

## THE INVESTIGATION OF PRE-SCHOOL TEACHERS' ECOLOGICAL LITERACY KNOWLEDGE AND AWARENESS LEVEL

### OKUL ÖNCESİ ÖĞRETMENLERİNİN EKOLOJİK OKURYAZARLIK BİLGİ VE FARKINDALIK DÜZEYLERİNİN İNCELENMESİ

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**Abstract:** Most of the environmental problems that have been faced by the earth today are the consequences of insufficient ecological literacy levels of individuals. Ecological literacy can be defined as the ability to understand the language of nature and acting in accordance with the workings of nature. The preschool teachers play an important role in imparting this ability to the children. Therefore, the purpose of this research is to investigate preschool teachers' knowledge and awareness levels on ecological literacy. A total number of 155 Turkish preschool teachers working in different provinces participated to the present study. In data collection, an interview form developed by the researchers, containing demographic information questions and questions related to the Australian Fire, were used. Descriptive analysis was used to analyse the data. The respondents (n=119, 81%) expressed that they are not a member of any non-governmental organization related to environment / nature / ecological literacy issues while (n=28,19%) are mostly members of TEMA Foundation. Whilst some (n=86,55.5%) of the respondents stated that they have heard of the concept of ecological literacy before, some other (n=69,44.5%) respondents stated that they do not recognize the concept. Participants' definitions of ecological literacy were found in line with literature, and their responses to questions showed they have ecological literacy knowledge, but what extent their knowledge is reflected to their behaviour, needs further investigation. In this vein, ecological literacy trainings can be organized for preschool teachers.

**Keywords:** Preschool period, environmental education, sustainability, ecological literacy.

**Özet:** Günümüzde yaşanan çevre sorunlarının temelinde bakıldığında bireylerin ekolojik okuryazarlık düzeylerinin yetersiz olması yatmaktadır. Ekolojik okuryazarlık; doğanın dilini anlamak ve doğanın işleyişine uygun davranmak şeklinde tanımlanabilir. Bu becerinin çocuklara kazandırılmasında okul öncesi öğretmenlerinin yeri oldukça önemlidir. Bu araştırmanın amacı; okul öncesi öğretmenlerinin ekolojik okuryazarlığa ilişkin bilgi ve farkındalık düzeylerinin incelenmesidir. Temel nitel araştırma yönteminin kullanıldığı çalışmaya Türkiye'nin farklı illerinde görev yapan 155 okul öncesi öğretmeni katılmıştır. Verilerin toplanmasında araştırmacılar tarafından geliştirilen, demografik bilgileri ve Avustralya Yangını konu edinen örnek olayla ilgili soruları içeren görüşme formu kullanılmıştır. Verilerin analizinde betimsel analiz kullanılmıştır. Araştırmaya katılan okul öncesi öğretmenlerinin, 119'unun (%81'i), çevre/doğa/ekolojik okuryazarlık vb. konularla ilgili herhangi bir sivil toplum kuruluşuna üye olmadığı, üye olan 28 (%19) öğretmenin ise çoğunlukla TEMA Vakfına üye olduğu görülmüştür. Öğretmenlerin 86'sı (%55.5) daha önce ekolojik okuryazarlık kavramını duyduğunu ifade ederken, 69'u (%44.5) duymadığını ifade etmiştir. Öğretmenlerin yaptığı ekolojik okuryazarlık tanımlarının alanyazın ile benzer olduğu görülmüştür. Öğretmenlerin örnek olayla ilgili verdiği cevaplardan genel olarak bilgi düzeyinde ekolojik okuryazarlığa sahip oldukları, ancak bilgi boyutunun davranış boyutuna ne derece yansıdığı araştırılması gerektiği sonucuna ulaşılmıştır. Buradan yola çıkarak okul öncesi öğretmenlerine yönelik ekolojik okuryazarlık eğitimleri düzenlenebilir.

**Anahtar Sözcükler:** Okul öncesi dönem, çevre eğitimi, sürdürülebilirlik, ekolojik okuryazarlık.

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## Introduction

In its most general sense, literacy is defined as the cover term for the “ability to read and write something”, but the notion of environmental literacy in the field of environmental education has a different meaning. This concept, which was first defined by Roth in 1968, appears as a term describing the level of knowledge and awareness of the individual. Then, environmental literacy was defined by Orr (1992) as an understanding of the interaction of people and societies with their natural environments. Later, drawing on the concept of environmental literacy, Orr (1992) expanded this concept and coined the term “ecological literacy” in place of environmental literacy. According to him, ecological literacy involves knowing about the environment, caring about it and applying this knowledge into practice. Noviana et al. (2018), ecological literacy requires awareness of preserving nature. In our country, TEMA Foundation, which strives to foster ecological literacy, defined "ecological literacy" as the understanding of natural processes on earth and exhibiting knowledge, skill, and attitude towards nature (TEMA, 2013a). When all the definitions of “ecological literacy” are examined closely, it is seen that they are anonymously emphasizing environmental knowledge should be reflected to behaviour.

Upon examination of literature, it was seen that while the concept of environmental literacy is frequently used in domestic literature, "ecological literacy" or "ecoliteracy" stand out as the most used terms in foreign literature (Hempel, 2014). In the study by McBride, Brewer, Berkowitz and Borrie (2013), the meaning of environmental literacy and ecological literacy were discussed, and it was found out that ecological literacy and environmental literacy are mainly different from each other, but they overlap on several points. In literature, environmental literacy appeared as a cover term describing a mixture of ecological literacy and citizenship literacy. Moreover, ecological literacy was regarded as a subset of environmental literacy.

The Center for Ecoliteracy (2013) proposed four dimensions for ecological literacy: cognitive/head, affective/heart, action/hands, and spirit/connection as explained hereunder:

*Cognitive/Head domain* refers to the ability to analyze, think, evaluate, predict the possible. impact/ or consequences of a behaviour on the environment.

*Affective/Heart domain* refers to the ability to love, respect and empathize.

*Action/Hands* covers the behaviors that contribute to sustainability.

*Spirit/connection* refers to the ability to perceive and admire the natural events such as the color of the night sky and the return of the seasons.

Head, heart, hands and spirit work for a sustainable society in an individual with improved ecological literacy skills. Therefore, the ecological literate individual; is an individual who sees himself/herself as a part of nature, who is in harmony with nature and who is aware of consequences of his/her actions on nature (TEMA, 2013b). To illustrate, it is not correct to say that the individual is ecological literate if the individual only knows the properties of the stones but fails to recognize the stones when he is in nature. The ecological literate individual can examine the stone just like a scientist (Kaya & Kazancı, 2009). Aside from these, individuals, who is critical of environmental issues, search about environmental issues, question, find solutions to environmental problems and see themselves as a part of nature, can be described as ecological literate.

