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Investigation of Science Teachers' Level of Anxiety about Out-of-School Learning*

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Abstract

The purpose of the current study is to determine science teachers' level of anxiety about out-of-school learning environments and to investigate whether this level of anxiety varies significantly depending on different variables. The study employed the survey model, one of the quantitative research methods. The study was conducted in the spring term of the 2021-2022 school year. A total of 153 (110 female and 43 male) science teachers participated in the study. The participation was on a volunteer basis and the data were collected via Google Form. As the data collection tool, the "Science Teachers' Level of Anxiety about Out-of-School Environments Evaluation Scale" was used. In the analysis of the collected data, a statistical program was used and the data were interpreted by looking at the results of independent samples t-test and one-way analysis of variance (ANOVA). In this way, the participating teachers' level of anxiety about out-of-school learning environments and the correlations between this level of anxiety and different variables were revealed. The mean score for the science teachers' general level of anxiety about out-of-school learning environments was found to be 77.22. The participants stated that out-of-school learning environments make them partially concerned. No significant correlation was found between the science teachers' level of anxiety about out-of-school learning environments and the gender variable. On the other hand, significant correlations were found between the science teachers' level of anxiety about out-of-school learning environment and the variables of having received training on out-of-school learning environments, administrative attitude, frequency of visiting out-of-school environments, using out-of-school environments in science education and being able to prepare a plan for out-of-school teaching.

Keywords: Anxiety, out-of-school learning environments, teacher

1. Introduction

Science and technology are developing very rapidly in the 21st century, leading to changes in the needs of individuals and societies and the skills expected from individuals. In the 2023 Education Vision, it is aimed to educate individuals who are equipped with the skills of the age and who are interested in science. The skills expected from the individual in the science curriculum are defined as producing knowledge and transferring it to daily life, problem solving, critical thinking, being decisive and entrepreneurial, having communication skills and empathy and contributing to society and culture. In this context, the role of teachers is not to

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directly transmit knowledge to students, but to guide them in becoming critical thinkers and innovative individuals (MEB, 2018).

Some problems may be encountered during the teaching carried out for the goals desired to be achieved in science education. These problems are categorized into four groups by Balbağ, Leblebiciler, Karaer, Sarıkahya and Erkan (2016): teacher-related, student-related, environmental and physical conditions-related and curriculum-related. Communication deficiencies, lack of professional self-efficacy and adopting a traditional approach as the teaching and assessment technique can be teacher-related problems, while lack of preparedness and motivation, the perception that science lessons are difficult due to the requirement of certain mathematical skills and negative student behaviours in laboratory and other learning environments can be student-related problems. Although science subjects are intertwined with our daily lives, science lesson is seen as a difficult lesson thus less liked by students. It is very difficult to achieve goals such as arousing interest for the science lesson in students, accomplishing the objectives set in science curriculum and making their knowledge meaningful and permanent only through activities conducted in the classroom environment (Çiçek & Saraç, 2017). In fact, the formal education carried out in the school remains far away from the real dynamics and natural flow of life (Ramey-Gassert, 1997). Supporting science lessons, which are highly related to daily life, with out-of-school learning environments is important for students to develop in a versatile way and to acquire the skills of the age.

Out-of-school learning refers to the conduct of formal learning activities in informal environments. Out-of-school learning refers to the learning experiences that take place outside the school building, utilizing various locations and institutions, in a planned and adaptable manner throughout the academic year, and that are supportive of formal education. Museums and archaeological sites, national parks, zoos, botanical gardens, aquariums, science centres, industrial establishments, industrial facilities and school gardens are typical examples of learning environments suitable for out-of-school learning (Laçin Şimşek, 2020). Out-of-school learning, which contributes to the formal education carried out at school as a supplement and enrichment, is not independent from the school because its content is grounded on the curriculum. Out-of-school education, like in-class education, is conducted within a specific methodological framework (Şen 2019). In this regard, within the scope of the "2023 Education Vision" of the Ministry of National Education, a guidebook for out-of-school learning environments has been prepared to enable teachers and students in public and private pre-school, elementary and secondary education institutions affiliated to the Ministry of National Education to become more familiar with learning environments such as museums, science centres, art centres, historical and cultural sites, libraries, natural conservation areas and archaeological sites, techno-parks, open industrial establishments and universities. The aim is to contribute to students' learning by experiencing and applying the objectives set in the curriculum (MEB, 2019).

