to improve themselves, going through a process of turning to their inner selves and developing the bonds with their families in the quarantines. Öztürk and others (2020) also stated that individuals were affected both positively and negatively from the epidemic, supporting the outcome of this study. They reported that as a result of the measures, people turned to their inner worlds and the time they spent with their families increased compared to the past, citing the positive effects of the epidemic in personal and affective terms.

Striking results were obtained in the third dimension of the study which associated participants' sustainability perceptions with the Covid-19 epidemic. The participants stated that the epidemic could have positive effects for the world. They interpreted the epidemic as the Earth's reaction and message and reported beliefs that humanity would receive this message and experience awareness. Parallel views were also included in study of Çobanoğlu's (2020) who stated that Covid-19 is a warning for people to re-evaluate their priorities in today's world where resources are rapidly depleted. Aydın and Dogan (2020) also predicted that the epidemic would cause permanent changes in individuals' consumption behavior. However, some participants argued that the epidemic process triggered selfishness and consumption frenzy. This finding was also identified in the research conducted by Erişen and Yılmaz (2020) for the expenditures of individuals during the Covid-19 epidemic, concluding that the epidemic caused an increase in expenditures. The participants often used positive expressions regarding the effects of the epidemic on themselves but used more negative expressions about the effects of the epidemic on the world. This finding parallels the statement of Yıldırım (2020) that the social anxiety caused by the epidemic was much more than personal concerns. Participants believed that the Covid-19 outbreak would affect sustainable life both positively and negatively. Some studies in literature examining the effects of the epidemic on sustainable living (El Zowalaty et al., 2020; Eroğlu, 2020) also mentioned both positive and negative effects. However, the view that the epidemic process would not have an impact on sustainable living also came up in the interviews in the present research. This finding was also identified in the studies of Kumar and Tyagi (2021) and Saadat and others (2020) which support the statements that the effects of the Covid-19 epidemic would not last very long in the world and that people's behavior patterns would be like before. Participants recommended some projects for sustainable life after the epidemic, mostly focusing on afforestation, informative trainings and family trainings in their project proposals. Changing the urban structure and encouraging the use of bicycles were among the project proposals. Teachers' suggestions for the state to develop citizens' sustainable environment awareness and participants' project proposals for sustainable life after Covid-19 were parallel. In the light of these results, some suggestions are provided.

1) The participants were competent in their definitions of sustainability but they partially followed the practices related to sustainability. Considering that even the teachers, the pioneers of education, do not fully follow the sustainability practices, it can be argued that the state should take remarkable and striking actions as much as possible. It may be recommended to implement campaigns, public announcements, etc. or to enact relevant laws and regulations to raise awareness. Based on the reality that "*Only what is loved is protected and what is known is loved*", various affective practices can be

organized for both adults and children as an alternative so that improvements can be ensured regarding the concept of sustainability.

2) It can be recommended to carry out studies after the epidemic to explore sustainability from different angles.

3) Program developers may be advised by MoNE to add acquisitions that address Covid-19 and sustainable environment in conjunction in the Science course curriculum.

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