According to OECD (2009) report, ecological literacy is a critical skill for human survival and survival in the planet in harmony. For this reason, children should be taught from a very young age that resources on the planet are limited and that they must live in harmony with nature (Cutter-Mackenzie, Edwards, Moore & Boyd, 2014). Orr (1992) emphasizes that ecological literacy starts in early childhood. In similar vein, in the study of Aydın, DüNDAR and Korkut (2016), teachers stated that for future generations to be ecological literate, ecological literacy should be given as a life philosophy instead of a lesson. Considering a lifespan where unlimited wishes and needs of individuals appear despite limited resources, ecological literacy stand out as an indispensable skill for a sustainable life (Uzday-Pirili et al., 2019).

Whether children can be ecologically literate depends mainly on ecologically literate teachers. In this vein, Concoran's (1999) study demonstrates that teachers who correlates with nature are typically motivated to transmit their experiences to their students. Likewise, the study conducted by Smith-Sebasto (2007) has put forward that the teachers equipped with diverse experiences such as camping and boating as a child tend to be eager to pass on such occurrences. That is why, it is crucial that teachers themselves need to establish a bond with nature so that they could practice a smooth integration of their past experiences into the activities held inside and outside the classroom. For this reason, TEMA organized teacher trainings with the aim of fostering ecological literacy for the first time in 2011 in Yalova (TEMA, 2013a). The project aims to raise teachers who love nature and understand the language of nature, attempting to train ecological literate students. In similar vein, with the cooperation of the Ministry of National Education and the Ministry of Health, the children and

their teachers who received preschool education in 2018 visited the Botanical Garden of The Grand National Assembly of Turkey within the scope of the Ecological Literacy for Sustainable Life Project in order to gain ecological awareness and a positive attitude towards nature (MEB, 2018). Preschool teachers were expected to transfer their knowledge and skills to children after receiving education on issues such as ecological literacy, basic principles of ecology, basic principles of ecological literacy, and forest ecosystem. As Çimen and Benzer (2019) argued, teachers possess great responsibilities in raising environmentally sensitive individuals. In this light, individual attitudes towards ecology can be relevant to both their parents' and their teachers' attitudes and behaviors, since they learn via modelling and experience in this sense (Musser & Diamond, 1999). Therefore, teachers can contribute to the ecological literacy of children by displaying environmentally friendly behaviors. For instance, the following actions can be done to develop children's ecological literacy: asking questions about nature, planting seedlings with children, collecting recyclable materials, organizing field trips to nature, stimulating their sense of curiosity, setting an example for children by being curious. Especially today, instead of being in touch with nature, children are intertwined with technology at home, severing all ties with nature (Fisman, 2001; Louv, 2005; White, 2006). Children's' decreasing interaction with nature inhibits the development of ecological literacy skill (Orr, 1992). Therefore, more attention should be paid to improving children's ecological literacy skills. In this respect, it is of paramount importance for preschool teachers, who are the first teachers of children, to possess knowledge about the environment and these to be reflected positively to their attitude and behaviour to be a positive role model for children because children learn most of the behaviours through role models. When the studies conducted in the literature were examined, it was revealed that the concept of environmental literacy was frequently examined using university students and teacher candidates (Timur, Yılmaz, & Timur, 2014), and there were also limited studies on ecological literacy (Aydın, Dündar & Korkut, 2016) and existing studies were mostly from different disciplines such as economics (Erciş & Türk, 2016). In this sense, this research attempts to contribute to the literature by emphasizing the concept of ecological literacy in preschool period and conducts the research with participants of preschool teachers.

Hence, this study aims to examine the knowledge and awareness levels of pre-school teachers on ecological literacy skills. For this purpose, the following research questions were formed:

- How do preschool teachers define ecological literacy concept?
- What are the views of pre-school teachers upon ecological literacy given a specific case?

## **Method**

### **Research Design**

In this research, basic qualitative research design, which is one of the qualitative research methods, was applied. Through basic qualitative research design, which is frequently used in the field of education, the main aim is to reveal existing situation (Büyüköztürk, 2012; Karasar, 2017), and to discover how individuals attach meaning to the event or concept discussed (Merriam, 2018). In this research design, where existing but undiscovered meanings are revealed, data is collected through observation, interview, and document analysis. For this reason, this particular approach was utilized in the research to reveal and interpret the preschool teachers' notion of ecological literacy.

### **Participants**

An online questionnaire was formed to collect the data from preschool teachers. To that end, pre-school survey was shared in social media platforms where preschool teachers interact with one another actively. By doing so, preschool teachers from various provinces of Turkey could fill up the survey. Therefore, among purposive sampling techniques, convenient sampling has been utilized, which is regarded as a prevalent, fast, and practical option when it comes to working with sample that is available to the researcher, especially in qualitative studies (Yıldırım & Şimşek, 2018). This study was carried out with pre-school teachers working in different provinces and districts and pre-school teachers with different years of professional experience. A total of 155 pre-school teachers were reached, of which 150 are female and 5 are male. When the professional experience period of the teachers was examined, it was seen that they had at least 4 months and at most 37 years of experience. The average of professional experience was found 9.5 years. The teachers participating in the research were given codes such as T1, T2 by taking the ethical principle into consideration and thus their identities were kept anonymous.

### **Data Collection Tools and Procedure**

In the present study, an online questionnaire form consisting of two parts, demographic information and instance event questions, was used as one of the data collection tools. While creating the interview questions, four field experts who worked in the field of environmental education in the preschool

period were consulted to set forth their views. Upon consultation, it was anonymously decided that the concept of ecological literacy is a novel concept, and; therefore, the concept would be more easily understood by preschool teachers via instance event. For this reason, a short instance event and six open-ended questions were written about the Australian Fire, which is very recent and compelling case. The teachers were presented with the following instance event: “When Doğa teacher came home that day, she went to the living room to watch the evening news. Whenever he opened the channel, Doğa teacher kept seeing the same news every time: "Why Australian fires cannot be extinguished for four months?", "The country is in horror," "The worst is yet to come." The TV reporter said that, according to the latest announcement of the World Foundation for World Protection (WWF) Australia, 1.25 billion animals, especially koala and kangaroos died along with at least 25 people and 8 million hectares of forest area disappeared while two thousand houses turned into ashes. The country authorities chalked the camels up and announced that they will kill 5,000 camels because they drink too much water.” The following questions were prepared to ask the teachers about this instance event:

1. How would you feel when listening to this news?
2. In your opinion, what are the cause/ causes of Australia fires?
3. If fires occurred in our country as in Australia, what would you do to extinguish the fires?
4. How would you explain the impacts of Australia fires on the world?
5. In your opinion, what should be done to prevent fires in Australia from happening again?
6. How would you evaluate the country authorities’ statement that camels should be killed to prevent fires?

