



**REPUBLIC OF TURKEY  
ADANA ALPARSLAN TÜRKER SCIENCE AND TECHNOLOGY  
UNIVERSITY**

**INSTITUTE OF GRADUATE SCHOOL  
DEPARTMENT OF BUSINESS ADMINISTRATION**

**THE MEDIATING ROLE OF SUSTAINABLE LEADERSHIP ON THE  
RELATIONSHIP BETWEEN TEACHERS' ENVIRONMENTAL  
IDENTITY AND ENVIRONMENTAL ATTITUDE**

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MASTER OF BUSINESS ADMINISTRATION**



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**ADANA 2021**



I hereby declare that all information in this thesis has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all information that is not original to this work.

[Signature]

Yurdanur ÇALIŞKAN

# ABSTRACT

## THE MEDIATING ROLE OF SUSTAINABLE LEADERSHIP ON THE RELATIONSHIP BETWEEN TEACHERS' ENVIRONMENTAL IDENTITY AND ENVIRONMENTAL ATTITUDE

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This study aims to investigate the mediating role of sustainable leadership on the relationship between teachers' environmental identity and environmental attitude. The study also aims to examine teachers' environmental identity, environmental attitude and sustainable leadership levels in terms of demographic characteristics such as gender, age, marital status, education level, position etc., and general statements about the environment. The sample of the study consists of 449 teachers who work in schools in Adana from different branches of the profession. The data was obtained through surveys consisted of Environmental Identity Scale, Environmental Attitude Scale, Sustainable Leadership Scale, demographic information and general statements about the environment. The data was analyzed by the SPSS and SmartPLS programs. Partial Least Squares Structural Equation Modeling (PLS-SEM) method was used to examine the relationships among the variables and the mediating role. Frequency analysis, descriptive statistics, Independent Samples t Test, One Way ANOVA and Post Hoc Tests (Dunnett and Tamhanes' T2) were used in the data analysis. According to the results of the study, it was determined that the relationships among environmental identity, environmental attitude and sustainable leadership was found but the mediating role of sustainable leadership can not confirmed. According to demographic characteristics; it was observed that gender had an effect on teachers' environmental attitude and it was seen that position, job experience, and settlement had an effect on teachers' sustainable leadership. In terms of general statements about the environment, significant differences between groups were determined.

**Keywords:** Environmental Identity, Environmental Attitude, Sustainable Leadership

# ÖZET

## ÖĞRETMENLERİN ÇEVRE KİMLİĞİ VE ÇEVRESEL TUTUMU ARASINDAKİ İLİŞKİ ÜZERİNDE SÜRDÜRÜLEBİLİR LİDERLİĞİN ARACILIK ROLÜ

Yurdanur ÇALIŞKAN

İşletme Anabilim Dalı

Danışman: Doç. Dr. İ. Efe EFEOĞLU

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Bu çalışma, öğretmenlerin çevre kimliği ve çevresel tutumu arasındaki ilişki üzerinde sürdürülebilir liderliğin aracılık rolünü araştırmayı amaçlamaktadır. Araştırma ayrıca öğretmenlerin çevre kimliği, çevresel tutum ve sürdürülebilir liderlik düzeylerini cinsiyet, yaş, medeni durum, eğitim düzeyi, pozisyon vb. demografik özellikler ve çevreye ilişkin genel ifadeler açısından incelemeyi amaçlamaktadır. Araştırmanın örneklemini Adana'daki okullarda görev yapan farklı branşlardan 449 öğretmen oluşturmaktadır. Veriler, Çevre Kimliği Ölçeği, Çevresel Tutum Ölçeği, Sürdürülebilir Liderlik Ölçeği, demografik bilgiler ve çevre ile ilgili genel ifadelerden oluşan anketler aracılığıyla elde edilmiştir. Veriler, SPSS ve SmartPLS programları ile analiz edilmiştir. Değişkenler arasındaki ilişkileri ve aracılık rolünü incelemek için Kısmi En Küçük Kareler Yapısal Eşitlik Modellemesi (PLS-SEM) yöntemi kullanılmıştır. Verilerin analizinde frekans analizi, tanımlayıcı istatistikler, Bağımsız Grup t Testi, Tek Yönlü ANOVA ve Post Hoc Testleri (Dunnett ve Tamhanes' T2) kullanılmıştır. Araştırma sonuçlarına göre; çevre kimliği, çevresel tutum ve sürdürülebilir liderlik arasındaki ilişkiler tespit edilmiş ancak sürdürülebilir liderliğin aracılık rolü teyit edilememiştir. Demografik özelliklere göre; cinsiyetin öğretmenlerin çevresel tutumu üzerinde etkili olduğu gözlenmiş ve pozisyon, iş deneyimi ve yerleşim yerinin öğretmenlerin sürdürülebilir liderliği üzerinde etkili olduğu görülmüştür. Çevre ile ilgili genel ifadeler açısından gruplar arasında anlamlı farklılıklar tespit edilmiştir.

**Anahtar Kelimeler:** Çevre Kimliği, Çevresel Tutum, Sürdürülebilir Liderlik

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*“Science is the most reliable guide for civilization, for life, for success in the world.”*

*“Teachers: The new generation will be your masterpiece.”*

*Gazi Mustafa Kemal Atatürk*

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## ABBREVIATIONS

|          |                                                      |
|----------|------------------------------------------------------|
| EID      | : Environmental Identity                             |
| EAT      | : Environmental Attitude                             |
| SLE      | : Sustainable Leadership                             |
| REB      | : Responsible Environmental Behavior                 |
| EFA      | : Exploratory Factor Analysis                        |
| CFA      | : Confirmatory Factor Analysis                       |
| CV       | : Coefficients of Variance                           |
| KMO      | : Kaiser-Meyer-Olkin                                 |
| SPSS     | : Statistical Package for the Social Sciences        |
| PLS-SEM  | : Partial Least Squares-Structural Equation Modeling |
| CI       | : Confidence Interval                                |
| CR       | : Composite Reliability                              |
| AVE      | : Average Variance Extracted                         |
| HTMT     | : Heterotrait-Monotrait                              |
| RMStheta | : Root Mean Square Theta                             |
| SRMR     | : Standardized Root Mean Square Residual             |
| NFI      | : Normed Fit Index                                   |
| VIF      | : Variance Inflation Factor                          |
| VAF      | : Variance Accounted For                             |

# 1. INTRODUCTION

## 1.1. Background

The increase in human population, rapid and destructive development of industry and technology with the period of industry 4.0 have been caused environmental damage and environmental problems in the world. Although it is seen that environmental problems are mostly industrial and technological issue, it is partly attitudinal and behavioral issue as well. The immediate or potential utility of natural environment has lead to be seen valuable by the people (Clayton & Opatow, 2003, p. 4). Since people have started to value the environment, this value has given an insight to identity, attitudes, behaviors, ideas, personal and professional lives related to the environment. This awareness has helped people to concentrate more attention on the way that they care about environmental issues (Clayton, 2012; Efe & Baran, 2017; Staub & Green, 1992; Zelezny et al., 2000).

People have passion about the environmental issues, their believes to environment can affect other sides of who they are, and one's environmental position is seen as different than other's own can reveal an effective action (Clayton & Opatow, 2003, p. 1). Similarly, a passage from Hanh's (1987, pp. 71–72) book "Being Peace" indicate that people are imprisoned in their small self, they think only comfort of this small self but destroy their large self. His realization put that the sun is his heart, but this heart outside his body. His thought points out that either his body's heart or the sun put an end to its function, he does not survive. Therefore, his notice exhibits that all people should be able to be their own true self which means each person can be able to be the river, forest and even the sun of the natural world and himself or herself through reducing harm and providing benefit to the natural environment. The only way for non-dualistic seeing of this issue can be achieved through understanding, acting and hoping for the sustainable future. Following this, Blatt's view (2013, p. 468) expresses that Hanh's notice describes a connectedness to nature and a perception of being part of nature. Blatt sees this statement as an example of seeing one's relation to the environment which is called "environmental identity."

In other perspective, adopting an environmentally sensitive living area depends on the change of behavior and this change occurs through various factors that support environmental knowledge such as environmental identity (Kızılay & Önal, 2019, p. 272). The late realization of environmental problems has delayed the emergence of an environmental identity by the society (Öztarakçı, 2019, p. 18). With the recognition of environmental identity, it was observed that environmental identity plays an important role in learning and school (Tugurian & Carrier, 2017). In other sense, it supports the learning and knowledge for people to adopt environmentally friendly life. While doing this, it fills the gap between knowledge and behavior through its factors such as belief, value and attitude over environmental education (Önal et al., 2020, p. 750). The origins of environmental education have been come from 1960s and the environmental education movement grew rapidly through the period from 1970s to 1980s (Erol & Gezer, 2006). Since the World Conference on the Environment noticed environmental problems in Rio de Janeiro in 1972, researchers have been studying on environmental issues elaborately (Erol & Gezer, 2006).

## **1.2. Problem Statement**

When the published literature is reviewed, it is seen that studies which investigate teachers' environmental identity (Gkargkavouzi et al., 2018; Kızılay & Önal, 2019; Önal et al., 2020; Öztarakçı, 2019; Pektaş & Şentürk, 2020; Rathore et al., 2020; Saraç & Sarikaya, 2020) and environmental attitude (Arik & Yilmaz, 2017; Artvinli et al., 2019; Aznar-Díaz et al., 2019; Balcı et al., 2011; Efe & Baran, 2017; Erbasan & Erkol, 2020; Erol & Gezer, 2006; Esa, 2010; Filippou et al., 2017; Kaşot & Batman, 2018; Lahiri, 2011; Larijani & Yeshodhara, 2008; Nazarenko & Kolesnik, 2018; Özden, 2008; Qasim, 2016; Rao & Suribabu, 2018; Şama, 2003; Saraç & Kan, 2015; Shobeiri et al., 2006; Tanık Önal & Büyük, 2018) were conducted mostly on teacher candidates rather than experienced teachers. These studies in the published literature demonstrates that teacher candidates' and teachers' environmental identity and environmental attitude related to different variables, but ignored the concept that has not been studied so far, that is sustainable leadership.