Since out-of-school learning also includes elements that can foster personal interest, it can increase intrinsic motivation in students (Eshach, 2007). However, until now, activities and visits conducted outside the school have not been perceived as learning opportunities; they have been regarded as activities where students would have fun, spend time with friends and explore new places. In our country's education system, activities such as end-of-year trips, picnics, museum visits and zoo visits have been primarily considered as opportunities for students to spend time with their friends, have fun and explore new places. In recent approaches, it is believed that these diverse and rich venues should be integrated with lessons and their potential should be utilized. It is expected that the conducted trips and visits are organized according to predetermined learning objectives and the achievement of these objectives is evaluated (Laçin Şimşek, 2020). Out-of-school learning activities are a process that needs to be skilfully

prepared, considering the pre-activity, during-activity and post-activity stages. Out-of-school learning environments play a crucial role in facilitating experiential learning, allowing for the firsthand experience of educational materials that are difficult to bring into the classroom (Şen, 2022).

It is noted that out-of-school learning activities, which have many positive contributions to science lessons, can be used to relate the lessons to daily life, make the lessons enjoyable and ensure permanent learning (Batman, 2020; Bozdoğan & Kavcı, 2016). In these learning environments outside the school setting, where individuals personally learn by being curious, researching, seeing, observing, and experimenting, the retention of knowledge increases (Sontay, Tutar & Karamustafaoğlu, 2016). Studies have shown that students find acquiring knowledge in out-of-school environments more enjoyable and engaging. It has also been found that the knowledge gained in these environments is more enduring, and the utilization of such environments helps students acquire higher-order learning skills (Avan, Gülgün, Yılmaz & Doğanay, 2019; Erten & Taşçi, 2016; Genç, Albayrak & Söğüt, 2019; Kılıç & Şen, 2014). Furthermore, the findings obtained from the literature indicate that out-of-school learning environments play a significant role in students' academic achievements (Randler, Kummer & Wilhelm, 2012), interests-curiosities (Behrendt & Franklin, 2014), attitudes (Yıldırım, 2018), motivations (Ramey-Gassert & Walberg, 1994), research skills (Katz et al., 2011), communication-social skills (Sözer & Oral, 2016), scientific process skills (Bodur, 2015), learning outcomes (Bozdoğan, Okur & Kasap, 2015) and fostering positive attitudes towards science (Kelly, 2000). Out-of-school learning environments are crucial in increasing students' excitement towards learning science and facilitating the understanding of abstract science topics by relating them to everyday life (Carrier, 2009; Çiçek & Saraç, 2017; Laçin Şimşek, 2020).

Teachers play a crucial role in the successful implementation of out-of-school learning activities. Kete and Horasan (2013) have reported that teachers play a key role in utilizing out-of-school learning environments to support the instructional process. It is crucial for teachers to demonstrate willingness, responsibility and sensitivity during the process of organizing out-of-school learning environments in order to create a successful learning environment (Bozdoğan, 2016). Therefore, revealing the thoughts of teachers, who are the implementers and essential components of the education system, regarding out-of-school learning environments will provide a foundation for activities that can support the use of these environments. According to the study conducted by Siegel (2007), teachers support out-of-school education and recommend its continuity. However, it is known from the literature that teachers tend to avoid using out-of-school learning environments (Kubat, 2017; Moseley, Reinke & Bookout, 2002; Pekin and Bozdoğan, 2021). In a study conducted by Sarışan Tungaç (2015) on science teachers, it was revealed that although teachers find out-of-school learning environments beneficial, they generally face obstacles and difficulties that prevent them from implementing these environments.

The number of studies investigating teachers' perspectives on out-of-school learning environments has significantly increased in recent years. In the literature, studies have been conducted on various aspects related to out-of-school learning environments, including teachers' and pre-service teachers' perspectives (Sarıoğlan & Küçüközer, 2017; Tatar & Bağrıyanık, 2012), self-efficacy beliefs (Fırat Durdukoca, 2023; Sarışan Tungaç, 2015), attitudes (Çığrık & Özkan, 2016; Özyıldırım & Durmaz, 2022), experiences (Çiçek & Saraç, 2017; Mertoğlu, 2019), students' views on this subject (Bakioğlu & Karamustafaoğlu, 2020; Sontay & Tutar, 2016), students' motivation related to this topic (Demirel & Özcan, 2020) and in-service training programs on out-of-school learning environments (Dönel Akgül & Arabacı, 2020). In addition, scales related to teachers' anxiety levels regarding the use of out-of-school learning environments have been developed (Arık & Bozdoğan, 2022; Üner, 2019). However,

