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Prospective Classroom Teachers' Views on Out-of-School Learning Activities Before and During the Covid-19 Outbreak

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ABSTRACT

In the study, the aim was to examine the views of prospective classroom teachers regarding their activities in out-of-school learning environments in face-to-face education before the Covid-19 outbreak and in distance education during the outbreak. The research was carried out in a phenomenological design with 26 prospective classroom teachers. The data were collected with the "Out of School Learning Environments Interview Form". Thematic analysis was used to analyze the data. The opinions of the prospective teachers were examined under the themes of "teaching process", "teacher activities" and "application". Based on the findings obtained within the scope of the research, while the prospective teachers emphasized experiential learning in pre-pandemic practices, they drew attention to the variety of environments in activities during the pandemic. Participants stated that they assume the roles of guiding and transmitting information in learning environments. In planning the activities, they attach importance to the compatibility of the environment with the subject/objectives. In addition, the majority of prospective teachers stated that the practices carried out before the pandemic were applicable. In the research, it is suggested to use out-of-school learning environments with a good planning in line with the aims and possibilities.

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Introduction

Advances in science and technology are increasing day by day and their effects are seen in all areas of life. However, science disciplines that have a share in this change and development process, which we feel so much influence in our daily life and see tangibly in technological tools, do not receive enough attention and student attitudes towards school science tend to decrease (Braund & Reiss, 2006; Osborne & Collins, 2001). With a somewhat assertive statement, young people are alienated from science disciplines (Osborne et al., 2003). For this, it is emphasized that attention should be paid to the quality of teaching and the interesting aspects of science teaching should be focused on. In recent decades, science educators in many countries have emphasized the efficiency of teaching-learning processes (Kurnaz et al., 2016) and expressed concern that the current teaching and contents in schools

are boring, irrelevant, and outdated (Braund & Reiss, 2006). Thus, problems arise regarding the content of a quality science education and how to perform it.

Although science education can be carried out in the classroom, laboratory, and outdoors, the school/classroom is seen as almost the only learning area in individuals' minds. However, learning also takes place in social and cultural contexts offered outside of school (Aikenhead, 2005; Osborne et al., 2003), and there is a potential for science learning in these environments (National Research Council [NRC], 2009). Indeed, new technologies and advances have been effectively used in learning processes in out-of-school settings (e.g. science museums, applied centers, zoos, botanical gardens, natural history parks, geological sites, zoos, industrial areas, nature, etc.) (e.g. Andrews & Yee, 2006; Demirel & Özcan, 2020; Godin & Gingras, 2000; Han, 2020; Harron et al., 2019; Popli, 1999). So, for science learning, learning that takes place outside of school should be considered as well. However, there is no clear explanation about the definition of out-of-school learning in the literature. The reason for this is that such learning can take place in many environments mentioned above (Hofstein & Rosenfeld, 1996). There are also differences in naming. It is seen that names such as "out-of-school", "free-choice learning", "lifelong science learning", "public understanding of science" are used for this learning in the literature (Dierking et al., 2003). For this research, the concept of "out-of-school" was used.

Payne (1985) states that the real world is not a world of blackboards and textbooks, but the world just outside the classroom door. In parallel, the primary purpose of science education is to connect the information learned at school with daily life and to transfer this knowledge to life (Cajas, 1999). There are many opportunities in out-of-school settings for this purpose, and students get the opportunity to experience these opportunities firsthand (Carrier, 2009). However, these contexts are neglected by teachers, program developers, and researchers (Orion & Hofstein, 1994) whereas Wellington (1990) stated that science has little resemblance to the natural world as it is presented at school. Wellington (1990) stated that science bears little resemblance to the natural world as it is presented at school. According to Wellington (1990), there is enough science in "playgrounds, kitchens, sports fields, and golf courses, shop windows, backyards or dumps" for a lifetime of research. Science education can be carried out more effectively in the aforementioned contexts with more experiential learning (Association for Experiential Education, 2008) apart from the "cookbook" logic (Šorgo & Kocijančič, 2011). This situation makes out-of-school learning activities a valuable part of the teaching process. The importance of out-of-school learning environments in the literature has been confirmed by numerous studies, some of which are given below.

In the studies where out-of-school learning activities were carried out, the characteristics of the participants such as attitudes towards science (Öztürk & Başbay, 2017; Ürey & Çepni, 2014), attitudes towards the environment (Ballantyne & Packer, 2002; Erentay, 2013), motivations (Hagger & Hamilton, 2018; Sturm & Bogner, 2010), perceptions of nature (Aaron, 2009; Birinci, 2013; Yardımcı, 2009), scientific process skills (Erentay, 2013; Erten & Taşçı, 2016; Öztürk & Başbay, 2017; Vebrianto & Osman, 2011), achievements (Blair, 2009; Erentay, 2013; Türk & Kalkan, 2015; Wünschmann et al., 2017; Türkmen et al., 2016; Vebrianto & Osman, 2011; Yavuz, 2012), and anxieties (Yavuz, 2012) were examined. The long-term effects of out-of-school learning environments have also been demonstrated in studies (Farmer et al., 2007). Therefore, it would be beneficial for science educators to consciously use out-of-school learning environments that promote science learning (NRC, 2009).