Although there is a great concern about sustainable leadership based on educational organizations in the literature (Agsonsua et al., 2019; Chaudhry et al., 2020; Cherkowski, 2010; Clarke & Stevens, 2009; Conway, 2015; Cook, 2014; Goolamally & Ahmad, 2014; Hardie, 2015; Hargreaves & Fink, 2003, 2012; Nartgun et al., 2020; Nieto, 2007; Paweenwat et al., 2019; Williams, 2013; Yaakob et al., 2020; Yollu, 2017), this concern has not yet been

seen in the context of environmental approaches. Furthermore, there is no study in the published literature that examines teachers' environmental identity and environmental attitude via the mediating role of sustainable leadership.

### **1.3. Purpose of the Research**

This study aims to investigate the mediating role of sustainable leadership on the relationship between teachers' environmental identity and environmental attitude. Through this study, it is believed that the current gap in the published literature based on this subject will be removed.

### **1.4. Importance of the Research**

Environmental education helps people to get ecological information, and it enables them to develop their attitudes towards the environment and turn these attitudes into environmentally friendly behaviors (Saraç & Sarikaya, 2020, p. 957). The effectiveness of environmental education is based on availability and performance of teachers who are trained about the environment (Rao & Suribabu, 2018, p. 2). In relation to this, Thompson Jr and Gasteiger (1985) put forward the view that effective environmental education and issues should be taken into consideration since they see university students as leaders of the future. On the other hand, the reduction and prevention of environmental problems are mostly based on future generations' environmental awareness (Phenice & Griffore, 2003). These generations should learn natural world and show their positive perspectives, attitudes and actions about the environment in early school times (Wilson, 1996). Taking into consideration these views, it is clear that teachers have an essential role to provide their students needed knowledge, skills, attitudes and values in order to help students to become environmentally conscious individuals. If teachers have strong environmental awareness and enough environmental knowledge, they can inspire their students about this subject and achieve to grow them as environmentally friendly people. Thus, the teachers should have a positive attitude, needed skills and competencies in relation to environmental concerns (Rao & Suribabu, 2018).

In other words, teachers have privilege to educate individuals that will become parents, professionals, doctors, lawyers, laborers, leaders and even teachers of the future's world (Lahiri, 2011, p. 39). Even though initiatives of teachers are not mostly recognized in the world, teachers are one of the hopes for creating environmentally conscious societies. Hence, this study put forward its importance in this context.

### **1.5. Problem of the Research**

Is there a mediating role of sustainable leadership on the relationship between teachers' environmental identity and environmental attitude?

#### **1.5.1. Sub-Problems of the Research**

Do environmental identity, environmental attitude and sustainable leadership levels of teachers show significant differences in terms of;

- Gender,
- Age,
- Marital status,
- Education level,
- Position,
- Job experience,
- Teaching level,
- Branch,
- Settlement,
- Whether or not they are interested in environment,
- Whether or not they are sensitive to environmental issues,
- Whether or not they are aware of environmental problems,
- Types of environmental problems,
- Whether or not they receive environmental education,
- The frequency of attending seminars, meetings or congresses about environmental problems,
- Whether or not they are member of any environmental NGOs,
- Their source of environmental knowledge,
- The frequency of discussing environmental issues or problems with students or colleagues,
- Whether or not they organize extracurricular activities,
- Whether or not they involve in environmental research, study or project process,
- Whether or not they raise awareness about environmental issues,
- Whether or not they receive education on sustainable leadership ?

### **1.6. Assumptions**

The research is based on the following assumptions:

- ❖ Data collection tools are convenient for the purpose of the research.
- ❖ The research group has given correct and sincere answers to the survey questions.
- ❖ It is thought that the sample represents the population.
- ❖ Statistical methods used in data analysis are convenient for this research.

### **1.7. Limitations**

This research is limited with;

- 449 teachers from different branches of the profession in Adana, Turkey,
- The data obtained from the Environmental Identity Scale, Environmental Attitude Scale and Sustainable Leadership Scale,
- The data obtained from demographic questions,
- The data obtained from general statements about the environment.

## **2. LITERATURE REVIEW**

### **2.1. Environmental Identity**

#### **2.1.1. Describing Identity**

In order to understand meaning and structure of environmental identity, it is important to see how the concept of identity is perceived in general. Generally, identity is a distinctive characteristic which is linked with an individual or a group (Freed & Wong, 2019, p. 4).

According to Clayton and Opatow (2003, p. 45), identity is a construct which gives information about the self. People try to get to know themselves and define their identity with their learning ability. Here, identity is a core construct that defines, describes and locates an individual within a psychological, social and political context and is increasingly recognized related to environmental issues (Clayton, 2012, p. 1). Identity can be created not only in the way that people determine their own labels but also labels imposed by others. In other words, an identity can be seen as an individual's fingerprint in that it distinguishes one person from another in terms of unique characteristics and creates personal thoughts, feelings, attitudes and behavior patterns.

Although individuals have unique identity themselves, their identity is shaped by genetics, culture, tradition, religion, value, opinion, job etc. According to Clayton (2012), while the concept of identity more used in psychological research to give information about race, gender, morality, social groups and development; it is less used in research areas such as economics, organizations, leadership and foreign policy, and did not much take into consideration studies related with philosophy, sociology and political theory. People have different sort of identities varying with reference to their positions and experiences in their life. These identities can come up with sources that include history, emotional connection, similarity that affect people's perception and act to the world (Sparks et al., 2021). In a similar manner, identities are influenced by social relationships and experiences (Tugurian & Carrier, 2017). According to Clayton and Opatow (2003), identities determine social roles and these social roles create responsibilities for individuals in terms of their positions.

### **2.1.2. The Nature of Environmental Identity**

Environmental identity is one of the identities that has been defined in a wide range of contexts in the literature. It refers to aspect of an individual's identity that covers his or her relationship with nature, and shows the ways in that people orient themselves and are oriented towards the natural world (Clayton & Opatow, 2003, p. 2; Young et al., 2020, p. 3050). Shortly, environmental identity is a self-concept in relation to the environment (Li et al., 2016, p. 300). From another perspective, environmental identity is a measure of individuals' interdependence with nature and it emerges through their direct and personal experiences with the natural world. Another definition of environmental identity meets the meaning that an environmentally friendly person who is described by environmentalism in the cultural environment (Kashima et al., 2014, p. 64). Also, as Whitmarsh and O'Neill (2010, p. 7) put that environmental identity is a label which differentiates environmentalists from non-environmentalists based on their beliefs, values and norms about the natural world. According to Schultz and Tabanico (2007, p. 1221) environmental identity is essentially the belief for people that the natural environment where they live is an important part of who they are. The structure of environmental identity shows both individual and social characteristics. These characteristics of environmental identity can be in accord or incompatible with other forms of identity. Therefore, environmental identity is also interpreted as an understanding of individual's self through interactions with the natural world in accordance with social experiences (Weigert, 2008). In spite of the fact that environmental identity (Clayton & Opatow, 2003) is also conceptualized as environment identity (Stets & Biga, 2003) and ecological identity (Thomashow, 1996), all these concepts have three common themes (Rathore et al., 2020, p. 15). Firstly, environmental identity is one's self perception related to the environment; secondly, it is both an individual and collective identity that individual's interests match up with environmental interests; and thirdly, an individual's environmental identity is formed through social interactions (Rathore et al., 2020, p. 15).

According to Nisbet et al. (2009), environmental identity shows individual's relationship and loyalty with the environment. Thus, it is possible for people to reduce and prevent environmental problems through sharing a common environmental identity. In order to gather people around a common environmental identity, the number of studies which affect feelings, perspectives and opinions of individuals on environmental issues need to be increased (Pektaş & Şentürk, 2020, p. 182). The increase in the number of people who recognize and adopt

environmental identity can help the environmental identity gain more sense for its functionality. When the published literature is reviewed in relation to teachers and their environmental identity, it can be seen that there are various studies regarding mostly teacher candidates rather than experienced teachers.

According to Pektaş and Şentürk (2020) who studied the environmental identity of teachers in terms of different factors such as gender, branch, living area; statistically significant difference was confirmed between prospective teachers' environmental identities with respect to their branches, however, no significant difference was found between their perceptions of environmental identity in terms of gender. These researchers also showed that prospective teachers who participated environmental activities and/or courses related environment and whose families and themselves reside in rural areas have higher environmental identity than others who did not participate environmental activities and/or courses related environment and whose families and themselves reside in urban areas. According to Gkargkavouzi et al. (2018) who conducted a study on Greek teachers' connectedness to nature and their environmental identity levels, teachers had high levels of environmental identity and greater connectedness to nature as a result of their environmental knowledge and environmentally friendly behaviors. Environmental identity can change depending on the situations how people relate themselves to nature (Saraç & Sarıkaya, 2020, p. 952). In their study, Saraç and Sarıkaya (2020) observed that environmental education based on moral reasoning can be used to improve the environmental identity of teacher candidates and to reduce materialistic tendencies towards the environment. They thought that it may have resulted from having the opportunity to make moral judgements about how their consumption preferences and behaviors affect the environment and to evaluate different environmental problems from different perspectives.