Based on the field experts’ opinions, “Do you have membership in any non-governmental organization related to the issues of environment / nature / ecological literacy etc.” were added to the demographic question form and the participants were asked to answer the following question: "Have you taken lessons on environmental education during your undergraduate / graduate education?" Regarding instance event questions, the following question considered to be used, "What do you do to extinguish fires in Australia?" were not included and instead the following question was formed: “If fires occurred in our country just like in Australia case, what would you do to stop the fires?” After the questions were finalized, the ethics committee permission was obtained, and the data were collected in June 2020.

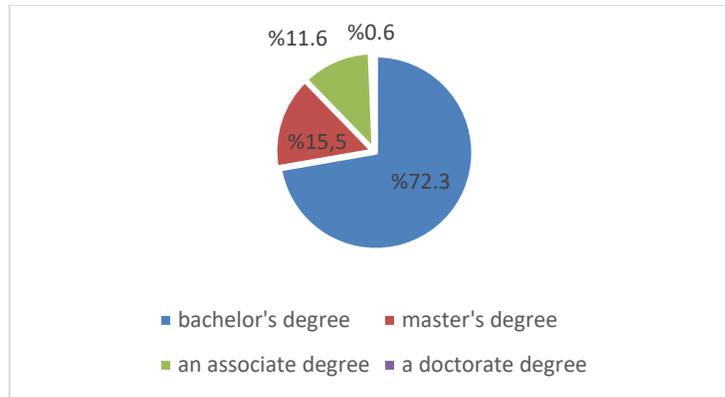
## Data Analysis

Descriptive analysis was used to analyze the data. Descriptive analysis is more superficial than content analysis. According to this approach, the data obtained are summarized according to the previously determined theoretical framework or research questions. The opinions of the individuals are presented in a striking way by integrating verbatim extracts derived from the data. The major aim is to present the findings to the reader properly and to make interpretations (Yıldırım & Şimşek, 2018), improving the overall validity of the research. Besides, to ensure the reliability of the research, the researchers examined the codes independently and then they agreed on the themes. Miles and Huberman's (1994) reliability formula ( $\text{Reliability} = \frac{\text{Consensus}}{\text{Consensus} + \text{Disagreement}}$ ) was used and the reliability coefficient was determined to be 0.96.

## Results

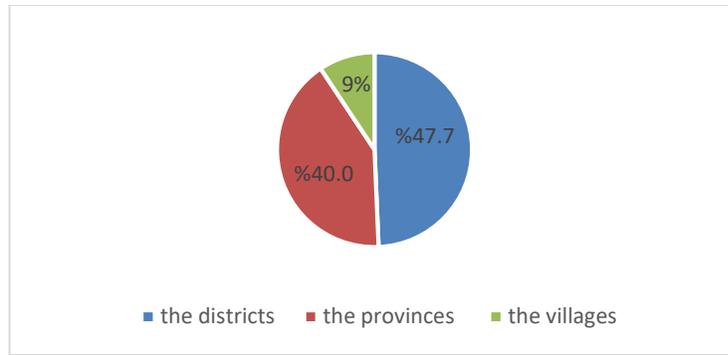
### *Results upon Demographic information*

A total of 155 pre-school teachers constituted the sample, of which 150 are female and 5 are male. Pre-school teachers, who participated in the research, mainly held bachelor's degree ( $n=112, 72.3\%$ ), whereas some held a master's degree ( $n=24, 15.5\%$ ), some held an associate degree ( $n=18, 11.6\%$ ), and one participant held a doctorate degree ( $n=1, 0.6\%$ ) ( Fig. 1).



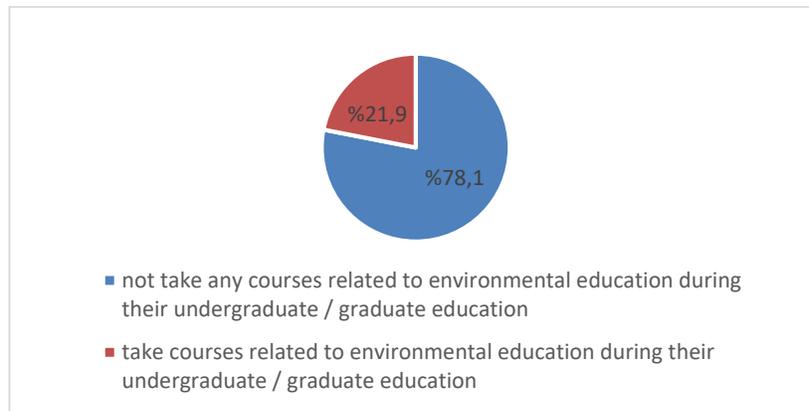
**Figure 1.** Education level

The respondents (pre-school teachers) of the survey have been currently working in different provinces of Turkey. Aside from those who work mostly in metropolitan cities such as Istanbul and Ankara, there are also teachers working in smaller cities such as Kars and Mardin. According to Figure 2, 47.7% ( $n=74$ ) of the respondents work in the districts, 40.0% ( $n= 62$ ) work in the provinces and 9.0 % ( $n=14$ ) of these work in the villages.



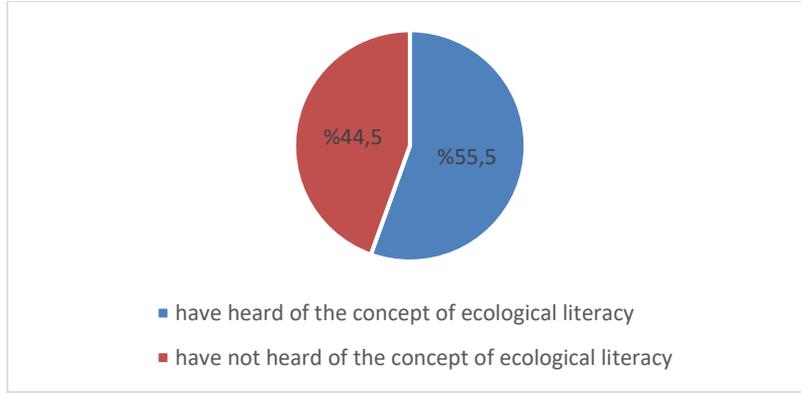
**Figure 2.** Percentage of workplace

As presented in Figure 3, 121 (% 78.1) of respondents did not take any courses related to environmental education during their undergraduate/graduate education while 34 (21.9%) of respondents reported they received such courses. When the contents of the courses were examined, T91, T117 and T142 stated that they take Environmental Education in preschool period, T139 took Children and Environment lesson, and T22 TEMA, T37, T44 Ecology, T75 and T155 stated that they attend the seminar of Forest Schools.



**Figure 3.** Distribution of receiving courses related to environmental education

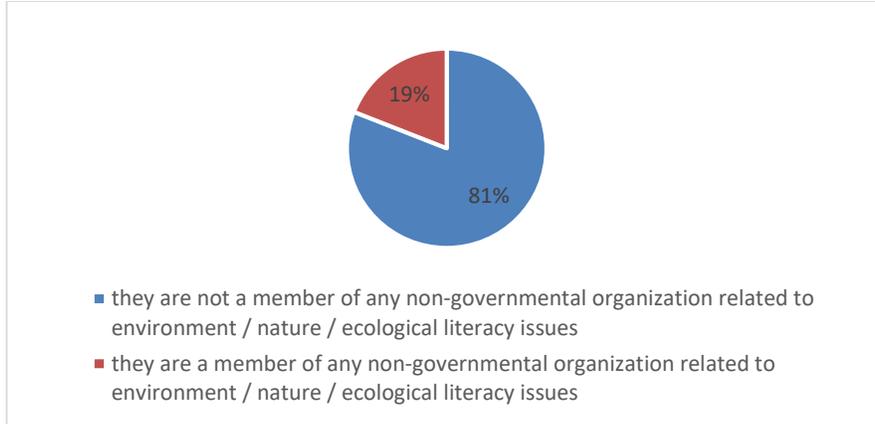
As shown in Figure 4, 86 (55.5%) of the respondents stated that they have heard of the concept of ecological literacy before, while 69 (44.5%) stated that they do not recognize the concept.



**Figure 4.** Percentage of people who have heard of the concept of ecological literacy

When teachers' definitions of ecological literacy were examined, it was seen the teachers came up with various definitions as given in below:

T25 "*Understanding what is happening in the environment and nature*", T27 "*To adopt the principle of living in harmony with nature*", T31 "*Natural events that enable us to live on earth, to understand nature*"; T155 "*To possess the ability to understand the ecosystem*". In similar vein, T81 defined ecological literacy in line with the definitions made above: "*Having the ability to understand the natural cycles and ecosystem that make life possible on earth*". T102 came up with a different definition than the ones above and defined the concept as follows: "*The ability to understand the difference between waste and garbage, and the ability to understand and apply how much recycling is essential*". T138 put emphasis on three dimensions: "*From the world we live in to our close (imminent) environment, ecological literacy involves follow-up, awareness and actions based on our knowledge of nature*", and T141 answered this differently than others by emphasizing importance of taking actions rather than knowledge without actions: "*To pursue, to spend effort and act in order to live in harmony, believing sustainability of life.*" Apart from these, T122 stated, "*I need to be informed.*", and similarly, the following respondents failed to define the concept: T121 "*I am not very knowledgeable on this topic*", T139 "*I heard it but I have not searched about it*", T108 "*I cannot define it*", and lastly T111 stated, "*I have no detailed information about this subject, maybe, creating awareness and carrying out activities / projects in order to live in harmony with the environment and nature.*", thus indicating a need further information upon the subject.



**Figure 5.** Percentage of membership to civil society organizations

As shown in Figure 5, 119 (81%) of the respondents expressed that they are not a member of any non-governmental organization related to environment/nature/ecological literacy issues and 28 (19%) of the respondents stated they are. Among these organizations, (n= 23) of teachers stated they are members of TEMA Foundation, Nature Assosication (n=1), World Wildlife Fund (WWF) (n=1), Simurg Bird's Nest Association (n=1), Wheat Association for Supporting Ecological Living (n=1).

### **Results upon the instance event**

When the first question, “*What do you feel when listening to this news?*”, it was seen that teachers provided similar answers, such as sadness, anxiety, fear, anger, and helplessness. In line with responses, it can be concluded that the theme of negative emotions emerged: T26 “*I got goosebumps*”, T53 “*I felt really sorry and I wish I could do something.*”, T85 “*I was hurt. I think the global balance of the world is deteriorating.*”, T67 “*I have seen that mankind continues to be selfish for his own life. I was ashamed of my own kind. I was embarrassed that my own kind was loveless.*”

T139 “*I am afraid that there will be days soon when we cannot breathe*” and T128 stated “*I am deeply sorry for the destruction of innocent creatures, humans and lungs, and at the same time, I think and get angry about how dangerous a human being is because he prepared this end and tried to cut the bill to other creatures. Also, I consider humankind deserve such disasters as this one happened due to being spoiled.*”

Initially, the concepts of “human beings, indifference, insensitivity, neglect, global warming, and irresponsibility” were among teachers’ answer to second question: “In your opinion, what are the cause/ causes of Australia Fires?” The following three themes were formed later that involved initially discussed issues: human, global warming and state-originated. T13 stated:

*“What I have read and learn up to now indicates global warming as the main reason of Australian Fires. This situation caused by mainly by humankind; because of rapid transition from productive society to a consumer society, these I believe, have disturbed the balance of the nature.”*

T34 *“What we did to world”,* T44 *“We act against the world”,* T77 *“I think this is absolutely not because of camels. Man harms the environment for his interests. He can even be daring to put the blame on a camel.”* T95 *“The biggest share is human beings.”* T143 made a length explanation that emphasized fires are triggered mainly by humans with these words:

*“There are some rumours suggesting that these fires are human-caused fires and I think it is not impossible. The whole world needs space for the animal industry which is one of the destructive factors and a branch of consumption madness in todays’ world. Apart from that, it was caused, if not indirectly, by human because we have disrupted the balance of the whole world. We caused global warming due to reasons such as animal industry, carbon emission, etc., and the overheating and reflection of a piece of glass on the forests thus brought this result.”*

T119 expressed, *“Drought, excessive temperature caused this”,* T106 *“Global warming triggered fires, and made it difficult to extinguish.”* T62 stated that the cause are *“Global warming and deterioration of ecological balance”*. T57, on the other hand, suggested that *“Fires may be politically motivated. Every reasonable person can realize this. This may also be valid in Australia. Together with high temperatures and negligence, the result brought this inevitable disaster.”* In similar vein, T92 stated *“Mankind has come to be so selfish that it might even for rents.”*

Based on the teachers’ answers to third question: *“If fires occurred in our country as in Australia, what would you do to extinguish the fires?”*, three major themes were formed: physical aid, financial aid, and social aid. T81 stated:

*“I would try to do anything, (if necessary) I could carry water from my home, keep animals in a private space and try to help them.”* T129 *“I would run for help ... I don't know what I would do at that moment, but I would do whatever it takes to help... I would like to try to heal the wounds of animals. Or I would dare to go to forest and take them out of fire”*.

T116 *“I would help as much as I can, and I would literally do anything to help.”* Some teachers stated that they can provide financial aid. T8 *“I can make a donation.”* T66 *“If there were aid campaigns in such organizations, I can donate them.”* and T117 *“I would donate to the CSO organizations.”* T97 stated that he would provide social assistance as follows: *“I would participate in the charity movement*

of civil society organizations.” T36 “One cannot stop a disaster alone; I would help by calling for unity and I would encourage people to take actions” and T115 “I would provide with the necessary resources and give moral support by collaborating with non-governmental organizations.” On the other hand, some of the teachers stated that they cannot do anything in case of fire. T150 “I suppose I would get panic since I am inexperienced about fires, and I wouldn't know what to do.” T122 “I don't think anything personal can be done.” T84 “I wouldn't do anything.” T46 “I guess I wouldn't do anything if I haven't done anything up to this time.”

Teachers' responses to the fourth question: "How would you explain the effects of Australian Fires on the world?" formed the theme of “global issues” based on the rationale that fires lead to problems on a global level. T15 “It caused the disruption of ecological balance all over the world.” T29 “Every disrupted order would affect the whole world order. We are preparing our own end.” T44 “It would affect all continents negatively as a result of climate change and ecological deterioration.” T55 “Our lungs have disappeared, and an irreversible process has begun. The world will experience all the bad consequences, especially climate change.” T134 “Many lives of animals were lost and therefore I believe the balance of the world were lost.” T129 stated:

“The fact that nature is at the edge of disappearance means the balance of the world will get disrupted. The human beings have seen the consequences of its waywardness. How conscious they are now is a matter of question. Many living species have faced extinction, and the balance of nature has been already disrupted, and now we are paying the penalty with the virus we are currently faced with. Nature takes her revenge.”

T91 stated that fires positively affect peoples' actions by raising awareness. “We have gained sensitivity towards nature.” T81 stated:

“When all these were happening, people put important news on social media to increase awareness of people. Yes, our awareness can be increased this way, but this can be just momentary. In order to make this awareness permanent, it is not necessarily we should experience the same event. Therefore, education should begin at an early age.”

T64 stated as follows:

“An Instagram page that I followed donated all the proceeds of the koala toys he made to the Australian fund. This means that the world is more prone to think positively and take precautions for negative consequences of natural disasters in the most effective way.”

The themes of precaution and awareness were elicited as the major themes based on teachers' responses to the fifth question: “In your opinion, what should be done to prevent fires in Australia from

happening again?” T97 drew attention to the pre-school period education to raise awareness with regard to protection of nature and environment with these words:

*“This should be taught in lessons, not just through activities. In the years when I studied secondary education, there was an agriculture lesson. It was very useful for students to get to know nature. Today, lessons can be incorporated into curriculum by making need analysis and considering plans for futures.”*

This statement also indicated a need for courses related to environment in undergraduate programs.

T82 stated as follows:

*“I think that more awareness-raising campaigns should be conducted, and bad events should be constantly reminded. I think family education is even more important than education of children. Because the child sees his/her parents as role models and acts like them. I think that projects with family participation will be more beneficial for ecological literacy.”*

T100 *“The importance of respecting every living creature's right to life in the ecological system should be explained and taught. Starting from the basic, pet and plant breeding workshops for ecology should be opened in schools.”* Some of the teachers explained what can be done to raise awareness. In this regard, T95 stated, *“A more conscious society, a more conscious world!”*, T25 *“All the countries can encourage their citizens to gain environmental awareness. Municipalities, schools, universities can be the first places where these studies start off”*, T34 *“They should be more conscious. Seedling campaigns can be organized, the number of security guards can be increased in the forests as much as possible, and training must be provided to people.”* Regarding precautionary measures, the teachers provided important statements. T11 reported as hereunder:

*“The law of nature, which obliges the world to obey the rules, should be implemented very quickly. We can save the day only by the struggle of people individually. I think we will not leave a world where our children can live if people continue to act this way.”*

T98 exemplified the precautionary measures as follows:

*“Undoubtedly, we should try to control global warming first: we should revise our consumption habits, live more minimalist, and should not encourage factories to produce non-stop. The smoke emission of the factories should be strictly controlled by the states, exhaust gas measurements should be done meticulously, we should adopt natural energy generation ways (such as wind / solar energy). And we should plant more trees and spend the resources in a more controlled way.”*

T8, instead of raising awareness and taking precautions, the teacher stated, *“There is nothing we can do from here (for Australia) because it is a problem that has been going on persistently for years.”* and T137 *“I hope we are not late, but I am quite pessimistic.”* These two statements show that they did not find a solution in order to avoid the fire.

The responses of the teachers to the sixth question: *“How would you evaluate the country authorities’ statement that camels should be killed to prevent fires?”* were mainly composed of negative evaluations including brutality, massacre, and lack of reason, selfishness, and absurdity. T98 stated, *“Disaster, mind keeping, brutality!”*

T127 summarized that this decision is literally a massacre:

*“I think that they are simply murderer and they are wild creatures themselves and that they must be killed then. If we compare the water consumed by those animals and the water consumed by a person, should the camels die in this world considering the extent a person pollutes nature? Do not they cause the real mess because of their dirty thoughts?”*

T65 stated this decision is selfish, *“I think it is selfish. This is not the only solution. If they wanted to, they could take camels to other countries by ship.”* T64 found the decision unreasonable: *“I found it ridiculous cause everyone is drinking water. Then everyone drinking water should be killed!! Illogical.”* T143 said that the idea is utterly ridiculous: *“I have not seen such a ridiculous idea in my life. A man of logic should not put the blame of a disaster on an innocent creature. They found excuses.”*

T140 came up with a more reasonable solution:

*“Oh my God! There's a reason for existence of every living thing. Everyone has a duty in the world. Destroying camels will surely pose another problem. Similar examples were experienced. It is absolutely necessary to protect species and raise nature-friendly people!”*

Similarly, T130 said, *“They could have thought a smarter solution. They could even make money by selling camels to the countries that wanted them. There are countries that need camels.”* Unlike other teachers, T56 expressed, *“It's a sad event. But I think it is a must.”* T14 similarly said, *“Although it initially received a lot of reaction, it was a solution.”* T3 surprised and said, *“I hear this news now”*, stating he heard of this situation for the first time. Similarly, T10 stated, *“I have no information on whether or not it is necessary. Maybe they are right. If necessary, it can be considered as cutting hand to save arm.”* T15 *“Maybe they are right, I don't know. Water is precious. It might have been insufficient to put out the fires.”*

### **Discussion, Conclusion and Recommendations**

The main purpose of this research is to examine the ecological literacy knowledge and awareness levels of preschool teachers. 121 (78.1%) of the pre-school teachers who participated in the study stated that they did not take environmental education courses during their undergraduate/graduate education, while 34 (21.9%) stated that they took environmental education courses. It is a major deficiency that most teachers did not take a course on environmental education during their undergraduate/graduate education. This shortcoming was partially overcome by the verdict of The Council of Higher Education in 2018. In this vein, the undergraduate programs were updated, and Early Childhood Environmental Education course was added as an elective course to the Pre-School Education undergraduate program. Taking a course on environmental education is one of the factors that can increase teachers' knowledge and awareness of ecological literacy. As a result of the study carried out by Özyürek et al. (2019), it was observed that there was no significant difference between all the sub-dimensions of environmental literacy according to the prospective teachers' enrolment in environment related courses during their undergraduate education. Similarly, in the study conducted by Koç and Karatekin (2013) with geography teacher candidates, it was observed that the variable of taking environmental education courses in the university did not affect the environmental literacy levels of teacher candidates. However, the other studies in literature indicated the pre-service teachers/students who take courses on environmental education have higher knowledge levels regarding environmental issues (Altınöz, 2010; Büyükkaynak & Aslan, 2019; Karatekin & Aksoy, 2012; Kayalı, 2010; Sam, Gürsakal & Sam, 2010; Owens, 2000; Uyanık, 2016; Uzun & Sağlam, 2007; Yavetz, Goldman, & Pe'er, 2009). For this reason, to add mandatory courses related to environmental education to all teacher undergraduate programs will be an important facilitator in raising sustainable societies. However, it should be kept in mind that environmental education courses in the program should not only focus on the cognitive dimension but also target the affective and behavioral dimensions (Koç & Karatekin, 2013). In the studies conducted by Şenel (2010) and Şahin, Cerrah, Saka and Şahin (2004) with teacher candidates, it was found that environmental lessons, which are based on active learning, contribute to the development of environmental awareness. Similarly, in the study conducted by Muliana et al. (2018), it was stated that students' knowledge of ecology could not improve only with lessons but could develop through experiences.

As a result of the present research, 119 (81%) of preschool teachers expressed that they are not members of any non-governmental organizations related to the issues of

environment/nature/ecological literacy etc. whereas 28 (19%) stated that they are members. The fact that the majority of teachers are not members of any environmental non-governmental organizations may be due to their low interest to environmental issues. The study conducted by Erbasan and Erkol (2020) demonstrated that the attitudes of classroom teachers towards environmental problems did not change according to the membership status of the non-governmental organization related to the environment. In other studies identified in the literature, similar results were obtained (Aksu, 2009; Karatekin, 2011; Uzun, 2007; Ürey & Şahin, 2010). However, there are also studies in the literature showing that being a member of an environmental non-governmental organization has an impact on environmental literacy levels (Büyükkaynak & Aslan, 2019; Koç & Karatekin, 2013; Shean & Shei, 1995). Being a member of an environmental non-governmental organization, participating in activities such as planting trees and collecting waste are among activities that will increase the level of ecological literacy of individuals. However, since there are various results in the literature, the variable of being a member of non-governmental organizations should not be considered as the decisive factor in the attitude towards the environment. Additionally, when pre-school teachers' membership to institutions were considered, TEMA Foundation (N=23) was the one many teachers are member of, and this may be due to the TEMA's activities for preschool education and the Little TEMA program it exclusively prepared for preschool children.

As a result of the research, 86 (55.5%) of preschool teachers stated that they have heard about the concept of ecological literacy before, while 69 (44.5%) stated that they do not. When the definitions of the teachers, who stated that they heard the concept of ecological literacy, were examined, it was seen they made definitions similar to the ones found in the literature, and this may indicate the teachers have knowledge about this concept. For example, while T143 emphasized the knowledge dimension of ecological literacy as "*The ability to understand and analyze nature and our environment*", T141 emphasized behaviour dimension: "*To pursue, to spend effort and act in order to live in harmony, believing sustainability of life.*" Ecological literacy is a skill that includes all dimensions such as knowledge, awareness, attitude and behavior. And the fact that a considerable number of teachers stated that they did not hear this concept before, and the following statements such as these: "*I need to be informed.*", "*I am not totally knowledgeable.*", "*I heard but did not search about it before.*" and "*I cannot make a definition.*", showed that teachers are not equipped with sufficient knowledge: Apart from this, T44 stated, "*It is an article about nature.*" Or "*It is following the current events.*" and such irrelevant statements as these show that people are in need of information about ecological literacy.

When the teachers' responses to the instance event questions were examined, where they stated what they feel when they heard the news about the Australian fire, it was seen the majority of them expressed negative emotions such as sadness, anxiety, fear, anger, anger, desperation, and additionally, they also discussed the reasons such as "indifference, insensitivity, neglect, global warming" about the causes of fires, and especially emphasized that mankind are the main responsible of this. Similarly, in the study of Erdaş- Kartal and Ada (2019) with pre-school pre-service teachers, teacher candidates stated that environmental issues are human-caused and people' awareness should be increased. In Çimen and Benzer (2019), the experienced insufficiencies in knowledge and awareness-raising activities are shown as the main cause of environmental issues that arise in our country. One of the instance event questions is: *"If fires occurred in our country as in Australia, what would you do to extinguish the fires?"* and some of the teachers' responses to this question were: *"Anything I can do."* This showed that teachers are in the opinion that they can help by financial aid such as setting up mechanisms to extinguish the fire, or by actually taking part in the extinguishing work, and also by planting seedlings after the fire, and by donating and most importantly, they consider that it is of paramount importance to encourage individuals in the society to take actions. Apart from this, some of the teachers consider they cannot help, and as T15 expressed, *"I leave this job to professionals."*, some hold the opinion that it is not their duty, but professionals. T122 similarly held the idea that *"I don't think anything personal will be done."* *"I wouldn't do anything."* and T46 also stated that *"I think if I had not done anything for fires up until now, I don't do now."* The answers show that some of the teachers were rather insensitive to environmental issues thinking that it is not their responsible.

In the study conducted by Nur-Sezer and Gümüštepe (2016) with the students studying in the department of child development, it was seen that the students are sensitive to environmental pollution and protecting the nature, but they feel insufficient in term of putting what they know into practice. It was also seen that teachers are aware of the global effects of the fire in Australia such as disrupting the food chain, and reducing species in their countries, and some of the teachers expressed they are very concerned about this situation. In addition to negative effects of fire, teachers stated that the global effects of Australia fire have a positive effect by raising awareness of people. In order to prevent fires in Australia from happening again, some of the respondent's expressed that they attach importance to awareness-raising activities and precautionary measures. In this regard, the following measures should be taken: children should be made conscious about these, particularly in pre-school period education with parents' active involvement to the process, environmental courses should be included in

undergraduate programs and people should live as environment-friendly by making some changes in their lives. However, it is remarkable that none of the preschool teachers emphasize the role of teachers in this process. Although the teachers emphasized the importance of education in solving the problems, they did not talk about what they can do, and search the solution in their environment. In the study by Noviana et al. (2018), it was emphasized that teachers should take responsibility for developing ecological literacy in students. In the study of Özkan (2017) with pre-school teachers, the respondents stated that they have great responsibilities to teachers, families, media, and non-governmental organizations in combating environmental problems issues through environmental education. Similarly, in a study conducted by Muliana et al. (2018), it was indicated that students obtained their environmental knowledge mostly from media sources such as internet and television. Pilgrim, Smith and Pretty (2007) stated that informal sources are more effective than formal sources (i.e. school) in acquiring information about ecological literacy. As a result of the study conducted by Koç and Karatekin (2013), it was observed that geography teacher candidates who have high environmental awareness in their families have higher environmental awareness than those who do not. This result highlighted the importance of the family in environmental education. Apart from these, T8 made a statement of acceptance regarding the inevitability of fires with these words: *“There is nothing we can do in our situation because it is a problem that has been persistently going on for years.”* These words also illustrated insensitiveness to the environmental problem. Some of the teachers evaluated the authorities’ idea of killing camels to prevent fires as brutality, massacre, lack of reason, selfishness, and absurdity, and some stated that this movement may cause other problems in ecological balance. However, different from others, some of the teachers believed this might be necessary measure.

As a result, individuals must be ecologically literate to create a sustainable society (Desfandi, Maryani & Disman, 2017). In this study, pre-school teachers' ecological literacy levels were examined, and upon examination, it was revealed that most of the teachers are ecological literate at the level of knowledge. However, how much this ecological knowledge reflects to behavior is a matter of question and should be investigated further. Environmental literacy levels can be considered as an important indicator of the attitudes and behaviors of individuals towards environmental problems and the individuals’ combat with the environmental problems (Demirtaş, Akbulut & Özşen, 2018). When the literature in Turkey was examined, in the most of the studies conducted, the level of environmental literacy was seen to be not at the desired level (İstanbullu, 2008; Derman & Hacıeminoğlu, 2017; Ökesli, 2008; Tuncer, Ertepinar & Şahin, 2008; Soran, Morgil, Yücel, Atav & Işık, 2000; Yılmaz

Morgil, Aktuğ & Göbekli, 2002). Roth (1992), the father of environmental literacy, proposed three levels of environmental literacy: nominal, functional, and operational. At nominal environmental literacy level, individuals do not have much understanding about the workings of natural systems and their impact on human although there is an awareness and sensitivity towards natural systems. A person with functional level knowledge has knowledge about the functioning and interaction of natural systems. At the operational environmental literacy level, which is the upper literacy level a person can reach, individuals aside from having an in-depth knowledge of the environment; they have the habit of living in harmony with the environment. At this stage, rather than knowledge, environmental actions and behaviors are taken as basis (Sontay, 2013). What is expected from individuals is that the knowledge and awareness of the environment should be reflected to their behaviors, which is manifestation whether they are ecological literate at the operational level or not. Similar issues were emphasized in other studies in the literature (Büyükkaynak & Aslan, 2019; Koç & Karatekin, 2013). Erten (2005) found that the environmental knowledge and attitudes of teacher candidates did not affect their behaviors much, and additionally, inconsistencies between knowledge and behaviour were observed in the study. It takes time for environmental knowledge to be reflected to attitude and behavior. For this reason, ecological literacy trainings should be organized throughout the process to raise teachers with ecological literacy.

As a result of this study, the knowledge and awareness levels of ecological literacy of pre-school teachers were examined and based on this, the following recommendations can be offered:

- In-service trainings can be organized to improve the ecological literacy level of preschool teachers.
- Preschool teachers may be asked to be members of non-governmental organizations and associations working in the field of ecological literacy and participate to the studies of these organizations.
- Compulsory and elective courses related to environmental education can be incorporated into the Pre-School Education undergraduate program.
- It can be ensured that pre-school teachers participate in TUBITAK projects regarding the field of environment in order to increase the ecological literacy levels in terms of action.
- The misconceptions such as ecological literacy and environmental literacy in the field can be eliminated by developing a dictionary in the field of environmental education.

- In this study, based on the opinions of 155 preschool teachers, the knowledge and awareness of teachers regarding ecological literacy were examined. Future studies can assess to what extent the teachers' knowledge and awareness about the subject is reflected to behaviour.

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## Genişletilmiş Özet

### Giriş

Günümüzde yaşanan çevre sorunlarının temeline bakıldığında bireylerin çevreye karşı sorumsuz davranışlarının, bilgi eksikliğinin ya da yanlış bilginin var olduğu görülmektedir. Bireylerin bu olumsuz tutum ve davranışlarından kurtulabilmeleri ancak eğitim yolu ile gerçekleşebilir. Çevre eğitiminin en nihai amacında ise çevre okuryazarı bireyler yetiştirmek yer almaktadır. Bu nedenle insan yaşamının en kritik yılları olan okul öncesi dönemde çocuğa kazandırılması gereken bilgi ve becerilerden biri de çevreye saygı ve bakım duygusunu geliştirmektir. Eğer çocuklar, küçük yaşlardan itibaren çevre bilinci ve sevgisi ile yaşarsa yarının yetişkinleri olarak bu olumlu davranışları sürdürmeleri de kolaylaşacaktır. Bu noktada çocukların ilk öğretmenleri olan okul öncesi öğretmenlerinin, çevreye yönelik bilgi sahibi olmaları, bunların olumlu tutum ve davranışa yansımaları çocuklara olumlu rol model olmaları açısından oldukça önemlidir. Çünkü çocuklar pek çok davranış model olarak öğrenmektedir. Bu nedenle ekolojik okuryazar çocukların yetişmesinde okul öncesi öğretmenlerinin yeri oldukça önemlidir. Alanyazında yapılan çalışmalar incelendiğinde çevre okuryazarlığı kavramının sıklıkla üniversite öğrencileri ve öğretmen adayları kullanılarak incelendiği (Timur, Yılmaz ve Timur, 2014) ekolojik okuryazarlık kavramının yurt içi alanyazında yeni bir kavram

olduğu ve bundan dolayı sınırlı çalışmanın olduğu (Aydın vd., 2016) ve var olan çalışmaların çoğunlukla ekonomi gibi farklı disiplinlerden (Erciş ve Türk, 2016) olduğu görülmüştür. Araştırmanın bu anlamda okul öncesi öğretmenleri ile yapılarak ekolojik okuryazarlık kavramını vurgulaması açısından önemli olduğu düşünülmektedir. Bu araştırmanın amacı okul öncesi öğretmenlerinin ekolojik okuryazarlık becerisine ilişkin bilgi ve farkındalık düzeylerinin belirlenmesidir. Buradan yola çıkılarak aşağıdaki sorulara yanıt aranmıştır:

- Okul öncesi öğretmenleri ekolojik okuryazarlık kavramını nasıl anlamlandırmaktadır?
- Okul öncesi öğretmenlerinin örnek olay üzerinden ekolojik okuryazarlık kavramına ilişkin düşünceleri nelerdir?

## Yöntem

Bu çalışmada nitel araştırma yöntemlerinden temel nitel araştırma kullanılmış ve okul öncesi öğretmenlerinin ekolojik okuryazarlık kavramına yükledikleri anlam ortaya çıkarılmak ve yorumlanmak istenmiştir. Bu noktadan hareketle Türkiye'nin farklı illerinde çalışan 155 okul öncesi öğretmenine online anket formu ile ulaşılmıştır. Araştırmada veri toplama aracı olarak araştırmacılar tarafından hazırlanan demografik bilgiler ve örnek olayla ilgili altı açık uçlu soruyu içeren form kullanılmıştır. Araştırmacılar tarafından güncel bir ekolojik kriz olan Avustralya yangını konu edinen bir örnek olay yazılmış ve okul öncesi öğretmenlerinin bu örnek olayla ilgili sorulara verdikleri cevaplardan ekolojik okuryazarlığa ilişkin bilgi ve farkındalık düzeyleri belirlenmek istenmiştir. Verilerin analizinde ise betimsel analiz kullanılmıştır.

## Bulgular

Araştırmaya katılan 150 bayan, 5 erkek okul öncesi öğretmenin, 112'sinin (%72.3) lisans, 24'ünün (%15,5) yüksek lisans, 18'sinin (%11.6) önlisans ve 1'inin (%0.6) doktora mezunu olduğu, 114'nün (%77.6) lisans/ lisansüstü eğitimleri boyunca çevre eğitimi ile ilgili ders almadığı, 33'ünün (%22.4) aldığı görülmüştür. Öğretmenlerin 119'u (%81'i), çevre/doğa/ekolojik okuryazarlık vb. konularla ilgili herhangi bir sivil toplum kuruluşuna üye olmadığını ifade ederken, üye olan 28 (%19) öğretmenin çoğunlukla TEMA Vakfına üye olduğu görülmüştür. Öğretmenlerin 86'sı (%55.5) daha önce ekolojik okuryazarlık kavramını duyduğunu ifade ederken, 69'u (%44.5) duymadığını ifade etmiştir. Öğretmenlerin bazıları ekolojik okuryazarlığı; “Çevre ve doğada olup bitenleri anlayabilmek”, “Doğayla uyumlu yaşamayı ilke edinmek”, “Yeryüzünde yaşamamızı sağlayan doğal olaylar, doğayı anlamak” şeklinde açıklayarak alanyazın ile benzer tanımlar yapmıştır. Bazı öğretmenler ise “Bilgilendirilmeye ihtiyacım var.”, “Tam olarak bilgi sahibi değilim”, “Duydum ama

araştırmadım” şeklinde açıklamalar yaparak ekolojik okuryazarlık konusunda bilgi eksikliğini belirtmiştir. Örnek olayla ilgili öğretmenlerin verdikleri cevapları incelendiğinde; Avustralya yangını karşısında üzüntü, endişe, korku, öfke, kızgınlık, çaresizlik gibi duygular hissettikleri, yangının nedenleri arasında İnsanoğlu, tedbirsizlik, duyarsızlık, ihmal, küresel ısınma, sorumsuzluk gibi faktörleri ifade ettikleri, yangınların söndürülmesi konusunda fiziksel yardımda, maddi yardımda, sosyal yardımda bulunabilecekleri, Avustralya’da yaşanan yangınların öğretmenleri kaygılandıkları, yangınların yaşanmaması konusunda önlem ve bilinçlendirme çalışmalarının yapılması gerektiğini ifade ettikleri ve yangınları önlemek için develerin öldürülmesini vahşet, katliam, akıl yoksunluğu, bencillik şeklinde değerlendirdikleri görülmüştür.

### **Sonuç ve Öneriler**

Araştırmanın sonucunda öğretmenlerin örnek olayla ilgili verdiği cevaplardan genel olarak bilgi düzeyinde ekolojik okuryazarlığa sahip oldukları, ancak bilgi boyutunun davranış boyutuna ne derece yansıdığı araştırılması gerektiği sonucuna ulaşılmıştır. Çünkü ekolojik okuryazarlık, bilgi, tutum, davranış gibi pek çok boyutu içerisinde barındıran bir beceridir. Eğitimde istenen sadece bilgi boyutunda kalmayıp eylemsel boyutta ekolojik okuryazar bireyler yetiştirmektir. Bu anlamda okul öncesi öğretmenleri, çocuklara rol model olmaları açısından kritik öneme sahiptir. Öğretmenlerin büyük çoğunluğunun lisans/lisansüstü eğitimleri boyunca çevre eğitime yönelik bir ders almaması da dikkat çeken bir bulgu olarak karşımıza çıkmaktadır. Çevre eğitimi ile ilgili bir ders almak, öğretmenlerin ekolojik okuryazarlığa ilişkin bilgi ve farkındalıklarını arttıracak faktörlerden birisidir. Öğretmenlerin, büyük çoğunluğunun çevre ile ilgili herhangi bir sivil toplum kuruluşuna üye olmaması, çevreye yönelik ilgilerinin düşük olduğunu gösterebilir. Ayrıca, okul öncesi öğretmenlerinin hiçbirinin Avustralya yangınlarının çözümünde öğretmen rolünü vurgulamaması oldukça dikkat çekicidir. Öğretmenler, sorunun çözümünde eğitime vurgu yapsa da kendilerinin neler yapabileceğine dair herhangi bir açıklamada bulunmamış, çözümü çevrelerinde aramıştır. Bu noktada başlangıç noktamızdan biri okul öncesi öğretmenleri olmalıdır ve ekolojik okuryazarlık eğitimleri ile çevre hakkında bilgi sahibi olan, çevreyi seven, koruyan öğretmenler yetiştirilmelidir.

**Etik Beyan:** “The Investigation of Pre-School Teachers’ Ecological Literacy Knowledge and Awareness Level” başlıklı çalışmanın yazım sürecinde bilimsel, etik ve alıntı kurallarına uyulmuş; toplanan veriler üzerinde herhangi bir tahrifat yapılmamış, karşılaşılabilecek tüm etik ihlallerde “Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi Yayın Kurulunun” hiçbir sorumluluğunun olmadığı, tüm sorumluluğun Sorumlu Yazara ait olduğu ve bu çalışmanın herhangi başka bir akademik yayın ortamına değerlendirme için gönderilmemiş olduğunu taahhüt ederim.