There are also studies in the literature in which the opinions of teachers and prospective teachers regarding the use of out-of-school learning environments are obtained. Teachers and prospective teachers think that out-of-school learning environments are effective in experiential learning (Dönel Akgül & Arabacı, 2020; Goksu & Somen, 2018; Kubat, 2018; Mertoğlu, 2019; Tatar & Bağrıyanık, 2012; Selanik Ay & Erbasan, 2016), permanent learning (Bostan Sarıoğlu & Küçüközer, 2017; Mertoğlu, 2019; Selanik Ay & Erbasan, 2016), promoting interest, desire, and curiosity (Tatar & Bağrıyanık, 2012, Selanik Ay, & Erbasan, 2016), socialization (Selanik Ay & Erbasan, 2016; Soyly & Karamustafaoğlu, 2020), and raising science literate individuals (Çiçek & Saraç, 2017). Studies in the literature show that students have effective experiences in an out-of-school learning environment, have

advantages in gaining questioning and scientific process skills (Ay et al., 2015), as well as these environments, are entertaining learning environments (Sontay et al., 2016).

It is important to note that besides the advantages of out-of-school learning there are also arguments against it. Out-of-school learning also has difficulties such as the lack of time due to the concern that the subjects in the curriculum will not be completed on time, security regulations, economic factors such as responsibility problems and transportation costs (Kubat, 2018; Rickinson et al., 2004; Selanik Ay & Erbasan, 2016; Türkmen, 2015), leave processes, staff support, weather conditions, students' unfamiliarity, harmful websites (Selanik Ay & Erbasan, 2016), and nutrition (Çiçek & Saraç, 2017). In addition, out-of-school learning environments can be a source of fear and anxiety for students (Simmons, 1994). Students expressed their concerns such as snakes, insects, encountering various animals and plants in these environments, and fear of getting lost. The important point here is that these fears, anxieties, and anxieties create barriers to learning (Bixler et al., 1994). Nature can be perceived by students as something scary (Rickinson et al., 2004). Out-of-school learning environments can also cause some problems for students with special needs (Healey et al., 2001). For teaching practices to be effective, fieldwork must be carefully planned, carefully implemented, and followed up at school. When planning activities, teachers and outdoor educators should take into account factors such as students' fears and phobias, previous experiences, and preferred learning styles (Dillon et al., 2006). They should be adequately prepared for out-of-school learning practices (Griffin & Symington, 1997; Storksdieck, 2001). For this, teacher education has an important role in organizing out-of-school learning environments. It is thought that prospective teachers who gain experience in these practices in education faculties will reflect these experiences to their teaching lives. At the same time, these experiences will contribute to preparing them to be effective teachers by combining theory and practice (Darling Hammond, 2017).

Recently, it has become inevitable to discuss compulsory out-of-school learning while discussing optional out-of-school learning within the school process. During breaks in face-to-face education due to natural disasters such as floods, earthquakes, adverse weather conditions, epidemics, etc., educators should take remote learning out of school on the agenda. As a matter of fact, the COVID-19 disease emerged in Wuhan, China, and affected the whole world in a short time. A pandemic was declared by the World Health Organization (WHO) and a global struggle started. Governments have also taken certain measures to combat this epidemic. Many governments have temporarily suspended face-to-face education in educational institutions to contain the spread of the COVID-19 outbreak. With the interruption of face-to-face education, more than 90% of the world's student population has been out of school (UNESCO, 2020). Thus, different searches were made for the regulation of learning environments. The face-to-face practices were transferred to online environments and the adaptation process of prospective teachers started (Assunção Flores & Gago, 2020). Similarly, out-of-school learning environments have been transferred to the virtual environment via the Internet. Thus, virtual learning environments, which have positive aspects such as saving time, being economical, not requiring procedures, not having environmental limitations (Turan, 2015), eliminating potential risks (Dolphin et al., 2019), and even recommended to be used in distance education (Çolak, 2006) were put into practice. Virtual learning environments offer students the opportunity for independent learning (Cheng & Tsai, 2019). However, nowadays, it has become possible for online learners and those with physical disabilities to participate in virtual out-of-school learning environments (Klippel et al., 2020).

Although limitations and restrictions in traditional out-of-school learning settings have been discussed above, there are also limitations and restrictions for virtual learning environments, including students' skills for and access to appropriate technology and equipment. To utilize virtual learning environments effectively, students must have sufficient skills in using specific technology interfaces. In addition, teachers and students may have problems accessing necessary technology and equipment (Kenna & Potter, 2018). Teachers may also need additional training in turning virtual learning environments into an advantage (Barbour & Harrison, 2016).

In this study, prospective classroom teachers were enabled to spend their learning experiences out of school. In the research process, prospective teachers designed an out-of-school learning

environment by choosing the curriculum outcome (s) like a teacher on duty. For this draft, the prospective teachers prepared a worksheet and carried out the application with their classmates in the chosen environment. Prospective teachers have been in out-of-school learning environments both face-to-face and in virtual environments, prepared and applied activities. They had the opportunity to compare the practices before the pandemic was announced due to the COVID-19 disease with the activities carried out through Internet-based virtual trips during the pandemic. Through the applications carried out during the pandemic, the prospective teachers had an experience in science teaching in virtual walkable environments. In the study, the opinions of the prospective teachers were taken in order to both give feedback about the process and guide the out-of-school learning practices carried out in virtual environments. From this point of view, the study aimed to examine the opinions of prospective classroom teachers regarding their practices in out-of-school learning environments before and during the epidemic.

Method

The research was carried out in a phenomenological design. Phenomenology research focuses on participants' experiences of a phenomenon or program (Creswell, 2014; Merriam, 2009). Data obtained from phenomenological studies include primary life experiences and provide an opportunity to gain in-depth meaning of the participants' experiences in the process (Moustakas, 1994). In the present study, the experiences of prospective classroom teachers in face-to-face and pandemic virtual out-of-school learning environments were discussed. Views of prospective classroom teachers on these experiences were analyzed.

Study Group

The study group of the research consists of 26 prospective classroom teachers, consisting of 20 females and 6 males, taking the Science and Technology Teaching II course. Criterion sampling was used in the study. In this sampling method, some situations meet a set of criteria determined (Yıldırım & Şimşek, 2006). In the current study, the criteria of experiencing out-of-school learning environments before and during the epidemic within the scope of the Science and Technology II Teaching course were determined as criteria. The prospective classroom teachers who met these were included in the study.

Data Collection Tool

Interviews and observations are used as data collection tools in the phenomenology design (Merriam, 2009). The data in the study were collected using the "Out-of-School Learning Environments Interview Form" developed by the researchers. The interview form was created by scanning the relevant literature (Çiçek & Saraç, 2017; Kubat, 2018; Ocak & Korkmaz, 2018; Storksdieck, 2001) in line with the views of two faculty members and a language expert who have studies on out-of-school learning environments at the focus of the research. There are nine questions in the form. The questions are about the strengths and weaknesses of activities in out-of-school learning environments, the comparison of these aspects before and during the pandemic, the points to be taken into consideration in the planning process, the roles undertaken as a teacher in the teaching process, the comparison of the roles assumed before and during the pandemic, the difficulties encountered, the transfer of pre-pandemic practices to teaching environments.

Process

The research was conducted within the scope of the Science and Technology Teaching II course. First, education was carried out with prospective teachers about preparing worksheets in line with the objectives. In this process, sample worksheets prepared to be carried out in an out-of-school learning

environment for the objectives are shown. Later, prospective teachers prepared a worksheet with activities to be carried out in out-of-school learning environments for the objectives in the science curriculum. They ensured that the activities in this worksheet were carried out as a teacher with their classmates. During the course, implementations were carried out in Disaster and Emergency Management Presidency, Archeology Museum, Traffic Education Track. However, with the Covid-19 outbreak, distance education was introduced and activities in out-of-school learning environments were carried out through virtual trips. During the epidemic, activities were held in Göbeklitepe, Konya Science Center, Sazova Park, Toy Museum, Turkish and Islamic Arts Museum. The stages were carried out in the same way both before and during the epidemic.

Data Analysis

The data obtained from the "Out-of-School Learning Environments Interview Form" was analyzed thematically (Braun & Clarke, 2012). First, the written data in the interview form were read in a holistic manner. Afterward, the prospective teachers' answers both as observers and participants during the activities of other prospective teachers, based on their own experiences, were analyzed. During the analysis, the prospective teachers' opinions were read in detail, coding was carried out, and potential main and sub-themes were determined. This process was done by two researchers separately. As a result of the procedures, the consistency between researchers was calculated with the reliability formula of Miles and Huberman (1994) and was found as .86. Since the reliability calculations above 70% are considered reliable for that research, it can be said that the analyzes conducted within the scope of the study are sufficient and reliable. Then, the themes were named via a consensus for the differences between the researchers. Finally, themes were defined. The themes determined in the research are the teaching process, teacher activities, and application.

The prospective teachers' opinions on the theme of the "teaching process" were discussed in two different frameworks. First, the strengths and weaknesses of out-of-school learning environments were examined in general. Afterward, the strengths and weaknesses of out-of-school learning activities conducted before and during the pandemic were analyzed comparatively.

Two different processes were followed in the analysis of the prospective teachers' opinions regarding the activities carried out under the theme of "teacher activities". First of all, where they paid attention to while planning out-of-school learning activities and what roles they undertook as teachers were examined. Afterward, a comparison of these situations before and during the pandemic was made.

In the "application" theme, the prospective teachers' opinions about the implementation of out-of-school learning environment activities are discussed under two general headings. First of all, the difficulties they encountered during their activities were examined. Then, the prospective teachers' opinions about the applicability of the activities performed before and during the pandemic in their classrooms to future settings were analyzed separately.

Frequency values were determined and visualized by combining these themes, sub-themes, and similar opinions of the prospective teachers. In the frequency values, the statements of the participants were classified under separate headings in case of containing more than one opinion. In addition, the data in the study were supported by direct quotations with the expressions of the participants.

Findings

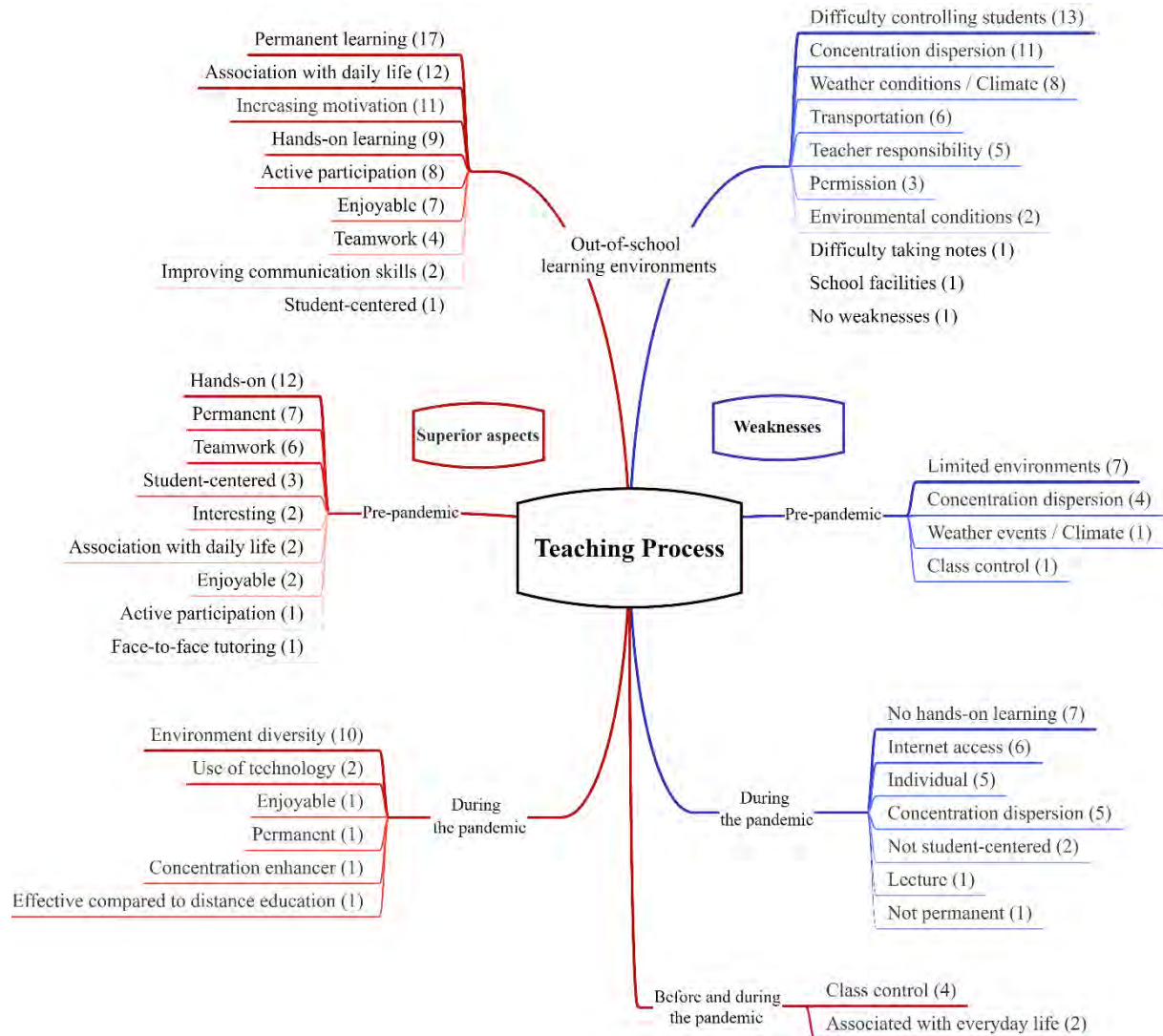
As a result of the analysis of the data obtained from prospective classroom teachers within the scope of the research conducted, their views on teaching processes in out-of-school learning environments before and during the pandemic were examined under three themes: "teaching process", "teacher activities" and "application".

In the theme of "teaching process" regarding out-of-school learning environments, the opinions of prospective teachers were classified under sub-themes of the superior aspects, weaknesses of these

environments, and the comparison of their practices before and during the pandemic in terms of their superior aspects and weaknesses. These classifications are in Figure 1.

Figure 1

Prospective Teachers' Views on the Teaching Process in Out-Of-School Learning Environments.



As seen in Figure 1, under the sub-theme of "superior aspects" of the "teaching process" theme, views of the teaching process carried out in out-of-school learning environments provide permanent learning, offers opportunities to associate the acquired knowledge with daily life, and increases students' motivation, are stated more often by prospective teachers. Examples of prospective teachers' opinions stating that out-of-school learning environments provide opportunities for permanent learning (PT15) and associating with daily life (PT25) are presented below.

PT15: "Out-of-school learning activities provide a more open environment for students to observe one-to-one. By observing the concept of fossil beyond the definition in the book, a student going to the archeology museum actually learns the fossil better and the permanence of the knowledge increases."

PT25: "It provides learning by connecting the subject with the daily life. The areas where the course is taught are those used in daily life."

In the "weaknesses" sub-theme of this theme, prospective teachers stated that it would be difficult to control students in out-of-school learning environments and their concentration could be dispersed. They also stated that factors such as weather conditions/climate, transportation,

environmental conditions, and school facilities prevent teaching activities in out-of-school learning environments. Below are examples of prospective teachers' opinions, who express the weaknesses of out-of-school learning environments as difficulty in controlling students (PT5) and weather conditions/climate (PT9).

PT5: "It may be more difficult to keep students in order because of their energy ..."

PT9: "I think that obvious weaknesses in out-of-school learning may vary depending on the opportunities and the location. ... If I want to do an out-of-school learning activity, the climate and weather conditions may hinder me."

In the sub-theme of "weaknesses" of out-of-school learning environments, only one prospective teacher stated that these teaching activities had no weaknesses. The opinion of the prospective teacher is given below.

PT6: "I do not see any weaknesses, as I find out-of-school learning environments to be fun, at the same time very effective and instructive."

In the "Comparison" sub-theme, the opinions of the prospective teachers about comparing the strengths and weaknesses of their activities before and during the pandemic were classified. Prospective teachers stated that the superior aspects of pre-pandemic practices are that they offer learning opportunities by doing the most, providing permanent learning, and allowing group work. As the superior aspects of pandemic practices, they expressed the most environmental diversity. Some prospective teachers stated that pre-pandemic and pandemic activities are interesting and offer situations to associate them with daily life. Below are examples of prospective teachers' opinions, who stated the superior aspect of pre-pandemic out-of-school learning environments activities as hands-on learning (PT3) and pandemic out-of-school learning environments activities as environmental diversity (PT7).

PT3: "... before the pandemic, we were learning and touching the activities of our friends hands-on, but during the pandemic, verbal weight dominated. There was a virtual trip during the pandemic as well, but I don't think it was as effective and active as before the pandemic, but it's good that we went to two or three places before the pandemic and experienced this situation."

PT7: "... the diversity was higher as the virtual media trips used during the pandemic were easier to access, so we traveled and taught the lessons you could not see before the pandemic."

Prospective teachers stated that the most weaknesses of pre-pandemic practices were the environmental limitations and the dispersion of students' concentration. The weaknesses of the practices carried out during the pandemic were limited hands-on learning opportunities, problems arising from internet access, individual teaching of the lessons, and dispersion of concentration. Below are examples of prospective teachers' opinions stating the weaknesses of pre-pandemic out-of-school learning environments activities as environmental limitations (PT21) and the weakness of pandemic out-of-school learning environments activities as lack of hands-on learning (PT16) opportunities.

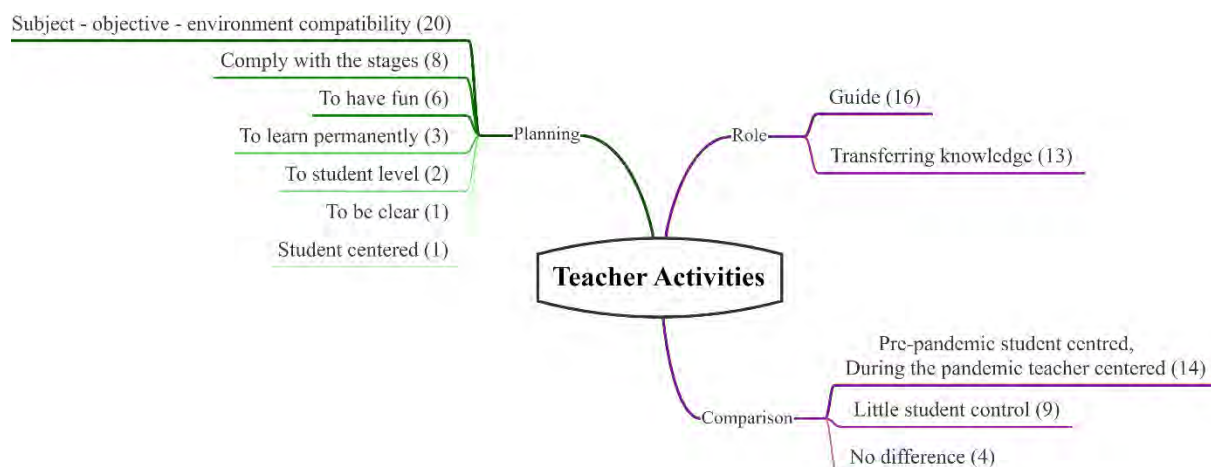
PT21: "... before the pandemic, we had time to teach in one environment with students in one day, but when we teach in a virtual environment, we can visit several cities and several museums in one day. This improves them in terms of general culture."

PT16: "before the pandemic, we had the opportunity to go to a few places outside of school, which were more efficient than activities during the pandemic. We were in everything; we could perform activities using all our five senses. But in the activities which we carried out during the pandemic, we used our dreams in most things."

Under the theme of "teacher activities" regarding out-of-school learning environments, the opinions of prospective teachers were classified under the sub-themes of planning the activities carried out in these environments, the roles of the teachers, and the comparison of the activities performed before and during the pandemic in terms of teacher roles. These classifications are shared in Figure 2.

Figure 2

Prospective Teachers' Views on Teacher Activities in Out-Of-School Learning Environments.



When Figure 2 is examined, prospective teachers stated that under the "planning" sub-theme of the "teacher activities" theme, the situation that they pay the most attention to planning their activities in out-of-school learning environments is subject/objective-environment compatibility. Afterward, they stated to comply with the activity stages and to make the activities fun. Below is the prospective teacher's opinion stating that he pays attention to subject/objective-environment compatibility (PT16) in planning activities carried out in learning environments outside of school.

PT16: "First of all, we gave importance to the compatibility of our objective with the environment we will go to. We looked at what and where we should benefit while gaining this objective. Since I held the activities during the pandemic, we had to use the virtual environment."

The prospective teachers stated that they undertook the roles of guiding and transferring information in activities carried out in out-of-school learning environments in the sub-theme of the relevant theme "role". The opinion examples of prospective teachers who stated that they were in the roles of guide (PT19) and transmitter of knowledge (PT23) as a teacher are given below.

PT19: "I was more like a guide. I guided the students by asking questions. I did not directly say the answers I wanted to reach or the subject I wanted to tell. I set them free and wanted them to arrive by thinking, doing and observing themselves."

PT23: "Giving information about the roles I undertake, the places... I used these roles when planning the lesson, choosing the venue, and lecturing."

In the "comparison" sub-theme of this theme, opinions about the roles of teachers in out-of-school learning activities before and during the pandemic were classified. Prospective teachers stated that pre-pandemic activities were student-centered and teacher-centered activities during the pandemic sequence. Some prospective teachers stated that student control was less in pandemic activities. Four prospective teachers stated that there is no difference in terms of teacher roles in pre-pandemic and pandemic activities. The sample prospective teacher responses that stated the pre-pandemic as student-centered, during the pandemic as teacher-centered (PT13) and the no difference in terms of teacher roles (PT21) are presented below.

PT13: "There is a difference in terms of teacher roles. Before the pandemic, the teacher observes or helps when students are doing activities together while they are more intimate. Since these activities will be more restricted during the pandemic, the teacher assumes a more narrator role."

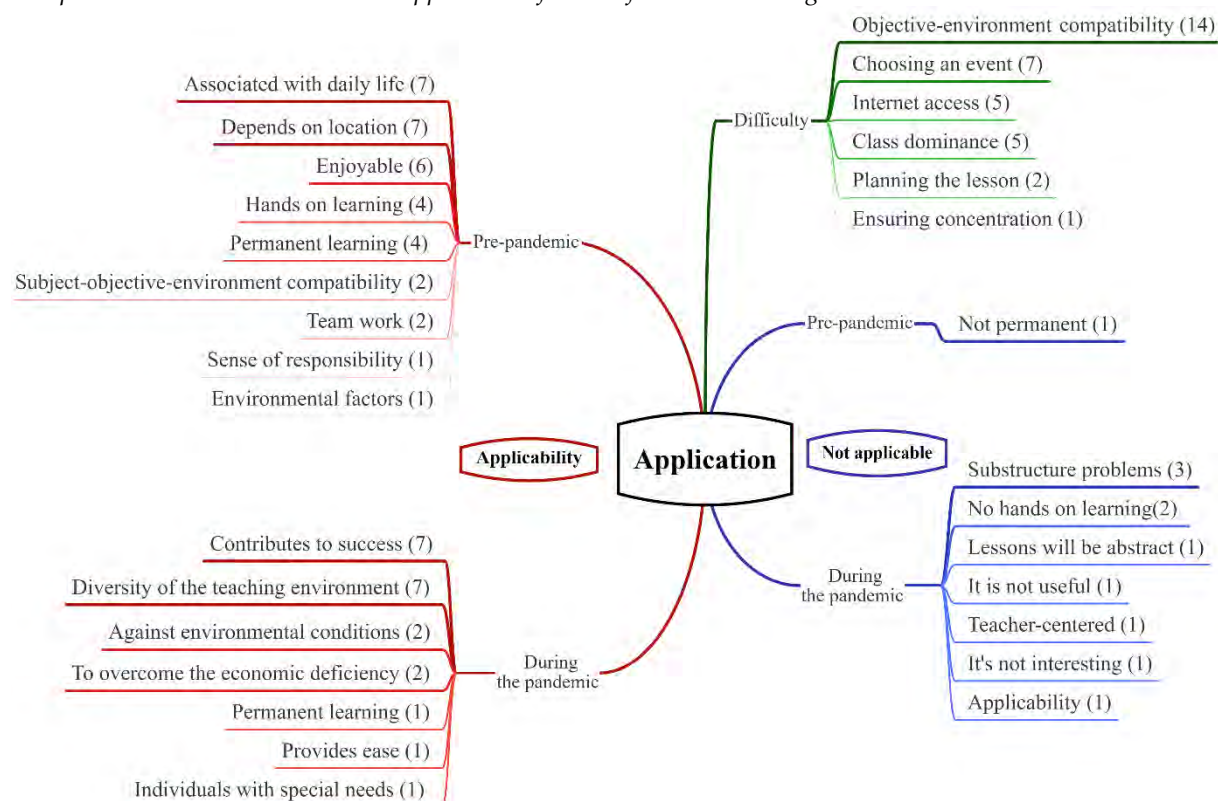
PT21: "In my opinion, there is no difference between teacher roles before and during the pandemic. Even though a teacher has to teach his lesson in a virtual environment, he/she can carry out the lesson within a plan, prepare the appropriate materials and create an atmosphere of trust within the lesson."

In the "application" theme regarding out-of-school learning environments, the opinions of prospective teachers were classified under sub-themes of the difficulties they encountered in the process

of out-of-school learning environments, the applicability of the activities carried out before and during the pandemic. These classifications can be seen in Figure 3.

Figure 3

Prospective Teachers' Views on the Application of Out-Of-School Learning Environments.



When Figure 3 is examined, it is stated that in the sub-theme of "application" theme, "difficulty", the most difficult difficulties that prospective teachers encounter in the process of realizing out-of-school learning environments activities are outcome-space adaptation and activity selection. It was stated by the prospective teachers that there were difficulties in situations such as internet access, classroom domination, lesson planning, and concentration. Examples of the opinions of prospective teachers who have difficulties in terms of outcome-place compatibility (PT21) and classroom domination (PT25) are given below.

PT21: "In the process of preparing the activities within the scope of this course, the most challenging part for me was choosing a topic that would suit the environment and environment. Because you choose a topic/objective or you cannot find a place according to it, or you choose the place, you have difficulty in finding the subject/objective. It is a little difficult to establish this balance."

PT25: "... I had difficulty mastering the class in the course. ... Because it was the first time we were teaching in an outside-of-school environment. But now I can focus very well on the lesson and I find it fun to teach outside of school."

The opinions of prospective teachers on the applicability of pre-pandemic and pandemic out-of-school learning activities were classified in the sub-theme of the relevant theme "applicability". The prospective teachers stated that the pre-pandemic activities can be applied depending on the place and the most related to daily life. On the feasibility of pandemic activities, they expressed the opinion that it contributes the most success and offers a variety of teaching environments. The sample prospective teachers' opinions stating that pre-pandemic activities are related to daily life (PT12), that they offer

opportunities to learn by doing and experience (PT26), and that pandemic activities offer diversity in the teaching environment (PT23) and facilitate implementation (PT5) are given below.

PT12: "I think these activities are more suitable for science education than other lessons. Science means every moment of life, so wherever you are outside, you can practice science in some way."

PT26: "Since the things that students learn hands-on will be more permanent, I think that by making good plans, teaching the lessons in relevant places will increase the quality and permanence of the education."

PT23: "... there may not be a place for every objective. When not available, it can be done on the internet. When there is a transportation problem, it can be done on the internet as during the pandemic... If there are physically disabled students in the classroom, the method during the pandemic can be used."

PT5: "I think it can be applied more easily. For example, there is no need for such a situation. With the computers we have, we can apply these activities as much as we want over the projector or smart board, if available."

One prospective teacher who participated in the study stated that the activities before the pandemic would not be permanent and stated that they were not applicable. On the other hand, prospective teachers who did not find pandemic activities feasible stated that they would not use them mostly because of the infrastructure problems and the lack of learning opportunities by doing and experiencing. The sample prospective teacher opinion stating that he will not implement out-of-school learning activities during the pandemic due to infrastructure problems (PT16) is shared below.

PT16: "I don't think that out-of-school learning activities during the pandemic can be very applicable. Yes, there are a lot of virtual museums, national parks, etc. But not everyone may have access to it."

Discussion and Conclusion

In the study, the opinions of the prospective classroom teachers regarding the out-of-school learning environments that were transferred to virtual environments with the Covid-19 epidemic were examined. Prospective teachers' views on out-of-school learning environments were examined under three themes: teaching process, teacher activities, and application. It was seen that the prospective teachers focused on the issue of providing permanent learning in their views on the superior aspects of the teaching process. Falk and Dierking (1997), in their study with 128 children and adults, found that 96% of the participants could recall the trips made during their first year at school. Although this situation does not reveal a definite result about effective learning (Dillon et al, 2006), it shows that experiences in out-of-school learning environments are remembered even after time has passed. Out-of-school learning environments give students the opportunity to gain a new experience by getting out of their routine in the classroom environment. In this case, the conditions in which students' learning take place change, and the process may result in a better learning (Halpern & Hakel, 2003). Considering that science subjects learned at school are not remembered and there are misconceptions (Stocklmayer et al., 2010), it appears as an area that requires more emphasis on science teaching in out-of-school learning environments. Later, they stated that out-of-school learning environments also help to relate topics and objectives with daily life. The decrease in the interest in science in the world has made it necessary to discuss the content of the curriculum and to seek new ways to solve this problem (Stocklmayer et al., 2010). It is stated that science programs are intense in terms of content, science lessons are stated by students as difficult and not related to daily life (Duggan & Gott, 2002). Prospective classroom teachers stated that as a result of the process they spend in out-of-school learning environments, the teaching process carried out in these environments will contribute to associating science subjects and concepts with daily life. In the case of carrying these thoughts of prospective teachers to future teaching environments, a step towards the solution of the problem of relating to real-life will be taken.

Prospective teachers expressed more difficulties in maintaining control as the weaknesses of out-of-school learning environments. Control difficulty, which is seen as a disadvantage in other studies in the literature (e.g. Ay et al., 2015; Bostan Sarioğlan, & Küçüközer, 2017), is seen as a worrying situation in performing learning activities outside of school. Teachers state that control is easier here, as they see the classroom environment as an environment with certain boundaries and familiarity. In addition, they think that they will not be able to teach effectively due to the problems arising from this control (Dyment, 2005). This anxiety can lead teachers to avoid doing activities outside of school. Concentration disruption has also been cited among the weaknesses of out-of-school learning environments. It is seen that teachers have a lack of self-confidence in keeping students' attention constantly in out-of-school learning activities. It was stated that this problem can be overcome by teachers' experiences of participating in activities with children (van Dijk-Wesselius et al., 2020). Thus, active participation arises not only for students but also for teachers. Weather conditions and transportation difficulties are also obstacles that prospective teachers emphasize. Prospective teachers think that they can overcome such obstacles that can be experienced in face-to-face learning environments outside of school through virtual learning environments. This situation also shows that the practices carried out during the pandemic find a response in prospective teachers.

Prospective teachers compared the practices in out-of-school learning environments before and during the pandemic. Regarding the practices before the pandemic, he emphasized the realization of learning by doing and the provision of permanent learning as expressed in the superior aspects of out-of-school learning environments. Klippel et al. (2020) also stated that the students participating in actual field trips focused on concrete aspects and hands-on learning in their research on the opinions of the participants who experienced actual and virtual trip experiences. Hands-on learning may be associated with face-to-face interaction, as virtual excursions are carried out in activities during the pandemic, and activities are carried out only through distance learning on the screen. For this reason, they may think that hands-on learning is not realized in the learning environment during the pandemic. Prospective teachers think that more permanent learning in two learning environments will occur in the pre-pandemic design. Active participation was carried out in both learning environments. Permanent learning is often associated with active participation. However, students learn more meaningfully depending on the quality and depth of the activity, not because they are socially or physically active (Remmen & Frøyland, 2017). This situation may have occurred in the activities in the worksheets prepared by the prospective teachers before the pandemic. During the pandemic, for example, one-week activities were held in Göbeklitepe, while the other week was held in Konya Science Center. In fact, more than one place in the same course was visited in a virtual environment. In this way, the boundaries of the environment are left, and environmental diversity has been provided. The absence of environmental limitations, which is considered to be one of the most important advantages of virtual tours, was expressed by prospective teachers who experienced the process as the superior aspect of learning environments during the pandemic compared to the pre-pandemic. The condition for not having environmental limitations in the teaching process during the pandemic is to have an Internet connection (Kenna & Potter, 2018; Turan, 2015). Therefore, the dominant aspect may disappear due to the Internet connection. Internet access shortage was also stated as the weakness of prospective teachers compared to before the applications performed during the pandemic. During the pandemic, prospective teachers stated that the weakness of the learning environment was individual compared to the pre-pandemic, as they had an individual participation on the screen. On the other hand, they showed that it allows group work as the superior aspect of pre-pandemic. In the study of Klippel et al. (2020), unlike the students who participated in the virtual trips, the students who participated in the actual field trips stated that actual field trips allow group work. It was mentioned by some of the prospective teachers that both learning environments were interesting and related to daily life.

Prospective classroom teachers both managed the process as teachers and had the opportunity to observe as students in out-of-school learning environments. Prospective classroom teachers stated that they pay attention to the compatibility of subject/acquisition and place as a teacher in planning the teaching process. Wolins et al. (1992) state that the link made with the school curriculum is one of the critical factors in out-of-school learning activities. They also state that teacher planning is one of the key factors in establishing the relationship between the curriculum and experiences. The fact that the prospective teachers pay attention to the subject-objective-environment compatibility and associating the activities with the curriculum will lead the future teachers who will do these activities to create effective learning environments designs. In addition, one of the most important factors that motivate teachers to do out-of-school learning activities is that the environment is connected with the curriculum (Anderson et al., 2006). In this case, it is thought that it will create a source of motivation for prospective teachers in performing out-of-school learning activities.

In out-of-school learning environments, prospective teachers stated that they assume the roles of guide and information transfer. Storksdieck (2001) found that teachers were not actually aware of their role in shaping their students' experiences during the trip. However, as a result of the interviews after the trip, the teachers emphasized the preparation before the trip to overcome this situation. In the present study, as the prospective teachers went through the worksheet preparation process in line with the outcome, they fulfilled and defined their roles during the activities. In their opinions on the comparison point regarding the roles of teachers before and during the pandemic, they stated that the pre-pandemic was more student-centered and during the pandemic it was teacher-centered. In the study of Luo et al. (2017), the participants stated that there might be restrictions in student-teacher interaction in virtual learning experiences, and it will not be student-centered. This situation can be explained by the prospective teachers expressing that learning by doing and active participation is more in the activities held before the pandemic.

Regarding the implementation of out-of-school teaching activities, prospective teachers stated that they had difficulties in the pre-teaching preparation process such as subject-objective-environment compatibility, activity selection, and lesson planning. Given the importance of the preparation process in ensuring the effectiveness of out-of-school learning (Griffin & Symington, 1997; Storksdieck, 2001; Türkmen, 2015), prospective teachers' experience in the pre-service period will contribute to overcoming these difficulties. Prospective teachers stated that they also had difficulties in maintaining classroom control and concentration in the process. These difficulties are consistent with the literature (e.g. Dymont, 2005; van Dijk-Wesselius et al., 2020). These are thought to stem from the first experience of prospective teachers. It is thought that prospective teachers who gain experience within the course can produce alternatives to overcome these difficulties. In the study of Mertoğlu (2014), it was observed that prospective teachers felt more confident in themselves professionally after realizing their out-of-school learning experience and that they wanted to do these activities with their students in their professional life. In addition, they stated that they had problems with the internet during the process carried out during the pandemic in virtual environments.

Prospective classroom teachers stated that they found other than one student applicable regarding the applicability of out-of-school learning activities carried out before the pandemic. Prospective teachers found the practices carried out before the pandemic to be applicable because they are related to daily life, fun, hands-on, and provide permanent learning. Practices carried out before the pandemic generally include the first situations that come to mind when it comes to out-of-school learning activities. Therefore, these opinions of prospective teachers are consistent with the statements of prospective teachers and teachers in the literature (e.g. Goksu, & Somen, 2018). The first task of teachers in Turkey is generally located in rural areas. Considering the possible possibilities here, it can be said that prospective teachers offer a feasibility justification depending on the place.

Prospective teachers stated that out-of-school learning practices carried out through virtual trips during the pandemic are applicable in terms of contributing to the success and creating diversity in the teaching environment. Since there is no environmental limitation in virtual trips, many places can be visited on a national or even global scale (Turan, 2015) It can be said that prospective teachers who have experienced this way through virtual trips emphasize the variety of places. Out-of-school learning environments such as museums and science centers may be paid. However, if you have an internet connection, going to these places is free. Therefore, it is seen as more economical. In overcoming this, attention has been drawn to virtual environments. The prospective teachers who thought that the activities carried out during the pandemic were inapplicable supported their views mostly due to technological inadequacies and lack of hands-on learning.

Recommendations

These obstacles can be overcome by using well-planned virtual learning environments if the desire of teachers to conduct lessons in out-of-school learning environments is not realized due to various reasons (transportation, climate, permission, etc.). During the teaching of the lessons, virtual environments can be used to ensure the compatibility of the learning environment with the learning environment, as it offers space diversity. Based on the processes carried out in the research, out-of-school learning activities carried out during face-to-face education can be transferred to online environments in distance education in possible crises. Out-of-school learning environments can be used to achieve the goal of associating the acquired knowledge with daily life in the science curriculum. Well-prepared worksheets can be used to overcome potential problems such as distraction in out-of-school learning environments. Instructional design can be created at certain stages, and certain activities can be created at each stage. Thus, these problems can be solved through the activities on the worksheet and at certain stages.

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