There is a strong relationship between people's attitudes and behaviors towards the environment and their environmental identity (Clayton, 2012; Öztarakçı, 2019; Pektaş & Şentürk, 2020). Environmental identity can be determined in the ways of both how people see themselves (internally) and how people are seen by others (externally) (Clayton, 2012; Clayton & Opatow, 2003; Stets & Biga, 2003). According to Tugurian and Carrier (2017) who investigated the relationship between children's environmental identity and the natural world on elementary school science classroom, both the teacher and children faced with

difficulties to recognize others' environmental identity. Tugurian and Carrier (2017) also concluded that the reason of this inability was attributed to the lack of relationship between shared experiences and the natural world. When more opportunities are provided for teachers and children to interact and experience in the natural environment, they will have good relationship on this context.

### **2.1.3. Components, Aspects and Development of Environmental Identity**

Environmental identity is examined under three components: affective, cognitive and experiential (Clayton, 2003; Nisbet et al., 2009). Associated with the affective component, Hinds and Sparks (2008, p. 110) put that environmental identity is strongly in relation to an affective connection with the natural environment. According to Pooley and O'Connor (2000, p. 712), in order to predict individuals' environmental attitudes, affect can be an important factor in shaping their attitudes related to the environmental issues. It was also expected that affective connection helps to estimation of intentions about behaviors experiencing with the environment (Hinds & Sparks, 2008). Following this, the experience of the natural environment can demonstrate a positive affect for individuals to tend to present environmentally friendly behaviors (Hinds & Sparks, 2009, p. 182). Related to cognitive component, Clayton (2003, p. 131) pointed that emphasizing consistency in cognitive structures lead to create a perception of unity for the development of environmental identity and transformations of these cognitive structures help individuals to create their sense for changing environmental identity over time. Importantly, it was also seen that cognitive structure of information about environmental issues gave individuals who have high levels of environmental identity (EID) a direction to make their decisions on environmental dilemmas and helped them to make more confident decisions related to the natural environment (Olivos & Clayton, 2017, p. 111). In respect of experiential component, it can be said that environmental education which develops individuals' environmental identity and their activities towards the environment gain more sense through experiential forms of learning (Clayton, 2003).

In her study, Stapleton (2015, p. 97) applied five key aspects of identity to environmental identity. These key aspects can be expressed through descriptive sentences as following:

1. Environmental identity has a feature of malleability over time,
2. Environmental identity is closely connected to practice,

3. Environmental identity is generally informed and/or recreated with social interactions,
4. Environmental identity exists on multiple levels,
5. Environmental identity is influenced by education.

Even though these aspects listed separately, they are all tightly related and intertwined with each other. Malleability of environmental identity implies that environmental identity is not static, it is changing. It means that the person who possesses environmental identity may not have this possession indefinitely or who has not previously expressed this identity may have it at any time. Following this, the creation and continuity of environmental identity is provided only through connection to sustainable practices (Kempton & Holland, 2003). These practices are facilitated by social interactions and these social interactions with different types of people formed environmental identity through their social characteristics such as race, class and ethnicity. All these relations emerge on different geographic areas, groups and cultures as a result of education related to environment in this framework (Stapleton, 2015).

The development of environmental identity is provided based on some changes. Kempton and Holland (2003, p. 331) indicated that this development can be achieved through three changes: salience, identification and practical knowledge. The salience shows that an individual becomes more environmentally conscious and participates to environmental action. The identification involves seeing oneself as an actor in the environmental threat which results to care about the consequences and take responsibility of one's actions related to environment. The practical knowledge occurs through action. With this knowledge, an individual understands who and what is engaged in environmental activity, has an idea about what can need to be fulfilled and helps others as a mentor along the way.

In their study, Simms and Shanahan (2019) examined the four types of reflection (inquiry, emotional, critical and critical-self) as strategies that support development of environmental identity in the context of classroom. According to Rogers (2001, p. 41), reflection is a process or activity which is both cognitive and affective that (1) requires individuals' active engagement; (2) is mobilized by an experience or situation; (3) involves observing responses, actions and beliefs regarding the situation at hand; and (4) results in new understanding related to the experience. Here, as Simms and Shanahan (2019) indicated that Dewey's (1910) view of inquiry reflection refers to active consideration of any belief or knowledge in the light of reasons and results to which it leans. Boud et al. (1985) explained that emotional reflection

is individual's engagement in intellectual and affective activities of exploring their experiences that provides new understanding. Critical reflection refers to identification of assumptions about thoughts and actions, assessment of these assumptions to control their validation, and transformation of these assumptions to actions (Mezirow, 1995). When the critical reflection focuses on one's own thoughts, values and actions; it is called as critical-self reflection and except this, all reflection types develop environmental identity (Simms & Shanahan, 2019).

#### **2.1.4. Impressions of Environmental Identity**

Kashima et al. (2014, p. 64) showed that environmental identity estimated a broad range of environmentally friendly behaviors better than generally accepted measure of environmental world which is New Ecological Paradigm (Dunlap et al., 2000). However, they also argued that the relationship between individuals' environmental identity and environmentally friendly behaviors should be examined in order to ensure about their consistency with each other. For instance, if an individual who sees himself or herself as an environmentally friendly individual but does not tend to perform useful behaviors related to protection of the environment such as waste reduction, energy conservation, eco-shopping to be consistent with his or her environmental identity, there is no way to say that his or her environmental identity could motivate his or her environmentally friendly behavior. Regarding this point, Stets and Biga (2003, p. 406) indicated that environmental identity has both direct and indirect (through environmental attitudes) effect on environmentally friendly behaviors. These researchers also added that the stronger environmental identity yields the more favorable environmental attitudes in relation to the environment. Accordingly, it has been found that there is a good correlation between environmental identity and environmental friendly practices such as using energy efficiently (Clayton, 2003) and recycling (Mannetti et al., 2004).

On the other hand, Blatt (2013) emphasized that there are motivation factors to strengthen environmental identity. Following her examination of change of behavior in an environmental science classroom, she determined these motivation factors as cultural backgrounds, social interactions and classroom structures. Including these motivation factors in her study, she found that these factors encourage individuals' useful behaviors in relation to the environment. When it is looked at the research conducted by Önal et al. (2020) who examined the relationship between prospective science teachers' environmental identity and

environmentally friendly behaviors, it was found that prospective science teachers have high environmental identity through environmental identity's factor of "being part of nature." The authors also concluded that a positive and moderate correlation between environmental identity and environmentally friendly behaviors was based on the important influence of environmental identity in shaping environmentally friendly behaviors. Kızılay and Önal (2019) who studied the relationship between environmental identity and behaviors related to the environment on pre-service science teachers according to their gender variables and grade levels, found that there is a moderate relationship between these teachers' environmental identity and their behaviors related to the environment. In this result, while women had higher environmental identity than men according to gender variable, there was no statistically significant difference found between teachers' environmental identity in terms of their grade levels. With reference to Rathore et al. (2020) who explored the role of environmental identity on early childhood education (ECE) teachers as migrants between India and New Zealand, teachers' environmental identity which was influenced by different cultures could be equally important. Additionally, Clayton and Kılınç (2013) and Sparks et al. (2021) proved that environmental identity scale is one of the most strongest measures that predict pro-environmental behaviors. As Li et al. (2016) stated that environmental identity is a good variable that influences individuals' attitudes and behaviors toward the development of the natural environment. Their study developed and tested a model based on Chinese residents' satisfaction with the government through the moderating role of environmental identity on the relationship between residents' perceived benefits and satisfaction. They found that environmental identity had an important role in residents' satisfaction with the government and showed a significant mediating role through different effects of perceived benefits on satisfaction.

In the published literature, there is a consensus on the decision that environmental identity has a higher correlation with and is a better predictive factor of environmental behavior in comparison to environmental attitude (Blatt, 2013; Clayton, 2003; Kempton & Holland, 2003; Stapleton, 2015; Stets & Biga, 2003). According to Freed and Wong (2019), university students' decision making process plays a mediating role between their environmental identity and environmentally friendly behaviors. However, these researchers also indicated that environmental identity was highly correlated to environmentally friendly behaviors, and regardless of their levels of environmental identity university students presented recycling

activities as an environmentally friendly behaviors. To scrutinize better understanding of environmental attitudes and how environmental identity may be developed, Clayton et al. (2011) thought that potential impact of having experiences with animals made zoos important places for this goal. At the end of their study, they concluded that zoos had a substantial position that enabled the development of environmental identity encouraging conservation of animals and predicting environmental attitudes better within the context of environmental concern.

## **2.2. Environmental Attitude**

### **2.2.1. Understanding Attitude**

There is a need to explain the term attitude in order to understand environmental attitude. Efe and Baran (2017, p. 36) indicated that the attitude parallels with the complexity of human emotions and difficult to be changed over time. When a person determines the attitude towards an object, he or she can predict the behavior and preferences regarding the object in question (Saraç & Kan, 2015). Today's current education system requires environmental education that not only depends on curriculum activities and other facilities related to environment provided to students but also teachers' quality about awareness, attitude, knowledge and skills in this context (Larijani & Yeshodhara, 2008, p. 195). Therefore, it is important for this system to have qualified and environmentally conscious teachers to serve as a role model in advancing attitude towards environment for students. In general meaning, attitude is defined through its three components: cognitive, affective and conative (Rao & Suribabu, 2018; Singh & Gupta, 2013). The cognitive component is an individual's knowledge and view of a place, including facts about it. The affective component refers to emotional aspects of an individual's attitudes related to the place. The conative component matches up with behavioral intentions of individual in relation to the place.

### **2.2.2. Exploring Environmental Attitude**

Attitude when formed related to environmental object is named as environmental attitude (Kaiser et al., 1999, 2007). In the traditional view, an environmental attitude is seen as one's object that is either the natural environment itself or behavior towards conservation (Kaiser et al., 2007, p. 243). Within a broader sense, it is such a collection which includes beliefs, affect and behavior intentions of individual who possesses them regarding environment (Milfont &

Duckitt, 2004). According to Erten (2005, p. 91), environmental attitude is all the positive and negative attitudes and thoughts of people caused by environmental problems such as fear, anger, anxiety, value judgements and readiness to solve environmental problems towards environmentally friendly behaviors. Individuals' experiences of nature and environmental education are effective in forming their attitude towards the environment (Tanık Önal & Büyük, 2018). The earliest literature shows similar studies based on environmental attitude in terms of university students. Based upon environmental attitude survey results on students of Cornell University in 1971 and 1981 by Thompson Jr and Gasteiger (1985), significant differences were seen by both surveys in terms of geographical background, gender, political leanings and income. These differences showed more materialistic lifestyle whereas less consideration for environmental issues and concerns. In a similar way, 1990 study was conducted by Gigliotti (1992) including additional measures of environmental attitude. The author remarked that 1990s' students less tended to make personal sacrifices than 1970s' students. He added that to provide effectivity of environmental education, the connections between period's lifestyles and environmental issues should be understood before making personal sacrifices in relation to environmental problems.

On the other hand, the near past and current studies focused mostly on teacher candidates whereas less on teachers in the subject of environmental attitude. According to Larijani & Yeshodhara (2008) who studied environmental attitude of Indian and Iranian primary school teachers in terms of gender and country variables, it was seen that Iranian teachers had more positive environmental attitude than Indian teachers in terms of country. They attributed this difference to countries' religion, culture and values. In terms of gender variable, significant differences were found in both countries for different factors of environmental attitude. Similar to Larijani and Yeshodhara (2008), Shobeiri et al. (2006) studied on secondary school teachers' environmental attitude in different public and private schools of India and Iran. There were also significant differences found between environmental attitudes of teachers in the countenance of India. While gender was a factor which had an effect on environmental attitude of teachers, type of school (public or private) was not a factor that had no effect on teachers' attitude towards the environment. To Arik and Yilmaz (2017) who focused on attitudes of prospective science teachers towards environmental problems at Gaziosmanpaşa University in Tokat using both quantitative and qualitative methods, teachers were acquainted with environmental problems but had intermediate level of environmental attitude. While

attitudes towards the environment showed significant differences according to gender, no significant difference was found between their attitudes in relation to factors such as age, type of high school, type of residence, parents' education level, occupation and economic status, and membership status of any environmental organization. These authors remarked that prospective science teachers have knowledge about environmental pollution but they can not perform their knowledge very well. Related with this view, they also suggested that environmental education courses at the university should be constructivist and active learning based, students should get information actively through practices and they should interact with the environment individually. According to study conducted by Tanık Önal and Büyük (2018) who examined environmental attitudes and environmentally friendly behaviors of science teacher candidates studying in the first, second, third and fourth grades of the Faculty of Education at Erciyes University in terms of gender, grade and residence, the findings showed that teacher candidates had medium level of environmental attitude. Besides, the statistically significant differences were found among environmental attitudes of teacher candidates based upon gender and grade, yet no difference was confirmed in terms of residence. Similar study was conducted by Şama (2003) who examined environmental attitudes according to the factors which are gender, grade level and department, settlement, geographical region, education level and job of father, and parents' income level. The results of this study showed that significant differences were observed between student teachers' environmental attitude and their gender, settlement, father's education level and job. These differences were seen in favour of female, big settlement, fathers who have a higher education level and better statute than others. Nonetheless, there was no difference found according to grade level and geographical region.

Curiously, Qasim (2016)'s study focused on primary school teachers and concluded that the teachers' environmental attitude shows significant differences in favour of urban teachers of Allahabad in India. However, there was no significant difference seen in terms of private and government schools. Also, the obtained results showed that except for grade level, department and geographical region; significant differences were found between attitudes of teacher candidates in terms of all factors of environmental attitude scale. In her study, Lahiri (2011) who examined the relationship between pupil (prospective) teachers' environmental attitude (EAT) and responsible environmental behavior (REB), saw that the pupil teachers who have teaching experiences showed higher environmental attitude than whom have not any teaching

experience and low correlation between their EAT and REB was confirmed. Additionally, the statistically significant differences were found between these teachers related to their courses of study which means teachers who studied Science had higher environmental attitude than who studied course of Humanities or Commerce. With reference to Efe and Baran (2017), it can be said that pre-service science teachers' levels of environmental attitude will affect students' assessments towards environment positively. Following results of their study, they concluded that improving instructional materials from waste materials had positive effect on pre-service science teachers' environmental attitude, and gender played an important role in this result. Another study that was conducted by Rao and Suribabu (2018) who found significant differences among prospective secondary school teachers' environmental attitude in terms of its dimensions such as health, hygiene and polluters. Artvinli et al. (2019) studied environmental attitude level of primary school teacher candidates and indicated this level as moderate because of inability of teacher candidates to put theoretical environmental education into practice on an intended level. They also presented that teacher candidates' living area where they live for a long time and mother-father education level have no significant role on their environmental attitude, however, gender and grade level have significant role on this manner. Aznar-Díaz et al. (2019) analyzed environmental attitudes of future primary education teachers at the University of Granada corresponding pollution, recycling, natural spaces and biodiversity. It was found that these trainee teachers demonstrate high level of environmental attitudes in relation to current environmental issues, and put that environmental education has key role to respond current environmental issues by new generations in the future. Furthermore, no statistically significant difference was confirmed for environmental attitudes in terms of gender.

Özden (2008) conducted an empirical research about environmental awareness and attitudes of Turkish student teachers on the basis of factors such as gender, number of siblings, grade level, academic major, socioeconomic status (income level of family, parents' education and job level, residence) and geographical region. He summarized his conclusion as the women elementary student teachers in the fourth grade of their program who have less than three siblings with high level of socioeconomic status (have parents that are rich, well educated and working on good status, living in urban area) living in the region of Marmara showed more positive environmental attitudes than other student teachers. Within the context of Malaysian education system, Esa (2010) asserted that there were inadequate studies on student teachers'

environmental knowledge, attitude and behaviors. She saw the lack of study which examines this subject based on Malaysian biology pre-service teachers and studied this subject regarding education for sustainable development. According to her results of the study, it was carried out that there is a strong correlation between environmental knowledge and attitude, and this relationship affects behaviors towards the environment positively. In contrast to this study, the study of Pe'er et al. (2007) which examined the same subject on student teachers in Israel, found that there is a weak correlation between knowledge and behavior and between attitude and behavior. The authors attributed this result to the impact of media exposure on environmental issues on the quality of life in Israeli society. In the related literature based on different individuals rather than teachers, Kaiser et al. (2007) found that individuals' environmental attitude can be derived from self-reported behaviors which are conservative and these behaviors bring them an ability to realize their attitudes in relation to environment. Regarding environmental attitudes of residents, Arcury (1990) demonstrated a direct relationship between Kentucky residents' environmental knowledge and environmental attitude. However, the interesting point of his study is that control of demographic factors (age, gender, education, residence and income) showed a weak association between environmental knowledge and environmental attitude linked to low level of knowledge about the environment.

### **2.2.3. Characteristics, Dimensions and Evaluation of Environmental Attitude**

According to Schultz (2001), environmental attitude is classified as egoistic (oneself), biospheric (the biosphere) and altruistic (other people) concern. Here, each concern determines a beneficiary of a protectionist or a victim of a damaged lifestyle. This perspective reduces conflict between individual's self-interest and other people (Kaiser et al., 2007). Precisely, each individual's consumption of resources compulsorily diminishes them at the expense of the biosphere or other people. As indicated by Kaiser et al. (1999, p. 4), environmental attitude consists of three components regarding environment: environmental knowledge, environmental values and ecological behavior intention. Among these components, environmental knowledge is a prerequisite for individual's attitude towards the environment and this knowledge should not have a strong relation with ecological behavior because its effect is reduced through environmental attitude and ecological behavior intention (Kaiser et al., 1999). Individual's environmental values affect his or her intention related to ecological behavior (McGuinness et al., 1977; Midden & Ritsema, 1983). Nevertheless, this

effect changes from low level (Midden & Ritsema, 1983) to high level (McGuinness et al., 1977). Specifically, ecological behavior intention is the strongest one that has a mediator effect between environmental knowledge and environmental values to present ecological behaviors towards the environment (Kaiser et al., 1999).

According to Singh and Gupta (2013) who examined the components of environmental attitude on Indian consumers, it was suggested that environmental attitude components were predictor of ecological behavior, and improving environmental attitude was seen as one of the important steps in achieving sustainable environment. To achieve sustainable environment, Larijani and Yeshodhara (2008) set strategies for education system that can change teachers' environmental attitude in a favorable way. These strategies can be summarized as follows:

- Encouraging teachers to help development of environmental issues,
- Supporting teachers to participate in seminars and conferences related to discussion of environmental problems,
- Providing courses and programs about environmental education to teachers and
- Including studies related to environment in curriculum that covers all levels of education. In addition to this, Shobeiri et al. (2006) recommended that governments should provide and enhance environmental education programs in schools that empower teachers' environmental attitudes.

#### **2.2.4. Role and Importance of Environmental Attitude**

In order to encourage individuals to adopt environmentally friendly behaviors towards environmental problems, it is necessary and important to determine their environmental attitudes. Since individuals' attitudes towards the environment begin to take shape from a very young age with the effect of messages given by one of the role models as teachers, the feelings and thoughts they reflect, and the environmentally friendly behaviors they display; teachers' attitudes towards the environment has the potential to affect students':

- Concerning of environmental problems,
- Sensitivity to environmental issues in lessons and life,
- Positions they will take during the discussions of environmental subjects,
- Learning materials they will use and develop,
- Ability to show positive attitude towards the environment,

Adoption of environmentally friendly behaviors, and  
Environmental awareness (Tanık Önal & Büyük, 2018, pp. 1283–1284).

Based on Gifford et al. (1982)'s work, it is clear that environmental attitudes are seriously related with individual difference measures. According to results of this work, university students' environmental attitudes showed differences related to attitude components (affect, verbal commitment, actual commitment and knowledge) in this way:

Female students;

- are more upset than male students about environmental problems (affect),
- say that they will do things about it (verbal commitment),
- report that they are not doing more about it (actual commitment), and
- know less about it in fact (knowledge).

While factors such as offering environmental education to students or not, students' academic orientation (natural science, social science and non-science) and gender have impacts on the relationship between students' attitude and environment; factors such as their age and year in school have no impact on this relationship (Gifford et al., 1982). Thus, it is important to note that better understanding of environmental attitude in relation to individual differences will generate better potential for designing and implementing studies, programs, courses and projects related with environmental education that perform well. Moreover, teachers can educate their students about environment only if the teachers themselves have environmental attitude on necessary level (Shobeiri et al., 2006, p. 356). According to Kim and Fortner (2006) environmental attitude is an important factor affecting teachers' tendency towards environmental issues. Şama (2003) indicates that the success of environmental education depends on answering the questions of how do attitudes towards environment occur and how can people change their negative attitudes towards the environment. He also supports that environmental problems can be solved through changing of understanding and attitudes with positive perspectives.

## **2.3. Sustainable Leadership**

### **2.3.1. The Concept of Leadership**

Leadership is a concept which has been widely researched and subject to different academic studies since the middle of the 20th century (Goolamally & Ahmad, 2014). It is also a

phenomenon which is complex and socially constructed (Forbes, 2014, p. 152). Although there is no universal definition of leadership in the literature, all definitions of leadership mostly involve achieving organizational objectives through the process of leader's influence on followers, subordinates and organizations; leader's characteristics and a leader himself/herself as changemaker (Goolamally & Ahmad, 2014, p. 122). According to Vries (2006), the root of the word "leadership" comes from the word of "lead" which means 'road' or 'path' as a noun, and 'to travel' as a verb form. Therefore, a leader is the person who shows his or her followers the way by walking ahead. As Cheshire, CEO of Kingfisher, put that leadership is related to get people to go where they can not go on their own (Polly, 2010). It shows the right direction that people will follow to achieve their goals. According to Cherkowski (2010, p. 24), leadership creates the environment in which learning communities adapt diversity as a way of life. In the subject of school excellence, principals and teachers are the leaders who play a unique role in shaping and sustaining school culture including diversity (Cherkowski, 2010; Goolamally & Ahmad, 2014). Teachers can help students to connect their lives with others. Thus, teachers can strengthen students to be aware of their own power and support them to take steps in the direction of changing the world in a positive way. Specifically, Hargreaves and Fink (2012) stated that long term changes and continuity are achieved by three key forces which are leadership, leadership success and sustainable leadership.

### **2.3.2. Sustainable Leadership, Principles and Factors**

The concept of sustainability is important, and it is associated with different fields in terms of social, ethics, financial, politics etc. (Šimanskienė & Župerkienė, 2014). It differs from maintainability and can be defined as the ability to continuously create developments against new complexities and challenges by building capacity and capability to achieve successful results (Davies, 2007). As Fullan (2005) and Hargreaves and Fink (2012) stated that sustainability does not only involve constructing a good system in an organization, but also covers effective initiatives for the development of present and future cases. Sustainable development is emphasized as a responsibility for leaders (Šimanskienė & Župerkienė, 2014). The concept of sustainable leadership has arisen since using the terms sustainability and leadership together (Nartgun et al., 2020, p. 142). It was developed during 1980s, based on sustainability literature in the field of environment, as alarms were increased about human impacts on the world (Cherkowski, 2010, p. 26). Sustainable leadership is related with not

only leader's role on profit maximization but also his or her ability to manage human resources in relation to the environment, society and long-term development objectives (Mukherjee, 2020, p. 8). It can be defined as the ability of transferring resources to the future by protecting and improving values (Yollu, 2017, p. 14).

In environmental context, sustainable leadership can be explained with the following descriptions made by Hargreaves and Fink (2003, p. 3):

Sustainable leadership;

- is one of the shared responsibilities that does not destroy natural or financial resources and prevents negative effects on environment based on community and education,
- spreads and lasts therefore matters,
- has an effective interaction with the forces that penetrate it,
- creates an educational environment that has organizational diversity,
- encourages feed of different ideas and successful activities in the shared learning and development of environments.

In relation to these descriptions, in their books which is called "Sustainable Leadership", Hargreaves and Fink (2012) outline the seven principles for sustainable leadership under main concepts based on educational change. These concepts are depth, length, breadth, justice, diversity, resourcefulness and conservation that can be explained as the following (Hargreaves & Fink, 2012):

1. Depth: It refers to the principle that "Sustainable leadership matters." In this sense, developing something which is sustaining itself helps creating and preserving sustaining learning. According to Stoll et al. (2002), educational leaders have a major responsibility that is to sustain learning. Sustaining learning improves intellectual, social and emotional skills on students that matters and lasts (Hargreaves & Fink, 2003). Therefore, in order to adapt this principle of sustainable leadership to teachers who are seen as sustainable leaders in schools, it can be said that what sustains natural life should be inspired on students through teachers.

2. Length: It refers to the principle that "Sustainable leadership lasts." Most valuable aspects of life are preserved and advanced from one leader to the next, over time, through sustainable leadership (Hargreaves & Fink, 2003, 2012). Sustainable developments are not temporary and do not disappear when their creators have left or died. These developments are transferred year upon year through sustainable leaders.

3. Breadth: It refers to the principle that “Sustainable leadership spreads.” In a complex and dynamic world, there is no leader who can or should control everything without help (Fullan, 2001). Since sustainable leadership is not only the responsibility of individuals, it has necessity to be distributed and shared by others (Hargreaves & Fink, 2003). Therefore, distributing leadership throughout the community in which leadership is shared and developed by others helps extension of leadership. For school leaders, it is possible to say that the leadership succession sustains from one leader to another regarding educational change and environmental awareness.

4. Justice: It refers to the principle that “Sustainable leadership contributes rather than gives a harm to the environment.” It conscientiously use its resources to provide development of all talents instead of a few individuals who have been already determined. Hence, it has a characteristic which is socially fair, not self-centered for leaders (Hargreaves & Fink, 2012).

5. Diversity: It refers to the principle that “Sustainable leadership provides environmental diversity.” It is against standardization (Hargreaves & Fink, 2003). The advances in learning, teaching and leading provide the networks for the process of development in these different types of advances (Giles & Hargreaves, 2006). In schools, principals and teachers can enable students to adapt improvement in the environment through diverse practices towards the environment.

6. Resourcefulness: It refers to the principle that “Sustainable leadership improves resources and does not destroy them.” It elicits time, opportunity and energy for leaders to learn and network from, as well as, coach and guide each other.

7. Conservation: It refers to the principle that “Sustainable leadership learns from the advances of the past and transforms itself for the better future.” The system of sustainable leadership knows caring of their leaders and getting leaders who knows care of themselves. Sustainable leadership honors about conserving and restoring its long-standing objectives (Hargreaves & Fink, 2012).

Sustainable leadership creates success and strengthens human values (Fullan, 2005). According to Davies (2007), sustainable leadership has nine key factors which support long-

terms success and development in schools. These factors can create an understanding of development of sustainable leadership in schools as the following list:

1. High-level of outputs can be achieved through deep learning and the associated outcomes.
2. There should be a balance between short term and long term objectives to achieve success.
3. Leaders use opportunities to argue not only the problems of the present but also the challenges of the future.
4. Passion has the potential to move vision into action by emotional side of leadership.
5. Personal humility and professional grand creates ambition only for institution.
6. In order to adapt the new activity, ‘knowing when’, ‘knowing what to do’ and ‘knowing what to give up or abandon’ is important.
7. Conversations that move from day-to-day matters on to the discussions of the environment are called strategic conversations and can be developed by sustainable leaders.
8. Beginning with the last in mind helps sustainable leaders to create a range of strategic measures for success.
9. Building sustainability creates achievement that lasts.

### **2.3.3. Studies on Sustainable Leadership**

In the published literature based on sustainable leadership, various academic studies exist related to different perspectives. Cherkowski (2010) studied leadership in the educational field regarding diversity and sustainability based on sustainable leadership. Her study indicated that teachers should question and reflect their own beliefs and values that form the substantial culture in their schools, and express their opinions about how they can promote equal and quality learning for all students that builds sustainable development in the school culture. According to Williams (2013) whose study is called “Unleashing Sustainable Leadership In Schools”, school problems can be solved by teachers with the use of leadership practices on sustainability. This study also demonstrated that principles of sustainable leadership in school settings are comply with the learning goals of these schools, and may provide leadership development as well as teaching staff sustainability. Nartgun et al. (2020) carried out a study on the relationship between sustainable leadership and perceived school effectiveness. The findings of this study about teachers’ perceptions showed that sustainable leadership predicts perceived school effectiveness, and there is a significant correlation between sustainable leadership and perceived school effectiveness at high level. Yaakob et al.

(2020) worked on critical success factors for sustainable leadership. Their work asserts that all success factors of sustainable leadership named as concentrate on pupils, maintain positive work environment, building lateral capacity, deep learning, intelligent accountability and commitment to changing context were achieved at high levels in the schools of Malaysia. Segovia-Pérez et al. (2019) investigated the importance of education in developing sustainable leadership and fostering self-perception of capabilities on female students at university level. These authors indicated that through education programs based on leadership, female students can build their leadership skills, capabilities, strengths and tools and also advance their self confidence. They also put forward that education is one of the important factors which helps to provide sustainable development and gender equity in managerial positions. Chaudhry et al. (2020) discussed the influences of sustainable leadership styles on students' success based on previous studies. They highlighted that universities can be the best institutional heroes in the case of sustaining learning. The authors also added that universities will affect countries' economic growth positively through solving challenges and bringing individuals into potential leaders with the presented knowledge and the sustainable strategies. Agonsua et al. (2019) examined the ideas about sustainable leadership of private school principals in Thailand. According to the findings of this study, it was seen that the level of sustainable leadership of private principals is high. The authors concluded that the private schools have to invest in their institution and develop themselves in order to be sustainable, secure, survival, and drawn attention by students and parents.

#### **2.3.4. Teachers as Sustainable Leaders in Schools**

According to Bajunid (2006), sustainable leadership refers to moral and purpose-driven leadership, which concentrates on understanding the issues in relation to school and education. Creating sustainable change which focuses on environmental developments that increase students' learning skills and knowledge can be realized by sustainable leadership (Davies, 2007; Williams, 2013). Goolamally and Ahmad (2014, p. 131) indicated that school leaders such as principals and teachers should have five important characteristics to achieve excellence of school and create sustainable leadership. These characteristics are: integrity, forward-looking, inspirational, competency and self-efficacy. Here, integrity refers to consistency between leader's words, thoughts, feelings and actions. In other words, leader with the characteristic of integrity are respectful, honest, loyal and trustful to themselves and other people. Forward-looking helps leader providing growth of the organization through

instilling followers in the way of work spirit, motivation and a shared vision. Inspirational leader has advanced soft skills and encourage each organization member to work for the shared vision and objective of the organization. The competency characteristic has dimensions such as work, emotional and spiritual. While work competency refers to the skill that leader has and use this skill to apply leadership strategies and techniques effectively, emotional competency provides the leader control of himself or herself through monitoring feelings and emotions. The leader with spiritual competency has the ability to integrate his or her inner life feelings with working life feelings. On the other hand, self-efficacy is the inner ability which helps the leader to do things for the achievement of goals. In short, the sustainable leader orients the human resources and encourage actions towards a better world and its sustainability (Mukherjee, 2020).

In the environmental context, as sustainable leaders, teachers can convey their knowledge about environmental developments to the students who are seen as sustainable leader candidates for the future generations. In order to support this view, the guidelines that can develop sustainable leadership of school leaders interpreted by Agonsua et al. (2019, pp. 2–3) and presented as follows:

- Sustainable school leaders should share their experience, develop goals and provide network,
- Sustainable school leaders should observe the situation for advancing the programs and for new changes,
- Sustainable school leaders should use their skills and competencies in communication, and they (specially private school leaders) should provide appropriate supplementary budgets,
- Sustainable school leaders should generate and put into practice a coaching system in schools until they become a part of the school culture,
- Sustainable school leaders should be cooperative to enhance academic success, and
- Sustainable school leaders should be encouraged to have self-development, and cooperation with organizations and institutions outside the school as learning sources for the teaching staffs.

### 3. MATERIALS AND METHODS

The research was carried out with a survey technique applied on a selected sample. The applied survey form was presented in the Appendix.

#### 3.1. Research Model and Hypotheses

This study aims to determine teachers' environmental identity levels and environmental attitude levels based on teachers' perceptions, sustainable leadership level of teachers and to put forward the relationships among those variables. It also analyses the mediating role of sustainable leadership on the relationship between teachers' environmental identity and environmental attitude.

A mediation model was determined and formed based on Baron and Kenny (1986). According to Baron and Kenny (1986), if a variable that is claimed to be a mediator variable satisfies four conditions one after another, it is defined as a mediator variable. The four conditions that are necessary for the mediation model can be expressed as the following:

1. The independent variable should significantly affect the dependent variable.
2. The independent variable should significantly affect the mediator variable.
3. The mediator variable should significantly affect the dependent variable.
4. When the independent variable, mediator variable and the dependent variable are analysed at the same time; the mediator variable should significantly affect the dependent variable. In this case, if there is an insignificant relationship ( $p > 0.05$ ) between the independent variable and the dependent variable the full mediation effect occurs, and if the relationship between the independent variable and the dependent variable decreases ( $p < 0.05$ ) a partial mediation effect occurs (Gürbüz, 2019, p. 52; Yıldız, 2020, p. 123).

The mediation model of this study is illustrated in Figure 3.1 below. In this model, Environmental Identity (EID) is taken as the independent variable, Environmental Attitude (EAT) is taken as the dependent variable, and Sustainable Leadership (SLE) is taken as the mediator variable. As it can be seen from the research model, there are three variables in the study. The variables are considered as one-dimensional. How the variables used in the study are encoded in the data set are shown in parentheses below the variable names.

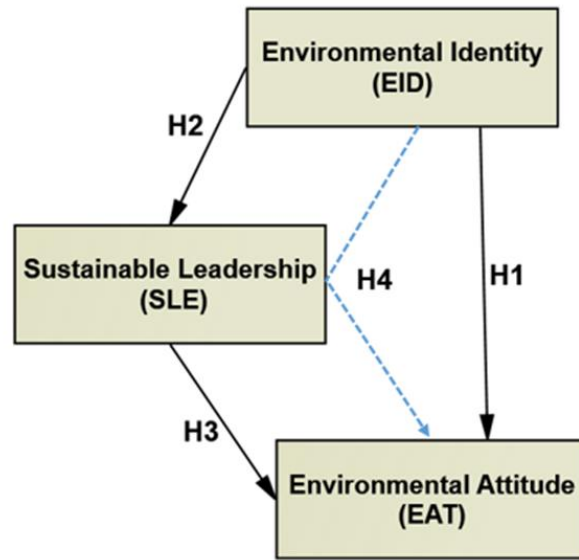


**Figure 3.1.** Research model

The hypotheses developed within the research model are as follows:

H1: EID has a positive effect on EAT.

H2: EID has a positive effect on SLE.

H3: SLE has a positive effect on EAT.

H4: SLE has a mediating role on the relationship between EID and EAT.

### 3.2. Population and Sample

The population of the research has been determined as the teachers working in pre-school, primary school, secondary school and high schools in Adana, which are affiliated with the Ministry of National Education. Since it is not possible to reach all teachers, a sample of teachers working in the selected schools was studied. Therefore, 50 schools from different education levels (pre-school, primary school, secondary school and high school) were selected using convenience sampling method. Then, online survey forms were sent to the principals of these schools, and they were asked to share the survey forms with the teachers working in these schools. 600 online survey forms were sent to those school principals using random sampling method. The collection process has been tried to kept under control as much as possible. As a result of this process, 453 survey forms were returned. Later, during data entry, it was seen that 4 survey forms were not filled in appropriately and were excluded from the analysis. As a result of all these procedures, the analyzes were made on the sample of 449

people. According to Yazıcıoğlu and Erdogan (2004, pp. 49–50) who determined the size of population that can be represented with a reliability of 0.95 and a sampling error of 0.05, it is indicated that a sample of 394 individuals can represent a population of more than one million people (Meydan, 2010, p. 132). Hence, it is decided that the research sample size which is 449 people is sufficient.

### **3.3. Data Collection Tools**

In this study, a structured online survey was used as a data collection. This survey consists of demographic information questions, general information statements about the environment, “The Environmental Identity Scale”, “The Environmental Attitude Scale” and “The Sustainable Leadership Scale.”

#### **3.3.1. The Environmental Identity Scale**

The Environmental Identity Scale used in the study was developed by Clayton (2003), adapted to Turkish by Clayton and Kılınç (2013) who converted this scale to 7-point Likert scale ranging from (1) never true to (7) always true. The scale includes 24 items, has been used in different studies before, and its reliability and validity have been tested. It does not have a reverse-coded item. The Cronbach’s Alpha reliability coefficient of the scale was found as 0.90 by Clayton (2003), 0.91 by Öztarakçı (2019) and Wesolek (2020). According to Clayton (2003), The Environmental Identity Scale includes five dimensions which are ‘salience of identity’, ‘self-identification’, ‘ideology associated with the group’, ‘positive emotions’ and ‘autobiographical information.’ However, Tanık (2012) who made both Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA), determined four dimensions which are ‘environmental identity’, ‘desire to be close to nature’, ‘resemblance to nature’ and ‘environmentally friendly behaviors.’

#### **3.3.2. The Environmental Attitude Scale**

The Environmental Attitude Scale was developed by Berberoglu and Tosunoglu (1995) to measure environmental attitudes of university students. The scale consists of 21 items. It is a 5-point Likert scale ranging from (1) strongly disagree to (5) strongly agree and it has reverse-coded items. The Cronbach’s Alpha reliability coefficient of this scale was reported as 0.77 by Berberoglu and Tosunoglu (1995), 0.82 by Genç and Genç (2013). In the scale evaluation, while positive items were calculated as (5) strongly agree, (4) agree, (3) neither agree nor

disagree, (2) disagree, (1) strongly disagree; negative items were coded reverse and evaluated as (5) strongly disagree, (4) disagree, (3) neither agree nor disagree, (2) agree, (1) strongly agree (Berberoglu & Tosunoglu, 1995; Genç & Genç, 2013).

### **3.3.3. The Sustainable Leadership Scale**

The Sustainable Leadership Scale was used in the study to determine the sustainable leadership levels of teachers. This scale was developed by Mukherjee (2020) and has 10 items. It is a 5-point Likert scale ranging from strongly agree (5) to strongly disagree (1). The scale does not have any reverse-coded item. The Cronbach's Alpha reliability coefficient was found as 0.70 by Mukherjee (2020) which is well within the recommended level (Nunally, 1978).

### **3.4. Data Analysis Method**

The data obtained from the survey forms were analyzed using SPSS 24.0 and SmartPLS 3.3.3 programs. Before the analysis of the data, the data was checked to indicate whether or not there were missing values and no missing values were determined. Frequency analysis and descriptive statistics were used to determine the characteristics of the data obtained from surveys. In order to test whether or not the items on variables of environmental identity, environmental attitude and sustainable leadership show a normal distribution, the skewness and kurtosis coefficients, and Coefficients of Variance (CV) were examined. Following this, Cronbach's Alpha test was conducted to evaluate the reliability of the scales. Then, the suitability of the scales for factor analysis was investigated with the Kaser-Meyer-Olkin (KMO) measure of sampling adequacy and the Barlett's Test of Sphericity. The SmartPLS 3.3.3 program was used for factor analysis, Partial Least Squares Structural Equation Modeling (PLS-SEM) path analysis and mediation effect analysis of the research model. SPSS 24.0 program was used for t-test analysis and One Way ANOVA analysis in order to make comparisons between groups. In order to examine homogeneity of variances, Levene's Test was used in t-test and One Way ANOVA. Post Hoc Tests (Dunnett and Tamhane's T2) were used in the One Way ANOVA to determine the group differences. Dunnett was used to compare each group with the control group and to see differences clearly in group comparisons when equal variances assumed. Tamhane's T2 was used to compare each group in terms of making careful comparisons when equal variances not assumed. 95% Confidence Interval (CI) was taken into account in the analyzes.

### 3.5. Analysis of the Data

#### 3.5.1. Normality Analysis

The normality of the scales was evaluated according to skewness and kurtosis coefficients, and CV. Since the skewness and kurtosis coefficients of the variable that are between -2 and +2 (George & Mallery, 2010), and CV of the variable, which is found by dividing standart deviation over mean, is below 30% (Çakır, 2019), the distribution of the data is accepted as having a normal distribution. Table 1 shows the normal distribution analysis results of the environmental identity scale. As it can be seen in Table 3.1, skewness (-1.243) and kurtosis (1.941) values range between -2 and +2. Also, it is seen that the CV value is 10.485% which is below 30%. As a result of these values, it can be said that the distribution of the EID scale had a normal distribution.

**Table 3.1.** Normal distribution analysis results of the EID scale

| Variable                     | Mean  | Median | Std. Deviation | Skewness | Kurtosis | CV (%) | CI  |
|------------------------------|-------|--------|----------------|----------|----------|--------|-----|
| Environmental Identity (EID) | 6.161 | 6.292  | 0.646          | -1.243   | 1.941    | 10.485 | 95% |

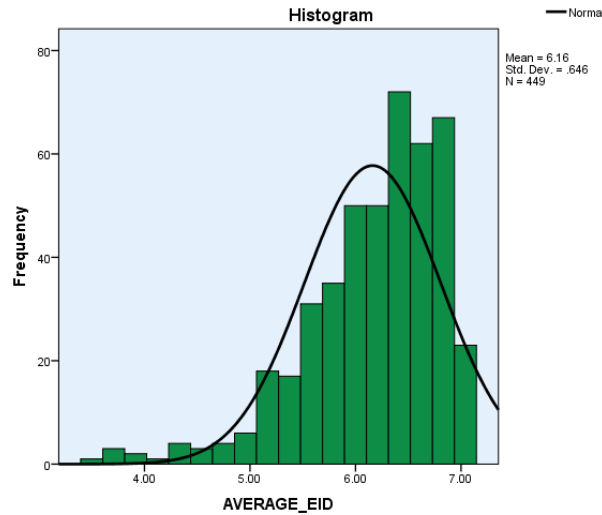


**Figure 3.2.** Normal distribution graph of the EID scale

The histogram graph of normal distribution of the environmental identity scale is given in Figure 3.2. According to Figure 3.2, it can be seen that the distribution of the environmental identity scale is insignificantly left-skewed and steep. This distribution feature is considered to be in accordance with a normal distribution (George & Mallery, 2016).

Normal distribution analysis results of the environmental attitude scale are presented in Table 3.2 below. As it can be seen in Table 3.2, skewness (0.224) and kurtosis (1.346) values range between -2 and +2. Also, it is seen that the CV value is 11.253 which is below 30%. Therefore, it can be stated that the distribution of the EAT scale had a normal distribution.

**Table 3.2.** Normal distribution analysis results of the EAT scale

| Variable                     | Mean  | Median | Std. Deviation | Skewness | Kurtosis | CV (%) | CI  |
|------------------------------|-------|--------|----------------|----------|----------|--------|-----|
| Environmental Attitude (EAT) | 3.057 | 3.048  | 0.344          | 0.224    | 1.346    | 11.253 | 95% |

The histogram graph of normal distribution of the environmental attitude scale is presented in Figure 3.3 below.

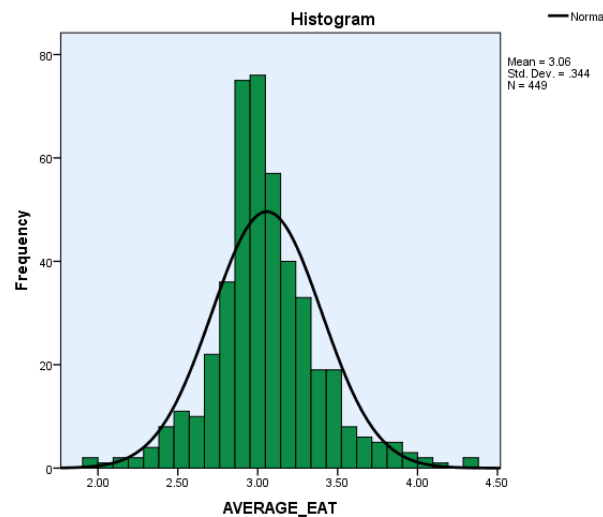


**Figure 3.3.** Normal distribution graph of the EAT scale

According to Figure 3.3, it can be seen that the distribution of environmental attitude scale is insignificantly right-skewed and steep. This situation is compatible with a normal distribution. Normal distribution analysis results of the sustainable leadership scale are given in Table 3.3. According to Table 3.3, skewness (-0.532) and kurtosis (-0.640) values range between -2 and +2. The CV value is 16.425 which is below 30%. Thus, it can be asserted that the distribution of the SLE scale had a normal distribution.

**Table 3.3.** Normal distribution analysis results of the SLE scale

| Variable                     | Mean  | Median | Std. Deviation | Skewness | Kurtosis | CV (%) | CI  |
|------------------------------|-------|--------|----------------|----------|----------|--------|-----|
| Sustainable Leadership (SLE) | 4.146 | 4.200  | 0.681          | -0.532   | -0.640   | 16.425 | 95% |

The histogram graph of normal distribution of the sustainable leadership scale is shown in Figure 3.4.

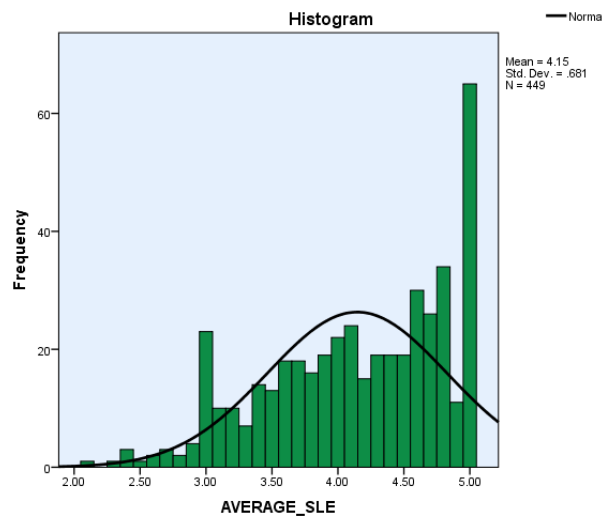


**Figure 3.4.** Normal distribution graph of the SLE scale

According to Figure 3.4, it is seen that the distribution of the sustainable leadership scale is insignificantly left-skewed and flat. This distribution characteristic is favorable for normal distribution conditions.

According to all these normality results of the variables, the parametric tests were used in the analysis of the group comparisons for all variables. These tests are Independent Samples t Test and One Way ANOVA.

### 3.5.2. Reliability and Validity Analysis

In order to evaluate the reliability of the scales, Cronbach's Alpha test was conducted. According to Hulin et al. (2001), a Cronbach's Alpha coefficient from 0.60 to 0.70 indicates an acceptable level, and 0.80 or greater indicates a very good level for reliability. The Cronbach's Alpha coefficients of the variables were presented in Table 3.4. According to Table 3.4, it can be seen that EID ( $\alpha=0.910$ ) and SLE ( $\alpha=0.903$ ) have high reliability, and EAT ( $\alpha=0.722$ ) indicates an acceptable level for reliability. While the EAT scale had 21 items, 10 items were excluded from the scale because they reduced the reliability of the scale. The excluded items are EAT3, EAT4, EAT6, EAT11, EAT12, EAT13, EAT14, EAT17, EAT20 and EAT21. These items were one dimension of environmental attitude scale which is called as "the necessity of understanding environmental problems." Therefore, only one dimension of environmental attitude scale which is called as the "environmental attitude" was

used in the research. This dimension includes 11 items that are EAT1, EAT2, EAT5, EAT7, EAT8, EAT9, EAT10, EAT15, EAT16, EAT18 and EAT19.

**Table 3.4.** SPSS results of reliability of the scales

| Scale | N of Items | Cronbach's Alpha |
|-------|------------|------------------|
| EID   | 24         | 0.910            |
| EAT   | 11         | 0.722            |
| SLE   | 10         | 0.903            |

The validity of the scales for factor analysis was investigated with the KMO measure of sampling adequacy and the Barlett's Test of Sphericity. While the KMO measure of sampling adequacy must be in excess of 0.50 (Hair et al., 2006; Tabachnick & Fidell, 2007), the significant level for Barlett's Test of Sphericity (p value) is stated to be less than 0.05 (Hair et al., 2006). The validity values of the scales were given in Table 3.5.

**Table 3.5.** SPSS results of validity of the scales for factor analysis

| Scale | N of Items | KMO   | Barlett's Test of Sphericity |     |       |
|-------|------------|-------|------------------------------|-----|-------|
|       |            |       | Approx. Chi-Square           | df  | Sig.  |
| EID   | 24         | 0.942 | 4676.281                     | 276 | 0.000 |
| EAT   | 11         | 0.837 | 874.660                      | 55  | 0.000 |
| SLE   | 10         | 0.933 | 2945.607                     | 45  | 0.000 |

According to Table 3.5, the KMO measure of sampling adequacy for EID (0.942), EAT (0.837), SLE (0.933) was greater than 0.50 and their Barlett's Test of Sphericity values (p values) were less than 0.05. Thus, it can be said that all these scales are valid for factor analysis of the data.

### 3.5.3. Measurement Model

In an attempt to test the structural validity of the scales, factor analysis was applied on measurement model. Using PLS-SEM, factor analysis of the obtained data was applied in the SmartPLS 3.3.3 program.

#### 3.5.3.1. Factor Analysis

The inner model of the measurement model was given in Figure 3.5. Based on this model, EID (24 indicators), EAT (11 indicators) and SLE (10 indicators) were tested to determine the

reliability and validity of the measurement model. When results of the test was examined, it was seen that the internal consistency reliability and convergent validity criteria of the measurement model were not provided due to low factor (outer) loadings belong to the scales. While the internal consistency reliability criterion is provided only when Cronbach's Alpha, Composite Reliability (CR) and rho\_A coefficients  $\geq 0.70$  (Hair et al., 2017; Jörg Henseler et al., 2016), the convergent validity criterion is provided when outer loadings  $\geq 0.708$  (Hair et al., 2006) and Average Variance Extracted (AVE)  $\geq 0.50$  (Chin, 1998). If AVE coefficients provide the threshold value, the outer loadings more than 0.40 can be accepted (Hair et al., 2006). In order to provide these criteria, indicators whose outer loadings range between 0.40 and 0.70 were excluded from the measurement model one by one and the analysis was repeated after elimination of each indicator until the threshold values are reached (Yıldız, 2020).

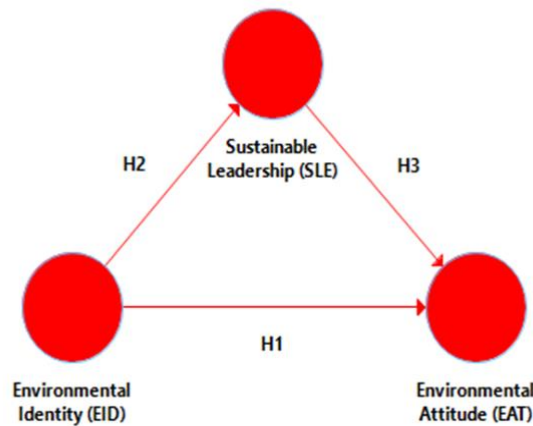


**Figure 3.5.** SmartPLS-SEM-Inner model

The indicators whose outer loadings range between 0.40 and 0.70 were extracted from the measurement model. The extracted indicators of the scales are the following:

Environmental Identity Scale Indicators: EID1, EID6, EID8, EID9, EID12, EID16, EID17, EID20, EID21, EID23, EID24.

Environmental Attitude Scale Indicators: EAT1, EAT2, EAT5, EAT9, EAT10, EAT19.

Sustainable Leadership Scale Indicators: SLE9, SLE10.

Out of four dimensions of environmental identity scale that has 24 items in total, only one dimension which is called as the “environmental identity” was used in the research. This dimension includes 13 items that are EID2, EID3, EID4, EID5, EID7, EID10, EID11, EID13,

EID14, EID15, EID18, EID19 and EID22. From environmental attitude scale that has 11 items, six items were excluded from the analysis because of not showing factor loads. Hence, five items of environmental attitude scale which are EAT7, EAT8, EAT15, EAT16 and EAT18 were used in the research. Because sustainable leadership scale consisted of only one dimension, all items of the sustainable leadership scale were used in the research except for SLE9 and SLE10.

The last form of the measurement model obtained after outer loadings are removed is shown in Figure 3.6. This figure is the outer model of the data based on measurement model.

All analyzes in Smart PLS 3.3.3 and SPSS 24.0 were carried out over the measurement model in Figure 3.6 and the factors of this model.

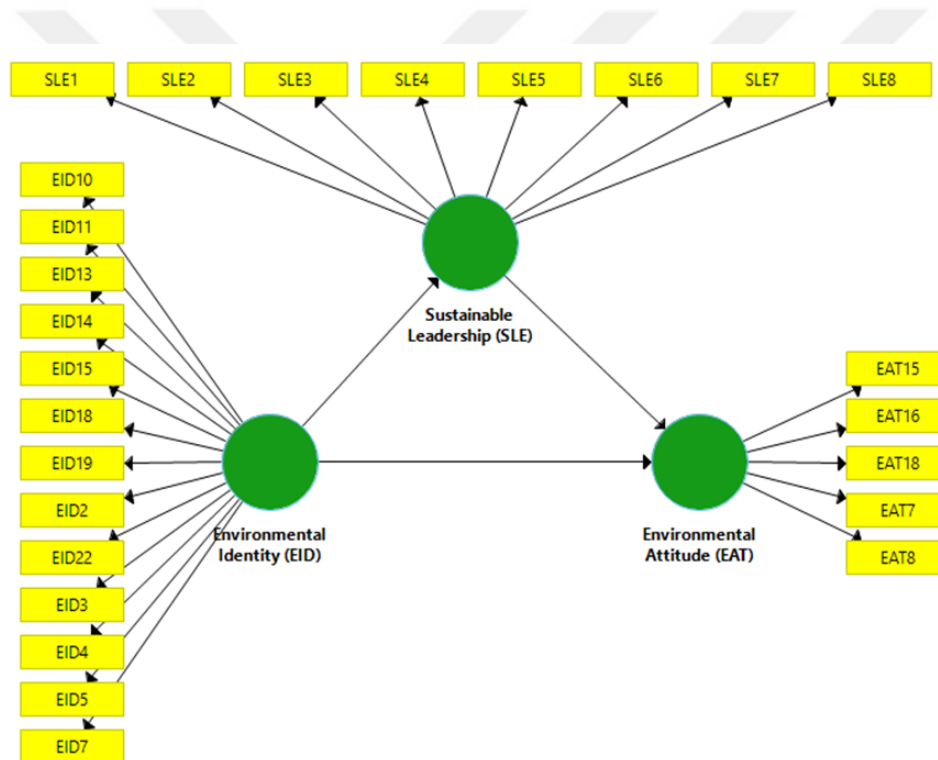


**Figure 3.6.** SmartPLS-SEM-Outer model

As it can be seen in Figure 3.6; the EID scale consists of 13 items, the EAT scale consists of 5 items and the SLE scale consists of 8 items for the research model as presented in Figure 3.1.

### 3.5.3.2. Internal Consistency Reliability and Convergent Validity Analysis

While the criterion suggested by Hair et al. (2017) and Henseler et al. (2016) was used in determining the internal consistency reliability, the criterion suggested by Chin (1998) and Hair et al. (2006) was used in determining the convergent validity of the measurement model. The internal consistency and convergent validity values were obtained by factor analysis and are shown in Table 3.6. According to Table 3.6, the internal consistency reliability was provided due to the Cronbach's Alpha, CR and rho\_A coefficients are more than 0.70.

Although there are factor loadings which are less than 0.708 in Table 3.6, these factor loadings are acceptable since the AVE coefficients provided the threshold value (Hair et al., 2006). Therefore, it can be said that the convergent validity was provided.

**Table 3.6.** Measurement model factor analysis results

| Variable                     | Item  | Factor Loading | Cronbach's Alpha | rho_A | CR   | AVE  |
|------------------------------|-------|----------------|------------------|-------|------|------|
| Environmental Identity (EID) | EID2  | 0.603          | 0.91             | 0.91  | 0.92 | 0.50 |
|                              | EID3  | 0.688          |                  |       |      |      |
|                              | EID4  | 0.702          |                  |       |      |      |
|                              | EID5  | 0.680          |                  |       |      |      |
|                              | EID7  | 0.708          |                  |       |      |      |
|                              | EID10 | 0.606          |                  |       |      |      |
|                              | EID11 | 0.756          |                  |       |      |      |
|                              | EID13 | 0.782          |                  |       |      |      |
|                              | EID14 | 0.726          |                  |       |      |      |
|                              | EID15 | 0.795          |                  |       |      |      |
|                              | EID18 | 0.629          |                  |       |      |      |
|                              | EID19 | 0.613          |                  |       |      |      |
| