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Academics’ perspective on out-of-school learning environments

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ABSTRACT This study aims to ascertain academicians' opinions about out-of-school learning, awareness of it, and competency to plan learning activities in such situations for the purpose of teaching in out-of-school learning environments (OSLEs). The research group of this study, which was conducted as a case study, consists of 56 academics in the physics, chemistry, biology, and science education programs of education faculties in Türkiye. The Out-of-School Learning Environments Regulation Scale and a form containing four questions were used to data collection. The results from the scale, the average score was calculated as 4.41 for academics with experience in teaching OSLEs and 3.82 for academics without such experience. The qualitative results indicate that academics mostly prefer to focus on environmental education, astronomy, living things and life, and recycling issues through out-of-school learning activities and use different types of OSLEs such as science center, recycling facility and observatory. To conclude, despite the academics' high level of competency in performing out-of-school learning activities, it is evident that they underutilize these activities in their teaching.

Keywords: *Academics, Opinion, Out-of-school learning, Out-of-school learning activities*

Akademisyenlerin bakış açısıyla okul dışı öğrenme ortamları

ÖZ Bu çalışmada, akademisyenlerin okul dışı öğrenme ile ilgili düşüncelerinin, farkındalık ve okul dışı öğrenme ortamlarında öğrenme faaliyeti düzenleyebilme yeterliklerinin okul dışı öğrenme ortamları (ODOÖ) dersi verme deneyimine sahip olma durumu açısından belirlenmesi amaçlanmaktadır. Durum çalışması ile yürütülen çalışmanın araştırma grubunu Türkiye'deki devlet üniversitelerinde eğitim fakültelerinin fizik, kimya, biyoloji ve fen bilgisi eğitimi programlarında görev yapan 56 akademisyen oluşturmaktadır. Veri toplama aracı olarak, “Okul Dışı Öğrenme Ortamları Düzenleme Ölçeği” ile dört soru içeren bir form kullanılmıştır. Ölçekten elde edilen bulgulara göre, ODOÖ dersi verme deneyimi olan akademisyenler için ortalama puan 4,41 ve deneyimi olmayan akademisyenler için ortalama puan 3,82 olarak hesaplanmıştır. Elde edilen nitel bulgular irdelendiğinde akademisyenler okul dışı öğrenme faaliyetleri kapsamında çoğunlukla çevre eğitimi, astronomi, canlılar ve yaşam ile geri dönüşüm konularını tercih etmişlerdir. Öğrenme ortamı olarak da genellikle bilim merkezi, geri dönüşüm tesisi ve gözlem evi gibi farklı türdeki mekânların kullanılmak istendiği görülmüştür. Sonuç olarak, akademisyenlerin okul dışı öğrenme faaliyeti gerçekleştirebilme düzeyleri yüksek olmasına rağmen yürüttükleri eğitim öğretim faaliyetlerinde bu faaliyetlerden yeterli düzeyde yararlanmadıkları görülmektedir.

Anahtar Sözcükler: *Akademisyen, Görüş, Okul dışı öğrenme, Okul dışı öğrenme faaliyetleri*

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INTRODUCTION

The recent technological developments and changes in social life have led to changes in many student characteristics such as learning styles and study techniques. Changing student needs also call for updating the plans and curricula developed for educational activities. Therefore, teaching only in the classroom environment is not sufficient anymore, given the changing approaches to education (Batman, 2020). Conducting science lessons, which are part and parcel of daily life, by supporting various learning activities and through out-of-school learning (OSL) practices is becoming increasingly critical (Karademir, 2013). OSL, viewed as a complement to formal education, is not simply unplanned or unscheduled teaching, but activities carried out outside the school or classroom in line with the curriculum that support the learning experiences in the classroom (Bozdoğan & Kavcı, 2016). Eshach (2007) describes non-formal and informal learning environments in which OSL activities can be carried out: Non-formal learning environments which include planetariums, museums/science centers, national parks, zoos, botanical gardens, excursions/nature activities, industrial establishments, interactive exhibitions and aquariums, and informal learning environments which are home environment, streets/playgrounds, mobile devices, web applications, and e-learning environments (Batman, 2020). Compared with the classroom environment, these learning environments are freer environments that focus on communication, where students can participate more actively in the learning process, learn by gaining experience, and share what they have learned with others in the environment, especially with their peers (Diamond, 1986; cited in Türkmen & Köseoğlu, 2020).

The research on out-of-school learning environments (OSLEs) shows that learning activities completed in OSLEs successfully increase interest and motivation (Aslan & Demircioğlu, 2019; Karademir, 2013; Metin, 2020; Türkmen, 2018) as well as academic success (Bozdoğan & Kavcı, 2016; Clarke Vivier & Lee, 2018; Richmond et al., 2018; Sturm & Bogner, 2010; Şentürk & Özdemir, 2014; Türkmen, 2018). Considering that nature is the source of all subjects in science courses, it's important to expand the scope of teaching science beyond the classroom. Teaching science in the classroom environment should be supported with experiences gained outside the classroom (Türkmen, 2018). Thus, the appropriate and effective use of OSLEs and activities in science teaching is very important (Türkmen & Köseoğlu, 2020). Studies on OSL activities have shown that these activities make significant contributions to science teaching, and that every student from pre-school to higher education level plays an active role in gaining the targeted cognitive (Dewitt & Storksdieck, 2008; Miglietta et al., 2008; Strauss & Terenzini, 2007), and affective (Dewitt & Storksdieck, 2008; Lindemann Matthies & Knecht, 2011; Okur Berberoğlu & Uygun, 2013; Piscitelli & Anderson, 2001) behaviors. In addition, students are provided with opportunities to apply their theoretical knowledge to practice outside of school (Batman et al., 2022). Metz (2005) states that students have difficulty in establishing a relationship between their personal daily life experiences and science lessons at school. To eliminate this problem, new learning environments that provide a reliable perspective on science and thus make students more eager to learn are needed.

The role of knowledge and competencies of teachers, who have the biggest responsibility in the design and implementation of OSL activities, cannot be denied (Türkmen & Köseoğlu, 2020). The studies has shown science teachers' views that the OSL activities allow the students to apply what they've learned in science courses (Çiçek & Saraç, 2017), make links to the contents of the science curriculum (Garrity et al., 2010), increase students' interest and participation in lessons (Carrier, 2009; Çiçek & Saraç, 2017; Faria & Chagas, 2012), ensure retention by experiential learning (Ocak & Korkmaz, 2018; Tatar & Bağrıyanık, 2012), create a learning environment that allow addressing individual differences (Çiçek & Saraç, 2017), embody abstract information (Braund & Reiss, 2006; Ocak & Korkmaz, 2018; Orion & Hofstein, 1994; Tasdemir et al., 2014), and contribute positively to learner development (Büyükkaynak et al., 2016; Clarke Vivier & Lee, 2018; Gülen & Bozdoğan, 2021; Ocak & Korkmaz, 2018; Tatar & Bağrıyanık, 2012). However, teachers have reported some challenges involved in discipline/class management (Büyükkaynak et al., 2016; Çiçek & Saraç, 2017; Gülen & Bozdoğan, 2021; Pekin & Bozdoğan, 2021), guidance before and during the trip (Thomas, 2010), transportation (Çiçek & Saraç, 2017), nutrition (Çiçek & Saraç, 2017), security (Gülen & Bozdoğan, 2021; Ocak & Korkmaz, 2018;

Pekin & Bozdoğan, 2021; Tatar & Bağrıyanık, 2012), financial status/cost (Büyükkaynak et al., 2016; Dillon et al., 2006; Garrity et al., 2010; Koosimile, 2004; Ocak & Korkmaz, 2018), difficulty in planning and organizing activities (Carrier et al., 2013; Garrity et al., 2010; Tal & Morag, 2009), activities taking too much time (Büyükkaynak et al., 2016; Dillon et al., 2006; Gülen & Bozdoğan, 2021; Tatar & Bağrıyanık, 2012), the intensity of bureaucratic procedures (Dillon et al., 2006; Öner, 2015; Pekin & Bozdoğan, 2021; Tatar & Bağrıyanık, 2012), overcrowded classrooms (Ocak & Korkmaz, 2018; Tasdemir et al., 2014), and the limited awareness of the places where the activity can be implemented (Öner, 2015). In addition, the teachers participating in the studies by Tatar and Bağrıyanık (2012) and Büyükkaynak et al. (2016) emphasized that OSLEs are not adequately supported in the science curriculum. However, according to some studies, the teachers have a positive view of having OSL activities, but most of them do not prefer to use OSLEs during their teaching activities (Carrier, 2009; Tatar & Bağrıyanık, 2012) because teachers are not adequately informed about organizing teaching activities in OSLEs (Çiçek & Saraç, 2017; Füz, 2018; Güler, 2009; Koosimile, 2004; Öner, 2015). In-service trainings are organized to equip in-service teachers with these competencies and knowledge. In teacher training in Türkiye, some required courses are offered under the name of "Out-of-School Learning Environments in Science Education" at the senior year of the science teaching program, and elective courses called "Out-of-School Learning Environments" under the vocational knowledge category in other undergraduate programs. In the related studies, pre-service science teachers have reported study centers, private teaching institutions, museums, social circles and friend networks, home and family environment, streets, science centers, industrial establishments and factories, summer science camps, congresses and conferences, zoos, universities, and power plants as their OSLEs (Durukan et al., 2022). The results of these studies point out that pre-service teachers have both positive and negative ideas about OSLEs and the use of OSLEs in teaching. As such, it is important that the pre-service teachers, as teachers of the future, are trained for this purpose in education faculties by academics who have adequate awareness and knowledge about the subject.

Türkmen and Köseoğlu (2020), who included a different research group in their study, obtained the opinions of 34 academics working in the science education to determine the use of OSLEs and the factors affecting science teaching in OSLEs. They concluded that academics think that the science teaching in OSLEs is safe, low-cost, and easily accessible, and academics care about the physical characteristics of these environments and whether they have specialists in them. They also emphasized that the studies to be conducted on science teaching at higher education in OSLEs will make a very important contribution to closing the gap in the literature. Therefore, the study contributes to the literature by examining the perspective of the academics working in the science, physics, chemistry and biology education departments of the education faculties in Türkiye. It aims to determine the knowledge, thoughts and competencies of academics working in education faculties about OSL and their ability to organize learning activities in OSLEs by associating them with their teaching experiences in OSLEs. To achieve this, the following research questions were investigated:

1. What is the level of academics' competencies to organize teaching activities in OSLEs, depending on whether they have experience in teaching in OSLEs?
2. Do the academics' opinions on using OSLEs in the teaching differ depending on whether they have experience in teaching in OSLEs?

METHOD

This study was carried out as a case study. According to Stake (1988; cited in Aytaçlı, 2012), the case study is not a methodological option, but an option to determine what to study. Instead of generalizing, case studies focus on studying what is best understood from the situation and presenting results based on this (Denzin & Lincoln, 2017). This study was conducted as an illustrative case study. Illustrative case studies are descriptive, which use one or two cases to explain a phenomenon, which helps interpret similar data, especially if there is a reason that indicates that the reader has little knowledge about it

(Datta, 1990; cited in Davey, 1990). In this study, using a case study was deemed appropriate since it aimed to determine the knowledge, opinions and self-efficacy of academics about OSL, and their self-efficacy to organize learning activities in OSLEs, by two different cases defined as having or not having the experience of teaching in OSLEs.

Research Group

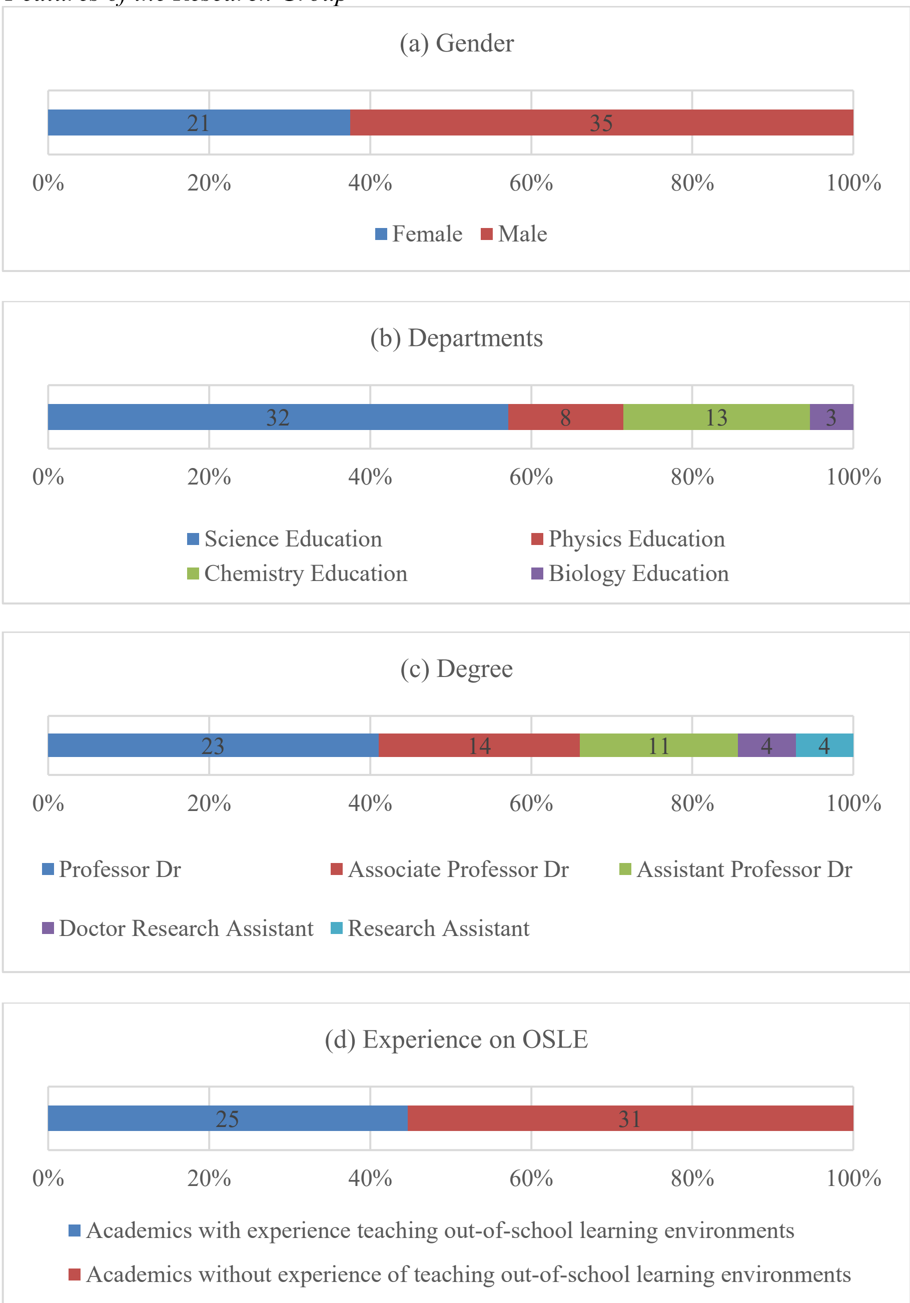
Mostly students, pre-service teachers, and in-service teachers have been included as the research group in studies on OSL activities in Türkiye, as reported by Saraç (2017), and Demircioğlu and Aslan (2018). Thus, to contribute to the sample diversity, the research group in the current study was selected from among academic staff. The research group was formed using criteria sampling, one of the purposeful sampling methods. A researcher who uses this sampling method should determine a criterion for the research group and choose the participants that meet this criterion (Patton, 2002). The criterion for the present study was that the academics who were to make up the research group would be only those that conducted their studies in the science, physics, chemistry and biology teaching undergraduate programs of the education faculties. Thus, a list of academics working in science, physics, chemistry and biology education programs in 50 state universities was created, which included 672 academics. Along with an informative text about the study, the scale and the opinion form were sent to the institutional e-mail addresses of these academics. 56 academics who filled in the data collection tools and returned them constitute the research group of the study. The graphs below depict the demographic features of the research group in Figure 1.

The 62.50% of academics in the research group are female and 37.50% are male. While the majority of academics (57.14%) are lecturers in the science education department, 23.21% are lecturers in chemistry education, 14.29% in physics education, and 5.36% in biology education. The percent of 41.07 of the academics participating in the study are Professor Doctors, 25% Associate Professor Doctors, 19.64% Assistant Professor Doctors, 7.14% Doctor Research Assistants, and 7.14% are Research Assistants. In terms of the demographic information obtained within the scope of the research, 31 academics (55.4%) stated that they had no previous experience of teaching "out-of-school learning environments" course, while 25 academics (44.6%) stated that they had such an experience.

Data Collection Tools and Process

Two data collection tools were used to collect quantitative and qualitative data. First, the Out-of-School Learning Environments Regulation Scale (OOSLRS) was used to determine the knowledge of academics about OSL and their ability to organize OSL activities. Bolat and Köroğlu (2020) developed the scale, which is a 5-point Likert-type scale with 29 items. Statements related to OSL activities in the scale consist of "Strongly disagree", "A little agree", "Moderately agree", "Quietly agree", "Strongly agree". The scale consisted of four sub-factors: The first sub-factor of the scale is "Information" (8 items, about having knowledge about out-of-school learning and its environments), the second sub-factor is "Planning" (8 items, about being able to organize out-of-school learning activities), the third sub-factor is "Application" (6 items, about being able to carry out out-of-school learning activities and provide meaningful learning) and the fourth sub-factor is "Evaluation" (7 items, about being able to assess and evaluate appropriate for out-of-school learning activities). For the factors, the Cronbach Alpha reliability coefficient of substances were calculated 0.86, 0.81, 0.73, and 0.77, respectively. The reliability coefficient value of the scale, which was previously calculated as 0.87, was calculated in this study as 0.89.

Figure 1.
Demographic Features of the Research Group



Another data collection tool is the form, consisting of four open-ended questions. This form was prepared by the researchers to determine the opinions of academics about OSLEs, the use of OSLEs in teaching activities, and the contribution of the teaching activities organized in OSLEs to pre-service teachers. While preparing the form, first of all, a question pool was prepared by making use of the literature in term of the study's purpose. The draft form was presented to the expert opinion of two faculty members, two of whom are science teaching specialists in OSLEs, one of whom conducts research in the physics education and the other in chemistry education. Thus, the content validity of the form was ensured. Both the scale and the form were prepared as an online questionnaire and sent to the academics via e-mail, and they were given one month to respond. The ethical approval for this study was obtained from Social and Human Sciences Scientific Research and Publication Ethics Committee of Trabzon University (the document date and number were 06.06.2022/81614018-000-2200021514).

Data Analysis

The data from OOSLRS were analyzed through descriptive statistics. In addition, in order to interpret the choices of academics about the items in scale sub-factors, the range width 0.80 was determined by dividing the range by the number of options, and the scale score ranges were calculated (Buldur & Bursal, 2015). The average scores obtained were interpreted according to the score range values in Table 1.

Table 1.
Score Ranges of OOSLRS

Statements	Scores	Ranges
Strongly agree	5	4.21-5.00
Quietly agree	4	3.41-4.20
Moderately agree	3	2.61-3.40
A little agree	2	1.81-2.60
Strongly disagree	1	1.00-1.80

Content analysis was used to analyze the data collected via the form. Coding was used to present the data in a meaningful way for the reader, and the data were tabularized. In addition, the abbreviations 'S' for science education, 'P' for physics education, 'C' for chemistry education, and 'B' for biology education were used to describe the fields of academics participating in the research. For example, P5 represents the fifth academic in the physics education.

FINDINGS

The results from the data collection tools are presented under two headings that correspond to research questions.

Perceived Competency Levels of Academics in Organizing Teaching Activities in OSLEs

The results with the OOSLRS about the knowledge of academics about OSL and their competencies in organizing OSL activities are presented in Table 2.

Table 2.
Results on the OOSLRS

Sub-factors	Academics with experience of teaching course of OSLEs average score	Academics without experience of teaching course of OSLEs average score	Difference of the average scores
Information	4.45	3.83	0.62
Planning	4.39	3.66	0.73
Application	4.45	3.90	0.55
Evaluation	4.38	3.91	0.59
Entire Scale	4.41	3.82	0.59

The average scores of the academics from the OOSLRS are given in Table 2. Having a closer look at the average score values obtained from the scale, it is observed that the participants who have experience of teaching course of OSLEs have high average scores for the sub-factors of information ($\bar{x}$=4.45), planning ($\bar{x}$=4.39), application ($\bar{x}$=4.45), and evaluation ($\bar{x}$=4.38) while those who have no experience of teaching course of OSLEs have high average scores for the sub-factors of information ($\bar{x}$=3.83), planning ($\bar{x}$=3.66), application ($\bar{x}$=3.90), and evaluation ($\bar{x}$=3.91). When the distribution of the answers' average scores to the OOSLRS according to the score ranges is examined, it is clear that the average scores of the sub-factors for those with experience in teaching the course of OSLEs are at the level of

"Strongly agree". For the academics who do not have the experience of teaching the course of OSLEs, the average score of the sub-factors are at the level of "Quietly agree" in the OOSLRS. The average score value from entire scale was calculated as 4.41 for academics with experience in teaching the course of OSLEs (at the level of "Strongly agree") and as 3.82 (at the level of "Quietly agree") for academics without experience.

Results Obtained Through the Form

In the form used to determine the opinions of the academics, firstly the question "If you were asked to plan an OSL activity, about which subject would you like to perform this activity? Why?" was asked. The answers are summarized in Table 3.

Table 3.
Subjects that Academics Plan to Use in OSL Activities

Theme	Subjects	Academics with experience of teaching course of OSLEs		Academics without experience of teaching course of OSLEs	
		Academics	f	Academics	f
Environment subjects	Environment	S17, S25, S26, S27, S30, S31	6	S5, S21, S28, B1, B3	5
	Environmental chemistry	C2	1	-	0
Astronomy subjects	Astronomy	S11, S20, P4, P5	4	S19, S23, S24, S32, P2	5
Physics subjects	Sound	S1, S16	2	-	0
	Electric-Electronics	P7, P8	2	-	0
	Optical	P7	1	-	0
	Nuclear physics	P7	1	-	0
	Nanotechnology	-	0	C5	1
	Modern physics	P7	1	-	0
	Mechanical	P7	1	-	0
	Light	S16	1	-	0
	Heat-temperature	-	0	P1	1
	Movement	-	0	S8	1
	Physics	-	0	S10	1
	Simple machines	-	0	C8	1
	Pressure	-	0	S8	1
Chemistry subjects	Recycling	S26, C13	2	S3, S6, S28	3
	Chemical science	C1, C11	2	C3	1
	Physical and chemical changes	-	0	S15, S22, C10	3
	Organic compounds	-	0	C12	1
	Mole concept	-	0	C6	1
	Chemical reactions	-	0	C9	1
Biology subjects	Creatures and life	S2, S16	2	S9, S28	2
	Biology	-	0	S7, S28	2
	Plants	-	0	S8, S29	2
	Biodiversity	-	0	S28	1
	Fossils	S16	1	-	0
	Ecosystem	S16	1	-	0
	Biotechnology	S16	1	-	0
Other subjects	Any science subject	S4	1	S13, S14	2
	STEM	-	0	C5	1
	Nature of science	S12	1	-	0
	Science and technology	S18	1	-	0
No explanation		P3, C4, B2	3	P6, C7	2

As shown in Table 3, a total of 11 academics stated that the OSL activity they would like to plan would be about the subject of Environment. The academics working in the science education reported their views as follows: "My plans within the scope of environmental education because environmental education, first of all, has the content that every citizen should know about, and the protection of the environment is a civic duty. It also includes attitudes and behaviors that can be gained in the social environment along with the school. That's why I would plan in this context outside of school (S5)" and "I could talk about sea and ocean pollution on the beach in order to achieve meaningful and appropriate learning. (S31)". B1, working in the biology education, expressed the reason why he would choose the environment as follows: "… There are many opportunities for teaching outside of school."

Nine academics stated that the OSL activity they would like to develop would be in the context of Astronomy. S20 explained the reason for choosing the subject of astronomy as follows: "Astronomy is one of the most popular subjects for students, and it is one of the most suitable subjects to increase interest in science." S23 offered a different justification as follows: "I think that teaching astronomy in the planetarium will make some abstract concepts very concrete for students." Two academics working in the physics education offered similar reasons: "…Space is very interesting to people (P2)" and "I would like to carry it out on astronomy subjects. The subjects can be made more fun-more understandable for students (P5)".

The most preferred subject, following environment and astronomy, is Recycling, one of the chemistry subjects (Table 3). Regarding this subject, which was touched upon by five other academics, S6 stated that by going to a relevant place outside the school and making on-site observations, students' understanding the subject could be facilitated: "It can be the subject of household waste and recycling. It is a subject that students encounter on a daily schedule. They know what recycling is, but they have trouble understanding how the boxes they throw in the recycling bins take on a different form." Four academics stated that they would prefer to plan activities related to the subjects in the context of the Living Things and Life unit in the biology education. Among these academics, S2 explained how nature can provide a rich learning environment by presenting a different reason: "I would use it in all subjects within the learning domain of living things and life. Because all living and life-related subjects are part of the out-of-school learning environment, I could use the nature itself in this sense and offer enriched learning environments… Besides being a learning environment, the nature also contains tools, materials and models that can be used."

In addition, an example of the statements of the academics under the code of any science subject can be given by the academic coded as S4: "My field is science education. Therefore, I can consider an informal environment related to any science subject as an out-of-school learning environment … It is very difficult to choose just one". When the generally preferred subjects are examined on the basis of the specializations of the academics, the subjects of environment and astronomy in the science education, astronomy in the physics education, recycling in the chemistry education, and living things and life in the biology education clearly stand out. When Table 4 is examined in terms of academics' experience, some differences are observed in the choice of physics, chemistry and biology subjects depending on having teaching experience in course of OSLEs.

With the second question in the form, the academics were asked which OSLE they would like to use within the scope of the subject they chose. Their answers are summarized in Table 4.

In general, it is observed that the most preferred OSLEs by academics are the places such as the botanical garden, natural camping area, park-garden, forest, lakeside, which are included in the National, Thematic Parks and Gardens category (Table 4). Natural and social areas such as forest, park-garden, and picnic area were only recommended by the academics without experience. In addition, while botanical gardens were preferred mostly by academics without experience, national parks were preferred more by academics with experience. Despite this, C1 stated that he preferred the botanical garden in terms of its diversity and because it is a part of daily life. S2 explains why he prefers national parks by saying "I would use national parks ... National parks offer all kinds of environments and materials for living things and their lives ...", S9 offers a similar reason for preferring a waterside as follows: "I would prefer a waterside (such as a seashore or lakeside) because of the variety of samples available." As shown in Table 4, the category of National, Thematic Parks and Gardens is mostly stated by academics working in the fields of science, followed by those working in chemistry and biology, and it is not preferred by academics working in the physics education. It was also found that the second most preferred type of environment by academics is science centers in the category of Science and Research Center. Thus, although the number of academics who stated that they would prefer a place is equal, academics with experience suggest a wider variety of OSLEs types for this theme (Table 4). Furthermore, regarding the reasons for these preferences, S15 stated that he would prefer these places because they are suitable for science education and P1 stated that this was because they would most effectively contribute to the conceptual understanding of students. S18 stated that he would prefer the science center for both his own competence and suitability for his field of study: "… Because this is the closest out-of-school learning environment to my field. I also prepared a book chapter on this subject." P3, which refers to the responsibility of being a member of the faculty of education: "… Appropriate for the attitudes and skills that pre-service teachers can acquire in an out-of-school learning environment." By making a statement like that, he emphasized the aim of educating pre-service teachers. P6, on the other hand, stated that she would prefer science centers to help students for gaining 21st century skills. Table 4 also shows that science and research centers are a type of environment preferred by academics working in all disciplines.

Industrial Organizations such as recycling facilities and factories take the third place as the most preferred OSLE by academics (Table 4). Industrial organizations were recommended by academics in all fields except for the biology education. Explaining the reason for choosing the recycling facility, S6 made the following statement: "… I would like students to see, for example, what kind of process a glass bottle goes through in a recycling factory." Similarly, S3 emphasized that he would prefer factories to enable students to see the production process clearly. C2, on the other hand, stated that he would prefer factories as well as different locations such as Sera Lake and Çal Cave as follows: "… I would also prefer tea factories regarding their chemical processes and waste control …"

As seen in Table 4, museums were preferred only by five academics in the science education. Also, it is seen that experienced academics suggest different types of museums. S30 explained his reason for choosing the nature museum as follows: "… I want students to have knowledge and skills on this subject, I think it will contribute to increasing their awareness." Similarly, the category of Planetarium and Observatory was preferred by five academics. P2 stated that she made this choice because she thought that real observation with big picture and video would be impressive. P4 said: "I would like to use the observatory. I would like students to have activities in these environments to concretize the abstract concepts in their minds and to bring the distant ones closer." While explaining the purpose of the activity he wanted to do, P5 explained that he had such an experience in the planetarium before: "… I made such a plan before. It attracts a lot of attention from students. It increases interest, curiosity and contributes to meaningful learning." However, while universities (f=4), commercial establishments (f=2), power plants (f=2), various institutions-organizations (f=2) are less preferred, natural protected areas and ruins (f=1), digital environments (f=1), and educational institutions (f=1) are the venues that are both least preferred and only specified by experienced academics. Two academics (S13 and C4) emphasized that every venue can be used as an OSLE. In addition, academics who did not have the experience of conducting lessons in OSLEs generally preferred the venues in the National, Thematic Park and Garden category. As can be seen, academics with experience in teaching course of OSLEs were able to offer 25 types of venue suggestions, while academics without experience were able to offer 16 types of venue types (Table 4).

Table 4.
Type of OSLE that Academics Prefer in Planning OSL Activities

Type of OSLE	OSLEs	Academics with experience of teaching course of OSLEs		Academics without experience of teaching course of OSLEs	
		Academics	f	Academics	f
National, thematic park and garden (f=23)	Camping -Natural life park	S19, S17	2	S32, B3	2
	Botanical garden	C1	1	S8, S29, B1	3
	Nature-natural areas (sea, forest, lake, etc.)	S25, S28, S31, C2	4	S7, S9, C6, B3	4
	National parks	S2, S16	2	-	0
	Zoo	S11	1	-	0
	A garden where sustainable agricultural practices can be observed	S27	1	-	0
	Natural and social areas	-	0	S5, S10, C10, C12, B3	5
Science and research center (f=16)	Science Center	S4, S16, S18, S20, P3, P7	6	S8, S15, S19, S23, P1, P6, C8, C9	8
	Science fairs	B2	1	-	0
	Nuclear Research Center	P7	1	-	0
Industrial organization (f=8)	Recycling plant	S27, C13	2	S6, S28	2
	Factories	C2	1	S3, C13	2
	Facility that produces energy from waste	S26	1	-	0
	Industrial plant	-	0	P1	1
Museum (f=5)	Science	S16	1	S14	1
	Nature / Natural history	S16, S30	2	-	0
	Science history	S12	1	-	0
Planetarium – observatory (f=5)	Planetarium	S16, P4, P5	3	S8, P2	2
	Observatory	P4, P5	2	P2	1
University (f=4)	Classes within the Faculty of Fine Arts	S1	1	-	0
	Lab trip	S21	1	-	0
	University	-	0	C3, C5	2
Power plants (f=2)	Sustainable power generation plants	S27	1	-	0
	Dams	-	0	P8	1
Commercial establishments (f=2)	Dairy	-	0	S22	1
	Food industry	C1	1	-	0
Various organizations (f=2)	Municipality	-	0	S21, B1	2
Everywhere	Anywhere/all out-of-school learning environments	C4	1	S13	1
Natural protected areas and ruins (f=1)	Çal (a Turkish town) Cave	C2	1	-	0
Digital environments (f=1)	Distance Learning	C11	1	-	0
Educational institutions/ organizations (f=1)	Schoolyard	S16	1	-	0

Then the academics were asked if they wanted to design an OSL activity later, and which other discipline or disciplines they would like to relate to it, and based on the answers received, the disciplines with which they relate the OSL activity are summarized in Table 5.

Table 5.
Disciplines with Which Academics Relate OSL Activity

Discipline	Academics with experience of teaching course of OSLEs		Academics without experience of teaching course of OSLEs	
	Academics	f	Academics	f
Biology	S25, S30, C2, C11	4	S8, S9, S21, P2, P6, C3, C8, C9, C10, C12	10
Physics	S11, S12, P5, C11,	4	S3, S7, S8, S9, S32, C6, C9, C10, B3	9
Chemistry	S11, P7	2	S3, S7, S8, S9, S21, S30, P2, P6, B1, B3	10
Mathematics	S4, S25, S27, P5	4	S13, S22, S23, S29, P6, C5, C9, B3	8
Engineering	P4, P9, C13	3	S15, S23, S28, S29, P6, C5, C9	7
Fine Arts	S16, S26, S27, S31	4	S13, S29	2
Environment/Nature	S31, C13	2	S3, S5, S21, C8	4
Social Sciences	S2, S17, S20	3	S6, S22	2
Technology	P3, C13	2	S13, S23, S29	3
Astronomy	P4	1	S32, P2, B3	3
Health	S16, C1, C13	3	P1	1
History	-	0	S13, S28, S29, B3	4
All disciplines	C4	1	S10, S14	2
Geography	S17, C2	2	S24	1
Information technologies	S16	1	C9	1
Sociology	S26	1	S28	1
Literature	S27, S31	2	-	0
Nutrition and dietetics	C1	1	-	0
Music	S1	1	-	0
Earth science	S19	1	-	0
Archaeology	-	0	S28	1
Policy	S31	1	-	0
Economy	S31	1	-	0
Science	B2	1	-	0
Applied Sciences	P7	1	-	0
No information	S18	1	C7	1

Academics often stated the disciplines they could relate with OSL activities as biology (f=14), physics (f=13), chemistry (f=12), mathematics (f=10) and engineering (f=10). Academics who made an association with the disciplines of mathematics and engineering generally emphasized STEM education. For example, it was explained by S15 as follows: "I would like to associate it with engineering so that students could make designs within the scope of STEM education and obtain information about this profession". In addition, academics reported that they could organize OSL activities in fine arts (f=6), environment (f=6), social sciences (f=5), technology (f=5), astronomy (f=4), health (f=4), and history (f=4) disciplines. For example, the statement of F4, one of the academics who wanted to use astronomy among the disciplines that can be related is as follows: "I would relate astronomy to environmental engineering. I would try to get students to realize that there is an order surrounding the matter and that there is an order in the sky." While three academics stated that they could establish relations with any discipline, S10 explained the idea as follows: "I would try to associate it with as many fields as possible to provide a holistic perspective. It is not possible to put all of them to work at the same time, but associations can be made over different dimensions at different dimensions. In this way, it can be realized how the disciplines, which seem to be independent from each other, are in a unity in nature". In addition, academics stated that they can integrate different disciplines such as geography, information technologies, sociology, literature, nutrition and dietetics, music, earth sciences, archaeology, politics, economics, natural sciences and applied sciences into such activities. Some academics also reported taking their students' thoughts on the discipline into consideration when choosing a discipline. For example, P5 said: "Physics and mathematics. Both courses are difficult or boring for students". There are also academics who talk about the importance of establishing relationships with different disciplines such as fine arts and literature while choosing a discipline. For example, S27 said: "My discipline is closely related to Science and Mathematics. But I would prefer to associate it with the fields of Art and Literature. because it is an important achievement for students to see that each subject can be related to many fields" In addition, some academics stated that they can take their own interests into consideration when choosing a discipline, which can be exemplified by "(I'd choose) physics because I have more interest and predisposition to physics than biology (C6)" and "My field is biology, which is related to chemistry (B1)".

When the disciplines with which the academics establish relationships for OSL activities are analyzed by their experience, academics with experience are seen to establish relationships with a wider variety of disciplines than those who do not (Table 5). It was determined that these different disciplines include various types of art such as literature and music, as well as disciplines such as economics and politics in the field of social sciences, and the discipline of nutrition and dietetics in the field of health. However, differing from academics with experience, the only discipline preferred by the inexperienced academics was Archaeology. Further, academics without experience in the discipline types specified as common made more statements regarding science, mathematics, engineering, environment and history disciplines compared to those who do not. Those with experience made a higher number of statements on fine arts, social studies, health and literature disciplines than those who do not.

Finally, the academics participating in the study were asked the following question: "What are your opinions on the professional contribution of using OSLEs in the teaching of science and other related disciplines to pre-service teachers?" The participants answered this question in two different ways as "Practitioner" and "Learner". The answers of the academics to this question are displayed in Table 6.

Table 6.
Professional Contributions of OSLEs to Pre-Service Teachers According to Academics

Theme	Codes	Academics with experience of teaching course of OSLEs		Academics without experience of teaching course of OSLEs	
		Academics	f	Academics	f
Pre-service teacher as learner	Planning and implementation of environments and activities to be carried out in these environments	S1, S4, S20, S30	4	S5, S8, S15, S29, C8, B1	6
	Increasing awareness and questioning skills by seeing the diversity of environments and their relationship with science	P5, C1, C2, C4, C13	5	S7, S9, S28, C5	4
	Contributing to the development of 21st century skills	S16, S31, C11	3	S6, S13, S24, P6	4
	Gaining the ability to use different methods together	S2, P4	2	S10, P1, P2	3
	Gaining social skills	S31, B2	2	-	0
	Gaining experience	S18, S26, S27	3	S32, B3	2
Pre-service teacher as practitioner	Providing permanent and meaningful learning	C2	1	C6, C9, C10	3
	Demonstrate the relationship of subjects with daily life	S25	1	S22, C3	2
	Increasing interest, curiosity and motivation towards the course	-	0	S10, C9	2
	Difficult to execute due to bureaucratic obstacles	P7	1	-	0
	Contribution of place-based learning	-	0	S19, S21	2
	Seeing interdisciplinary collaboration	S17	1	-	0
Insufficient response	Thinks it will make a contribution, but no detailed explanation given	S5, S12, P3, P8	4	S14, S23	2
	No explanation	-	0	C7	1

The participants stated that OSL activities contribute in different ways, depending on being the practitioner or the learner. Under the theme of pre-service teacher as the learner, these contributions generally allow pre-service teachers to gain experience in planning and implementing activities in these environments (f=10), to see the relationship between environments and science (f=9), and to contribute to the development of 21st century skills (f=7).

Some exemplary statements for these three codes, respectively, are as follows: "I think that if they have the ability to plan, create content, organize pre- and post-event activities for OSLEs, they will have positive effects. But if they do not have these skills and knowledge, they will not be useful because they cannot use it effectively. (S1)". "Definitely, teaching programs (at faculties of education) now want to use out-of-school activities effectively for teaching not only in school but also outside. If pre-service teachers have experience in this field, they can teach more effectively. (S20)". "I definitely think so. The most important person or people who need to learn about this subject are teachers and pre-service teachers to be teachers of the future. If we can convey the meaning and importance of this subject to teachers, we may reach a wider target audience. (S9)". "Yes. At the very least, the importance of on-site learning can be better understood, and it will be experienced in a concrete way that learning can take place in any environment other than the classroom or laboratory. (S28)". "It will definitely contribute to it positively. Now, single-discipline teaching in education allows only limited thinking. I believe that disciplines should be integrated so that students can acquire and use the thinking skills expressed as the 21st century skills. "The out-of-school learning environment helps teaching in classroom with only one dimension to gain different dimensions. (S6)". "Yes. I think that these (field) trips will increase the social skills, communication skills, self-confidence and entrepreneurial abilities of pre-service teachers. (S31)". It can be observed by looking at the codes in Table 6 that only the academics who have experience of teaching course of OSLEs stated that learning activities carried out in OSLEs will contribute to pre-service teachers such as gaining communication skills and self-confidence. Apart from these, if the pre-service teachers take the role of practitioner, students will be provided with permanent and meaningful learning (f=4), they will explore the relationship between science subjects and examples of daily life (f=3) and thus their interest, curiosity and motivation towards the lesson will increase (f=2). Some examples for these three statements are as follows: "Yes, I think so, because in education, it is necessary to explain to the pre-service teachers that there is not or cannot be a learning only in the classroom environment. It contributes to the retention of the applied education or learning work in the environment. (C6)", "Yes, I think that science education can be more closely associated with daily life and that it can teach the achievements of science education more easily from a vocational point of view. (C9)". P7, however, emphasized that pre-service teachers would find it challenging to carry out OSL activities in their professional lives due to bureaucratic obstacles (transportation, permission, etc.). On the other hand, six academics stated that OSLEs would contribute to pre-service teachers professionally but did not provide a detailed explanation (Table 6).

DISCUSSION AND CONCLUSION

In this study, which sought to determine the awareness, opinions, and self-efficacy of the academics in science, physics, chemistry, and biology education departments, some important details were discovered. The results with the OOSLRS indicated that while the academics who teach the OSLEs course have high average scores for sub-factors of information and application; the academics who do not teach the course of OSLEs have high average scores for sub-factors of application and evaluation. It is thought that this result is directly related to the teaching experience. When Table 2 examined in terms of the average scores obtained in the sub-factors, it was seen that the highest difference between the two groups is in the planning sub-factor, and the lowest difference is in the application sub-factor. This may imply that academics who do not teach the course may have difficulties in planning teaching activities because the out-of-school learning environment is different from the classroom environment, but they feel more competent in carrying out the planned teaching activities. Thus, it can be said that the academics do not benefit from these OSL activities sufficiently in their teaching activities. Similarly, Türkmen and Köseoğlu (2020) found that academics do not sufficiently tap into OSLEs in the activities they carry out during their own lessons. In addition, various studies in the literature have reported that teachers face many difficulties in organizing OSL activities, such as cost, time, lack of support from school management and parents, presence of crowded classes, negative attitudes of students, and too many responsibilities, and that teachers have insufficient knowledge and experience about the design and implementation of such activities (Anderson et al., 2006; Büyükkaynak et al., 2016; Cox Petersen et al., 2003; Çiçek & Saraç, 2017; Gülen & Bozdoğan, 2021; Pekin & Bozdoğan, 2021; Tatar & Bağrıyanık, 2012; Türkmen, 2018). However, Ateşkan and Lane (2016) explained that teachers need confidence to plan and conduct OSL activities. Similar reasons can be thought to underlie the failure of academics to benefit from these activities.

Analyzing the units or subjects that academics will prefer in planning OSL activities, it was revealed that environment, astronomy, recycling and living things are the most preferred subjects (Table 3). Parallel to the academics' choice of subject in the current study, previous studies have found that OSL activities are held in planetariums for astronomy subjects (e.g. Plummer, 2009; Türk & Kalkan, 2015), in recycling facilities for environment and recycling subjects (e.g. Dori & Tal, 2000) and in botanical and zoo gardens for the subject of living things (e.g. Randler et al., 2012; Sellmann & Bogner, 2013; Wünschmann et al., 2017). In addition, when the relevant results are examined in terms of academics with or without out-of-school teaching experience, it is noteworthy that only the academics who do not teach the relevant course mentioned the subjects that might be appropriate to be associated with OSLEs (e.g. physical and chemical changes; Aslan & Arslan, 2021). Although they do not have the experience of teaching the relevant course, the ability of academics to establish subject-venue relations can be explained by their ability to plan OSL activities. When the explanations of the academics regarding the reasons for choosing the subjects, they will choose in case of planning an OSL activity are examined, their statements about achieving appropriate and meaningful learning, increasing interest in the lesson, making it more fun and understandable, and embodying abstract concepts attract attention. These results are consistent with the results (Table 2) obtained from the scale indicating that academics know the educational value of OSL activities and their impact on meaningful learning. Therefore, it can be said that all of the academics with and without teaching experience are aware of the positive effects of OSL activities on students.

When Table 4 is analyzed, it is clear that academics with experience are able to offer a wider variety of venue types than academics who do not. In this regard, as expected, the experience of teaching in course of OSLEs can be said to increase the awareness of academics about the types of venues that can be used for out-of-school teaching. The fact that natural and social areas such as forests, parks-gardens and picnic areas are only recommended by inexperienced academics supports this argument. Since these OSLEs are frequently used for "school trips", no previous experience is necessary to become aware of them. When Table 4 is examined considering the disciplines of the academics, it is clear that the National, Thematic Park and Garden category is mostly stated by the academics working in the science, then chemistry and biology, but it is not preferred by the academics working in the physics. However, using thematic parks (amusement park, game parks, etc.) as OSLE in teaching subjects such as the application areas of physics, its sub-disciplines and its relationship with other disciplines is a convenient, accessible and attractive option. Therefore, it is remarkable that thematic parks and gardens were not recommended as an OSLE by academics working in the physics education. Presenting the content analysis of studies on OSLEs in Türkiye, Saraç (2017) found that OSLEs are generally carried out in playgrounds. Büyükkaynak et al. (2016) found that science teachers care more about physical criteria when choosing OSLEs, they prefer school gardens and laboratories as OSLEs. Gülen and Bozdoğan (2021) also determined that teachers use the school garden most frequently as the OSLE, and Pekin and Bozdoğan (2021) revealed that science teachers mostly use schoolyards for learning activities organized in the "Physical Events" learning area. In their study of solving physics problems in the amusement park, Nielsen et al. (2009) found that these learning activities support the deep learning and metacognitive learning process by creating a rich environment for experiential learning that stimulates both their bodies and minds.

It is an important result that science and research centers are the type of venue preferred by academics working in all disciplines. The similarity of scientific research procedures at universities and science-research centers may be the underlying reason for this. For students, to convey a realistic understanding are visits to OSLEs such as science labs at research institutes or universities, and the main focus of the activities applied on these OSLEs includes hands-on experiments different than the usual experiments in school and closer to current scientific research by scientists (Stamer et al., 2021). For example, these OSLEs are highly common, and widely known with both teachers and students in Germany (Garner & Eilks, 2015). Similarly, Mierdel and Bogner's study (2021) clearly demonstrated the potential of teaching in these out-of-school labs in addition to traditional experimental tasks in fostering cognitive achievement. Additionally, science and research centers, which are at the forefront of environments where basic sciences and examples of these sciences in daily life are presented to individuals of all ages in an impressive way, are one of the preferred learning environments in most of the studies carried out in the context of OSLEs (Kuralay, 2022; Tahancalio, 2019). As such, it is an expected result that the OSLE recommended by academics regardless of discipline is science and research centers, and it is considered critical to increase the number of science centers throughout the country, which have a great importance in teaching science subjects.

It was also found that industrial organizations are recommended by academics other than those working in the biology education. Considering the content of the subject, the teaching of processes such as ethyl alcohol and lactic acid fermentation in biology lessons can be exemplified through the production carried out in industrial organizations such as tea or dairy products. Iron casting factories can be visited to introduce chemistry related professions (e.g. metallurgical engineering) in the teaching of chemistry subjects and concepts, and visits to environments such as dialysis centers or food packaging facilities can be organized to teach about mixture separation techniques used in industry and healthcare. Regarding the discipline of physics, power plants can be visited to evaluate the advantages and disadvantages of energy sources, and factories that produce building materials can be visited to make designs for the insulation of living spaces for energy saving. Considering all these examples, the fact that industrial organizations are not recommended as an OSLE for the biology discipline could be due to the extensive focus given to the health and environment issues in the biology course content. The most frequently mentioned OSLE among industrial organizations is recycling facilities. The perception of recycling facilities as a common OSLE for teaching many concepts within various disciplines may have contributed to this.

Museums were preferred only by five academics working in the science education (Table 4). The perception of museums as places that are not used much in teaching science subjects may have led to this result. In addition, the fact that the majority of the academics do not have experience in OSL may have had an effect on this result as well because academics with experience generally stated more types of museums. On the other hand, museums can be used in teaching science subjects for many different purposes. Being located in almost every city and facilitating access through government-run applications (e.g. Müzekart / Museumcard) make museums attractive learning environments. Wildlife museum to classify living things according to their similarities and differences, thematic museums for the variables that affect shade and full shade (e.g. Karagöz Museum/Bursa), and the forestry museum to determine what factors affect biodiversity, and the science and technology history museum to teach astronomical measurements can be given as examples of associating science disciplines with museums. It is also thought that the academics' awareness of nature (historical) and science museums should also increase.

Two of the academics participating in the study emphasized that every place can be used as an OSLE. OSLEs enable students to discover their own regions' production, culture, art, and geographic potential, to recognize plant and animal species, local characteristics, games and folklore in line with the subjects and outcomes as part of curricula and are defined as the places where learning activities are carried out to enable them to learn by doing through curriculum-integrated or extracurricular activities (MoNE, 2019). Therefore, the term "everywhere" can be used for OSLEs. Considering the relationship between their fields of specialization and the suggested OSLEs, it is striking that the academics in science and physics education suggest the planetarium, academics in science and chemistry education suggest recycling facilities, factories and university, academics in science education suggest museums, and the academics in chemistry education suggest natural sites and digital environments. Although a direct relationship could not be established between some disciplines and suggested environments (for example, chemistry-digital environments), in most of them (for example, natural sites-chemistry, planetarium-physics), a subject/outcome-venue relationship could be established. Places such as industrial organizations, universities, natural sites, digital environments and school gardens are preferred by academics less frequently. When Table 4 is considered in terms of experience of teaching in course of OSLEs, academics without teaching experience can be seen to prefer OSLEs such as forest, park-garden, and picnic areas, which highlight socialization and entertainment and are mostly used for school trips. Factors such as not knowing enough about the educational value of the activities carried out in OSLEs and not planning the teaching processes by establishing an outcome-venue relationship may have a role in the emergence of this result.

As shown in Table 5, the disciplines preferred by academics in establishing interdisciplinary relations are biology, physics and chemistry, which are similar to their fields of expertise. Different disciplines such as archeology, music, sociology and literature are rarely mentioned. In Özyıldırım and Durmaz (2022) study, pre-service teachers stated that with an interdisciplinary approach, field trips contributed to the unification/integration of different subjects or disciplines, to gaining different or new perspectives, to forming common concepts on the same subjects in different fields, and to raising awareness about different OSLEs. As such, it will be useful in many ways for academics to take an interdisciplinary approach as a basis in OSL activities they will carry out with pre-service teachers or present as an example to them. Furthermore, individuals can be helped in terms of facilitating their learning, providing the opportunity to establish links with daily life, drawing their attention to the subject, reinforcing learning of the subject and ensuring their learning retention (Karakuş et al., 2017).

The vast majority of academics reported that OSLEs contribute to the teaching of science and other related disciplines in various ways, and these contributions mainly occur due to the fact that pre-service teachers gain experience in planning and implementing activities in OSLEs, see the relationship of the science discipline with OSLEs, and improve their 21st century skills (Table 6). However, as shown in Table 6, the academics who do not have the experience of conducting lessons in OSLEs ignore the contribution of the activities in OSLEs to pre-service teachers' social communication skills. Similarly, Kreuzer and Dreesmann (2017) found that improvement in pre-service teachers' social skills derived from discussions, interaction, and communication through the out-of-school learning activities. Apart from these, contributions such as ensuring the permanent and meaningful learning of their future students and allowing them to see the relations of science subjects with daily life were also stated. Thus, the awareness of the academics about the contributions of OSL activities to both pre-service teachers and their future students was high (Table 6). However, considering that places such as science centers, thematic parks and gardens are often recommended as OSLEs and rarely museums and school gardens, it can be concluded that academics should have more information about the types of venues that can be used.

Limiting learning to school in the 21st century may also restrict individuals' interests, curiosity and different thinking skills (Yıldırım, 2022). While various events happen outside of school that have an impact on society, keeping students in the classroom and maintaining the status quo may not support students adequately enough to help them gain real-life experiences. The responsibility for closing the gap between what is learned at school and what is experienced outside falls to teachers, researchers, experts who take part in the preparation of curricula and create education policies. In light of the results, it is suggested that academics should be supported to use OSLEs more effectively and necessary arrangements should be made to make science teaching practices/activities widespread at universities in OSLEs. OSLEs, frequently used in the teaching of science and its sub-disciplines (physics, chemistry, biology), should be discussed in detail, exemplified, and practical activities should be carried out as part of the "Out-of-School Learning Environments" course in undergraduate programs. As a result of this, pre-service teachers will be able to see themselves as more competent in actively using OSLEs in their teaching. Increasing the number of learning environments such as museums, planetariums, botanical gardens, factories and science centers across the country to allow visiting OSLEs more frequently during the training of pre-service teachers will also support teaching science.

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TÜRKÇE GENİŞLETİLMİŞ ÖZET

Geleceğin öğretmenleri olacak öğretmen adaylarının eğitim fakültelerindeki öğrenim süreçlerinde okul dışı öğrenme ortamlarına yönelik eğitimlerinin, konuya yönelik farkındalığa ve bilgiye sahip olan akademisyenler tarafından verilmesi önemlidir. Bu bağlamda yürütülen çalışmanın amacı, eğitim fakültelerinde görev yapan akademisyenlerin okul dışı öğrenme ile ilgili sahip oldukları bilgilerinin, düşüncelerinin ve bu ortamlarda öğrenme faaliyeti düzenleyebilme yeterliklerinin okul dışı öğrenme ortamları dersi verme deneyimleri ile ilişkilendirilerek belirlenmesidir. Bu amaç çerçevesinde çalışma kapsamında "Akademisyenlerin Okul Dışı Öğrenme Ortamları (ODÖO) dersi verme deneyimi olup olmamasına göre okul dışı öğrenme ortamlarında öğretim faaliyetleri düzenleyebilme yeterlikleri ne düzeydedir?" ve "Akademisyenlerin okul dışı öğrenme ortamlarının öğretim sürecinde kullanımına yönelik düşünceleri, okul dışı öğrenme ortamları dersi verme deneyimine sahip olup olmamasına göre değişiklik göstermekte midir?" problemleri cevaplanmaya çalışılmıştır.

Bu çalışma, durum çalışması türlerinden Açıklayıcı/Tanımlayıcı Durum Çalışmaları kapsamında yürütülmüştür. Bu bağlamda çalışma grubu oluşturulurken, amaçlı örnekleme yöntemlerinden ölçüt örnekleme yönteminden yararlanılmıştır. Bu çalışma için ölçüt, çalışma grubunu oluşturan akademisyenlerin çalışmalarını eğitim fakültelerinin fen bilgisi, kimya, fizik ve biyoloji öğretmenliği lisans programlarında yürütmeleridir. Bu kapsamda, 50 devlet üniversitesinde fen bilgisi, fizik, kimya ve biyoloji eğitimi programlarında görev yapan 672 akademisyene ulaşılmıştır. Veri toplama araçlarını doldurup geri dönen 56 akademisyen araştırmanın çalışma grubunu oluşturmaktadır. Çalışmanın amacı kapsamında hem nicel hem de nitel veriler toplamak için; Bolat ve Köroğlu (2020) tarafından geliştirilen "Okul Dışı Öğrenme Ortamları Düzenleme Ölçeği (ODÖDÖ)" ile araştırmacılar tarafından geliştirilen ve açık uçlu dört sorudan oluşan görüş formu kullanılmıştır. Ölçekle elde edilen veriler betimsel istatistikler ile analiz edilmiştir. Ayrıca ilgili akademisyenlerin seçimlerini genel olarak yorumlayabilmek için dizi genişliği seçenek sayısına bölünerek aralık genişliği "4/5=0,80" belirlenmiş ve ölçek puan aralıkları hesaplanmıştır. Elde edilen ortalama puanlar Tablo 1'de yer alan puan aralık değerlerine göre yorumlanmıştır. Görüş formuyla elde edilen veriler ise içerik analizi ile çözümlenmiştir.

Ölçekten elde edilen ortalama puan değerleri irdelendiğinde, ODÖO dersi verme deneyimi olan akademisyenlerin bilgi, planlama, uygulama ve değerlendirme alt faktörlerine ait ortalamaları, dersi verme deneyimi olmayan akademisyenlere göre daha yüksektir. ODÖDÖ'ye verilen cevapların ortalama puanlarının puan aralıklarına göre dağılımı incelendiğinde, ODÖO dersi verme deneyimi olanların alt faktörlerinin ortalama puanları "Tamamen Katılıyorum" düzeyinde, dersi verme deneyimi olmayan akademisyenlerin ise "Çok Katılıyorum" düzeyindedir. Alt faktörlerden elde edilen ortalama puanlar açısından Tablo 2 incelendiğinde, iki grup arasındaki en yüksek farkın planlama alt faktöründe, en düşük farkın ise uygulama alt faktöründe olduğu görülmektedir. Bu durum, dersi vermeyen akademisyenlerin okul dışı öğrenme ortamının sınıf ortamından farklı olması nedeniyle öğretim etkinliklerini planlamada güçlük yaşayabileceklerini ancak planlanan öğretim etkinliklerini gerçekleştirmede kendilerini daha yetkin hissettiklerini düşündürebilir. Dolayısıyla, akademisyenlerin öğretim faaliyetlerinde okul dışı öğrenme etkinliklerinden yeterince yararlanmadıkları söylenebilir.

Görüş formundan elde edilen bulgular irdelendiğinde, akademisyenlerin okul dışı öğrenme ortamlarındaki faaliyetler kapsamında çoğunlukla çevre eğitimi, astronomi, canlılar ve yaşam ile geri dönüşüm konularını ele almayı tercih ettiklerini belirlenmiştir. İlgili bulgular (Tablo 3) akademisyenlerin deneyim durumları açısından incelendiğinde; okul dışı öğrenme ortamları dersi verme deneyimine sahip olmaları ile fizik, kimya ve biyoloji konularının seçiminde farklılaşmalar görülmektedir. Öğrenme ortamı olarak ise akademisyenlerin genellikle bilim merkezi, geri dönüşüm tesisi, açık alan (doğa) ve gözlem evi gibi farklı türdeki mekânların kullanılmak istendiği görülmüştür. Genel olarak bakıldığında, akademisyenler tarafından en çok kullanılmak istenen okul dışı öğrenme ortamlarının "Milli, Tematik Park ve Bahçe" kategorisinde yer alan botanik bahçesi, doğal kamp alanı, park-bahçe, orman, göl kenarı gibi mekânlar olduğu görülmektedir (Tablo 4). "Milli, Tematik Park ve

Bahçe” kategorisinin en çok fen, daha sonra da kimya ve biyoloji alanında çalışan akademisyenler tarafından belirtildiği, fizik alanında çalışan akademisyenler tarafından ise hiç tercih edilmediği; bilim ve araştırma merkezlerinin ise tüm branşlarda çalışan akademisyenler tarafından tercih edilen bir mekân türü olduğu görülmektedir (Tablo 4). Bu kapsamda, okul dışı öğrenme ortamları dersi vermeye yönelik deneyimi olan akademisyenler 25 çeşit mekân türü önerisi, deneyimi olmayan akademisyenler ise 16 çeşit mekân türü önerisi sunabilmişlerdir. Öte yandan, katılımcılar kendi disiplinlerinin öğretimi sırasında matematik, sosyal bilgiler, biyoloji, müzik ve mühendislik bilimleri gibi disiplinler ile ilişki kurmak isteyeceklerini ifade etmişlerdir. Akademisyenlerin okul dışı öğrenme faaliyeti için ilişki kurdukları disiplinler deneyim sahibi olma durumlarına göre irdelendiğinde ise; deneyim sahibi olan akademisyenlerin olmayanlara göre daha çeşitli disiplin türü ile ilişki kurabildikleri görülmektedir (Tablo 5).

Akademisyenlerin okul dışı öğrenme faaliyeti planlamada tercih edecekleri ünite/konular ders verme tecrübesi olan ve olmayan akademisyen olma durumu açısından incelendiğinde, aslında okul dışı öğrenme ortamlarıyla ilişkilendirilmesi uygun olabilecek konuların yalnızca ilgili dersi vermeyen akademisyenler tarafından belirtilmesi dikkat çekicidir. İlgili dersi verme deneyimleri olmamasına rağmen, akademisyenlerin konu-mekân ilişkileri kurabilmeleri, okul dışı öğrenme faaliyetleri planlama yeterliliğine sahip olmaları ile açıklanabilir. Akademisyenlerin okul dışı öğrenme faaliyeti planlama durumunda seçecekleri konuları tercih etme sebepleri, ölçekten elde edilen ve akademisyenlerin okul dışı öğrenme faaliyetlerinin eğitsel değerini ve anlamlı öğrenme üzerindeki etkisini bildiklerine dair bulgularla uyumluluk göstermektedir. Bu bağlamda, ders verme deneyimi olan ve olmayan akademisyenlerin tümünün okul dışı öğrenme faaliyetlerinin öğrenci üzerinde sağlayacağı olumlu etkilerin farkında oldukları söylenebilir. Diğer yandan, Tablo 4’te, deneyim sahibi olan akademisyenlerin olmayan akademisyenlere göre daha çeşitli mekân türü önerisi sunabildiği görülmektedir. Bu bağlamda, beklendiği gibi okul dışı öğrenme ortamları dersi verme deneyiminin akademisyenlerin okul dışı öğretim sürecinde kullanılabilecek mekân türlerine yönelik farkındalıklarını arttırdığı düşünülebilir.

Akademisyenlerin büyük çoğunluğu okul dışı öğrenme ortamlarının fen ve ilişkili olduğu diğer disiplinlerin öğretiminde farklı yönlerden katkıları olduğunu ifade ederken; okul dışı öğrenme ortamları dersi yürütme deneyimi olmayan akademisyenlerin, bu ortamlarda gerçekleştirilen faaliyetlerin öğretmen adaylarının sosyal iletişim becerilerine olan katkısını göz ardı ettikleri görülmüştür. Bunların haricinde, öğretmen adaylarının gelecekteki öğrencilerinin kalıcı ve anlamlı öğrenmelerinin sağlanması, fen konularının günlük hayat ile olan ilişkilerini görmelerine imkân vermesi gibi katkılar da belirtilmiştir. Bu noktada, çalışma grubundaki akademisyenlerin okul dışı öğrenme faaliyetlerinin hem öğretmen adaylarına hem de gelecekteki öğrencilerine sağlayacağı katkılara yönelik farkındalıklarının yüksek olduğu görülmüştür. Ancak okul dışı öğrenme ortamları olarak sıklıkla bilim merkezi, tematik park-bahçe gibi mekânların nadiren de müze, okul bahçesi gibi mekânların önerilmesi dikkate alındığında, akademisyenlerin yararlanılabilecek mekân türlerine yönelik daha fazla bilgi sahibi olmaları gerektiği sonucu ortaya çıkmaktadır.