studies specifically investigating the concerns of science teachers regarding out-of-school learning environments are limited (Arık & Bozdoğan, 2022). No studies have been found that specifically examine the concerns of science teachers regarding various variables related to the subject. In this context, this study aims to contribute to the literature by examining the general concerns of science teachers regarding out-of-school learning environments, their level of anxiety related to these environments and the variables that influence their level of anxiety. The purpose of the study is to determine science teachers' level of anxiety about out-of-school learning environments and to examine whether this level of anxiety varies significantly in relation to different variables:

- ✓ What are the descriptive statistics calculated for the variables related to the science teachers examined within the context of the study?
- ✓ What is the science teachers' level of anxiety about out-of-school learning environments?
- ✓ Does the science teachers' level of anxiety about out-of-school learning environments vary significantly depending on the variables of gender, having in-service training about out-of-school learning environments, administrative attitude, frequency of visiting out-of-school learning environments, using out-of-school environments in science education and preparing a plan for out-of-school learning?

2. Method

2.1. Research Model

The current study employed the survey model, one of the quantitative research methods. According to Karasar (2005), survey studies are studies conducted to describe a situation that exists at a certain time as it is.

2.2. Study Group

The study group consists of 153 (110 female, 43 male) science teachers working in middle schools affiliated to the Ministry of National Education in Denizli. While selecting the participants, the convenience sampling method, which is a non-random sampling method, was used.

2.3. Data Collection Tool

In the current study, a personal information form was used to elicit some demographic features of the science teachers and the "Science Teachers' Level of Anxiety about Out-of-School Learning Environments Scale" developed by Üner (2019) was used to determine the science teachers' concerns about out-of-school learning environments. In the personal information form, there are questions to elicit information about the participants' gender, having training about out-of-school learning environments, administrative attitude towards out-of-school teaching, frequency of visiting out-of-school learning environments, using out-of-school learning environments for science education and preparing a lesson plain for out-of-school learning. The scale developed by Üner (2019) consists of 25 items. The scale is a five-point Likert scale with the response options of "They do not make me anxious at all", "They do not make me anxious", "They make me partially anxious", "They make me anxious" and "They make me very anxious". The Cronbach Alpha reliability coefficient of the scale was found to be 0.94. The scale is a one factor scale and the highest score to be taken from the scale is 125. The score intervals for the level of anxiety in the scale are as follows as determined by Üner (2019):

Table 1. Score Intervals for the Level of Concern in the Scale

Item Score	Scale Total Score	Level of Concern
1.00 – 1.80	25-45	They do not make me anxious at all
1.81 – 2.60	45.01-65	They do not make me anxious
2.61 – 3.40	65.01-85	They make me partially anxious
3.41 – 4.20	85.01-105	They make me anxious
4.21 – 5.00	105.01-125	They make me very anxious

2.4. Data Collection Process

Science teachers working in schools located in the city of Denizli and its districts in the spring term of the 2021-2022 school year were tried to be reached. First school principals were contacted and then the telephone numbers of the science teachers were taken and the questionnaire was sent to the science teachers via Google Form. The data were collected by the researchers between May 1st and May 15th via Google form in a digital environment.

2.5. Data Analysis

A statistical program package was used in the analysis of the data. On the basis of the collected data, it was determined whether the science teachers' mean anxiety score varies significantly depending on gender, having training on out-of-school learning environments, administrative attitude, using out-of-school environments in science education and preparing a plan for out-of-school learning by conducting an independent samples t-test and one-way variance of analysis (ANOVA) was conducted to determine whether their mean anxiety score varies significantly depending on the frequency of visiting out-of-school environments.

Before looking at the t-test and ANOVA results from statistical analyses, it was tested whether the variances of the groups were equal. Levene's Test value was used to decide whether the variances of the distributions of the measurements in both groups were equal. Group variances are homogeneous when the p (significance) value of Levene's test is greater than .05 (Durmuş, Yurtkoru & Çinko, 2018).

First, Kolmogorov-Smirnov normality test was performed in order to test the assumption that the measurements of the dependent variable show a normal distribution in both groups. When the results of the Kolmogorov-Smirnov test are examined, it is seen that the data are normally distributed for the variable of "gender" (for males p= .200 and p> .05, for females p= .200 and p> .05) and that the variances are homogenous (p=.787 and p> .05), that the data are normally distributed for the variable of "having training on out-of-school learning environments" (for yes p= .200 and p> .05, for no p= .200 and p> .05) and that the variances are homogenous (p=.901 and p>.05), that the data are normally distributed for the variable of "administrative attitude" (for positive p= .200 and p> .05, for negative p= .200 and p> .05) and that the variances are homogenous (p=.658 and p> .05), that the data are normally distributed for the variable of "frequency of visiting out-of-school learning environments" (for never p= .200 and p> .05, for rarely p= .200 and p> .05, for frequently p= .200 and p> .05) and that the variances are homogenous (p= .470 and p> .05), that the data are normally distributed for the variable of "using the out-of-school learning environments for science teaching" (for yes p= .200 and p> .05, for no p= .200 and p> .05) and that the variances are homogenous (p=.783 and p> .05), the data are normally distributed for the variable of "planning a lesson plan for out-of-school learning environments" (for yes p= .200 and p> .05, for no p= .200 and p> .05) and that the variances are homogenous (p= .465 and p> .05).

For this reason, the t-test was used to investigate the effects of gender, having training on out-of-school learning environments, administrative attitude, using out-of-school environments in science education and preparing a plan for out-of-school teaching on the science teachers' level of anxiety about out-of-school learning environments. ANOVA was used to test the effect of frequency of using out-of-school environments in science teaching.

2.6. Reliability

In the reliability analysis of the "Science Teachers' Level of Anxiety about Out-of-School Learning Environments Scale", Cronbach Alpha internal consistency coefficient was checked. In the current study, Cronbach Alpha internal consistency was found to be .924.

2.7. Ethics Committee Approval

Ethics committee approval of the study was obtained with the decision of Pamukkale University Social and Human Sciences Scientific Research and Publication Ethics Committee dated 15/06/2022 and numbered E-93803232-622.02-221115.

3.Findings

The findings obtained in the study are given below in line with the sub-problems of the study.

3.1. Descriptive Statistics Obtained for the Science Teachers in relation to the Variables Examined in the Current Study

The descriptive information about the science teachers participating in the study in relation to the variables examined in the study is given in Table 1:

Table 1. Descriptive Statistics Obtained for the Science Teachers in relation to the Variables Examined in the Current Study

Variables	Categories	F	%
Gender	Female	110	71.9
	Male	43	28.1
Having Training on Out-of-School Learning Environments	Yes	63	41.2
	No	90	58.8
Administrative Attitude towards Out-of-School Teaching	Positive	124	81
	Negative	29	19
Frequency of Visiting Out-of-School Learning Environments	Never	30	19.6
	Rarely	99	64.7
	Frequently	24	15.7
Using Out-of-School Learning Environments in Science Education	Yes	113	73.9
	No	40	26.1
Preparing a Lesson Plan for Out-of-School Learning	Yes	71	46.4
	No	82	53.6

When the data are examined, it is seen that more than half of the teachers (58.8%) did not receive training on out-of-school learning environments. The percentage of teachers who frequently visit out-of-school learning environments is quite low (15.7%). It is observed that the majority of the teachers do not encounter negative administrative attitudes towards out-of-school learning (81%). Furthermore, it is seen that most of the participating teachers use out-of-school learning environments for science education (73.9%). More than half of the teachers stated that they are unable to prepare lesson plans for out-of-school learning (53.6%). In

addition, the majority of the science teachers participating in the study are female teachers (71.9%).

3.2. Science Teachers' Level of Anxiety about Out-of-School Learning Environments

It was determined that the mean anxiety score of the science teachers regarding out-of-school learning environments is 77.22 and their item mean score is 3.09. Accordingly, the participants stated that out-of-school learning environments partially worried them.

3.3. Investigation of Whether the Science Teachers' Level of Anxiety Varies Depending on Different Variables

Below are given the results of the analyses conducted to determine whether the science teachers' level of anxiety about out-of-school learning environments varies significantly depending on the variables of gender, having training on out-of-school learning environments, administrative attitude, frequency of visiting out-of-school environments, using out-of-school environments in science education and preparing a lesson plan for out-of-school learning.

3.3.1. Investigation of Whether the Science Teachers' Level of Anxiety Varies Significantly Depending on Gender

The findings obtained from the analysis of whether the science teachers' level of anxiety about out-of-school learning environments varies significantly depending on gender are given in Table 2.

Table 2. Results of the t-Test Conducted to Determine Whether the Science Teachers' Level of Anxiety about Out-of-School Learning Environments Varies Significantly Depending on Gender

Gender	N	$\bar{X}$	Ss	T	Sd	P
Female	110	78.33	14.08	1.58	151	.115
Male	43	74.37	13.25			

As seen in Table 2, the science teachers' level of anxiety about out-of-school learning environments does not vary significantly depending on gender ($t=1.58$, $p>.05$).

3.3.2. Investigation of Whether the Science Teachers' Level of Anxiety Varies Significantly Depending on Having Training on Out-of-School Learning Environment

The findings obtained from the analysis of whether the science teachers' level of anxiety on out-of-school learning environments varies significantly depending on having training on out-of-school learning environments are given in Table 3:

Table 3. Results of the t-Test Conducted to Determine Whether the Science Teachers' Level of Anxiety on Out-of-School Learning Environments Varies Significantly Depending on Having Training on Out-of-School Learning Environments

Having Training on Out-of-School Learning Environments	N	X̄	Ss	T	Sd	P
Yes	63	74.35	14.18	-2.155	151	.033
No	90	79.22	13.47			

As seen in Table 3, the science teachers' level of anxiety on out-of-school learning environments varies significantly depending on having training on out-of-school learning environments ($t = -2.155$, $p < .05$). The mean anxiety score of the teachers having training on out-of-school learning environments ($\bar{X} = 79.22$) is higher than that of the teachers not having taken training on out-of-school learning environments ($\bar{X} = 74.35$).

3.3.3. Investigation of Whether the Science Teachers' Level of Anxiety Varies Significantly Depending on Administrative Attitude

The findings obtained from the analysis of whether the science teachers' level of anxiety on out-of-school learning environments varies significantly depending on administrative attitude are given in Table 4:

Table 4. Results of the t-Test Conducted to Determine Whether the Science Teachers' Level of Anxiety on Out-of-School Learning Environments Varies Significantly Depending on Administrative Attitude

Administrative Attitude towards Out-of-School Learning Environments	N	X̄	Ss	T	Sd	P
Positive	124	75.53	13.48	-3.183	151	.002
Negative	29	84.41	13.74			

As seen in Table 4, the science teachers' level of anxiety on out-of-school learning environments varies significantly depending on administrative attitude towards out-of-school learning environments ($t = -3.183$ $p < .05$). The mean anxiety score of the teachers having administrators with a positive attitude towards out-of-school learning environments ($\bar{X} = 84.41$) is higher than that of the teachers having administrators with a positive attitude ($\bar{X} = 75.53$).

3.3.4. Investigation of Whether the Science Teachers' Level of Anxiety Varies Significantly Depending on Frequency of Visiting Out-of-School Learning Environments

The findings obtained from the analysis of whether the science teachers' level of anxiety on out-of-school learning environments varies significantly depending on frequency of visiting out-of-school learning environments are given in Table 5:

Table 5. Results of the ANOVA Conducted to Determine Whether the Science Teachers' Level of Anxiety on Out-of-School Learning Environments Varies Significantly Depending on Frequency of Visiting Out-of-School Learning Environments

Source of the Variance	Sum of Squares	Degree of Freedom	Mean Square	F	P	Significance
Between-Groups	3048.346	2	1524.173	8.648	.000	Never-frequently
Within-Groups	26437.536	150	176.250			Never-rarely
Total	29485.882	152				

As seen in Table 5, the science teachers' level of anxiety on out-of-school learning environments varies significantly depending on frequency of visiting out-of-school learning environments ($F(2.150) = 8.65$, $p<.05$). Scheffe test was conducted to find the source of the difference. The mean anxiety scores of the teachers frequently visiting out-of-school learning environments ($\bar{X}= 71.96$) and the teachers rarely visiting ($\bar{X}= 75.89$) are lower than that of the teachers never visiting ($\bar{X}= 85.80$). The calculated eta-square value is 3048.346/ 29485.882= 0.10. Accordingly, approximately 10% of the variance observed in the teachers' level of anxiety depends on the "frequency of visiting out-of-school learning environments".

3.3.5. Investigation of Whether the Science Teachers' Level of Anxiety Varies Significantly Depending on Using Out-of-School Learning Environments for Science Education

The findings obtained from the analysis of whether the science teachers' level of anxiety on out-of-school learning environments varies significantly depending on using out-of-school learning environments are given in Table 6:

Table 6. Results of the t-Test Conducted to Determine Whether the Science Teachers' Level of Anxiety on Out-of-School Learning Environments Varies Significantly Depending on Using Out-of-School Learning Environments

Using Out-of-School Environments for Science Education	N	$\bar{X}$	ss	T	Sd	P
Yes	113	75.78	13.89	-2.171	151	.031
No	40	81.28	13.39			

As seen in Table 6, the science teachers' level of anxiety on out-of-school learning environments varies significantly depending on using out-of-school learning environments for science education ($t =-2.171$ $p<.05$). The mean anxiety score of the teachers not using out-of-school learning environments for science education ($\bar{X}= 81.28$) is higher than that of the teachers using out-of-school learning environments for science education ($\bar{X} = 75.78$).

3.3.6. Investigation of Whether the Science Teachers' Level of Anxiety Varies Significantly Depending on Preparing a Lesson Plan for Out-of-School Learning

The findings obtained from the analysis of whether the science teachers' level of anxiety on out-of-school learning environments varies significantly depending on preparing a lesson plan for out-of-school learning are given in Table 7:

Table 7. Results of the t-Test Conducted to Determine Whether the Science Teachers' Level of Anxiety on Out-of-School Learning Environments Varies Significantly Depending on Preparing a Lesson Plan for Out-of-School Learning

Preparing a Lesson Plan for Out-of-School Learning	N	X̄	Ss	T	Sd	P
Yes	71	73.37	13.23	-3.282	151	.001
No	82	80.55	13.73			

As seen in Table 7, the science teachers' level of anxiety on out-of-school learning environments varies significantly depending on preparing a lesson plan for out-of-school learning (t=-3,282 p<.05). The mean anxiety score of the teachers who cannot prepare a lesson plan for out-of-school learning (X̄= 80.55) is higher than that of the teachers who can prepare a lesson plan (X̄ = 73.37).

4. Discussion, Results and Suggestions

In the study, the science teachers were found to be partially concerned about out-of-school learning environments. This result is parallel to the studies by Üner (2019) and Şahin (2022). Ince and Akcanca (2021) examined parental views on the use of out-of-school learning environments in early childhood education. In their study, parents stated that the risks and hazards combined with discipline and control difficulties are disadvantages of utilizing out-of-school environments. Kisiel (2005) examined the motivations of primary school teachers towards out-of-school learning environments. The study reported that teachers' concerns regarding students taking on responsibilities and maintaining discipline in these environments were significant factors that led to the avoidance of such practices. Tatar and Bağrıyanık (2012) also stated that teachers are concerned about the use of out-of-school learning environments for the safety of students. Bozdoğan (2012) evaluated out-of-school learning practices with pre-service teachers and showed that one-third of the pre-service teachers may be worried for safety reasons. Another study revealing that teachers are concerned about safety is the one conducted by Sarışan Tungaç (2015) in which science teachers' opinions about out-of-school learning environments were obtained. It is difficult for the teacher to control the teaching carried out in out-of-school learning environments, and for this reason, it may cause the concern that the teaching will not be effective for students' acquiring the intended content (Sarıoğlan & Küçüközer, 2017). Teachers have been found to be concerned about certain negative factors related to students, such as lack of interest, presence of hard-to-control students, lack of motivation and students' viewing the environment as purely the source of entertainment. Additionally, factors such as large number of students and insufficient attention from other stakeholders also caused anxiety among teachers (Dönel Akgül & Arabacı, 2020; Ocak & Korkmaz, 2018; Özgan & Aydın, 2010).

In the current study, it was found that the science teachers' mean anxiety score does not vary significantly depending on the variable of gender. Şahin (2022) conducted a study on pre-service primary teachers and revealed that gender had an effect on the level of anxiety. It was concluded that the female pre-service teachers' level of anxiety is significantly higher than that of the male pre-service teachers.

Another result of the current study is that receiving training on out-of-school learning environments reduces the level of anxiety towards these environments. In the literature, it was determined that teachers expressed their concerns about having insufficient knowledge and lack of self-efficacy about trips to out-of-school environments, and that they thought that they were

not sufficient in guiding students on these trips (Bozdoğan, 2012; Griffin & Symington, 1997; Kisiel, 2005; Orion & Hofstein, 1994; Thomas, 2010). Şahin (2022) also examined the effect of the variable of taking training on out-of-school learning and concluded that the pre-service teachers who did not take training were more concerned than the pre-service teachers who took the training. The result obtained by Şahin (2022) supports the result of the current study. Individuals tend to avoid unfamiliar practices, and when they do engage in such practices, they may develop negative emotions due to their perceived inadequacy. Well-planned training is needed to support the use of necessary applications in education. Moseley et al. (2002) stated that the self-efficacy of pre-service teachers who participated in the three-day environmental education program was high before and after the program, but decreased after a certain period of time. Updating the training on out-of-school learning environments over time will support the preference of such environments in teaching.

In the current study, it was concluded that the science teachers' level of anxiety about out-of-school learning environments is correlated with their ability to prepare lesson plans for these environments. It was observed that the level of anxiety of the teachers who stated that they could prepare a lesson plan is lower for these environments. Kablan (2012) emphasized the significant impact of the mediating variable role of lesson planning skills on the implementation of lesson plans. The study concluded that there is a strong correlation between the process of lesson planning about cognitive skills and the implementation of the prepared lesson plan. Being able to plan for a subject to be taught enhances teachers' implementation skills by strengthening their abilities to effectively manage time and have command over the subject matter, the learning environment and the students. This, in turn, reduces feelings of anxiety. These results show the importance of training programs that can be organized about out-of-school learning environments.

As a result of the current study, it was seen that the attitude of the school administration towards organizing trips to out-of-school environments affects the science teachers' level of anxiety. It was concluded that the mean anxiety score of the teachers whose administrators have a negative attitude towards organizing trips to out-of-school learning environments is higher than that of the teachers whose administrators have a positive attitude towards out-of-school environments. In their study, Tatar and Bağrıyanık (2012) stated that teachers faced difficulties arising from the administrative attitude towards the use of out-of-school learning environments. School administrators think that the use of out-of-school learning environments poses financial constraints, creating conflicts between the administrator, teacher and parents (Aydemir & Toker Gökçe, 2016). The negative attitude of administrators towards the use of out-of-school learning environments increases teachers' concerns and reduces their motivation to utilize these learning environments.

In the current study, it was observed that one of the other variables affecting the teachers' level of anxiety is the frequency of visiting out-of-school learning environments. It was concluded that the teachers who never visit these environments have higher level of anxiety about out-of-school learning environments than the teachers who visit these environments frequently and rarely. Gürsoy (2018) emphasizes the importance of teachers visiting out-of-school learning environments, stating that these environments should be assessed and necessary precautions should be taken in order to prevent potential negative outcomes before the visit.

The current study finally concludes that the teachers who utilize out-of-school learning environments in science education exhibit lower level of anxiety about these environments compared to the teachers who do not utilize out-of-school learning environments in science education. Büyükkaynak, Ok and Aslan (2016) emphasized that out-of-school learning environments have positive effects on students; however, they highlighted that science teachers

do not use these environments extensively during the school year. The study conducted by Sarıoğlan and Küçüközer (2017) supports the findings of the current study by stating that pre-service teachers are able to overcome their existing concerns through the experiences they have in out-of-school learning environments. Experiences allow for the formation of clarity in the mind, providing individuals with the opportunity to take precautions against certain difficulties and disadvantages. This, in turn, reduces teachers' concerns about out-of-school environments and encourages them to use these environments more frequently.

In light of the findings of the current study, the following suggestions can be made:

- ✓ Science teachers can be provided with examples of project, seminar and workshop activities that are related to out-of-school learning, as well as examples of activities that can be conducted in out-of-school learning environments.
- ✓ By analyzing the responses given by science teachers to specific items on the scale, qualitative research can be conducted to investigate the underlying reasons for their concerns expressed in these items.
- ✓ Parent-teacher-school administration cooperation can be established in order to address the items in the scale which the science teachers found concerning.
- ✓ Science teachers' concerns can be examined by using different anxiety scales.

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Ethics Committee Approval

Ethics committee approval of the study was obtained with the decision of Pamukkale University Social and Human Sciences Scientific Research and Publication Ethics Committee dated 15/06/2022 and numbered E-93803232-622.02-221115.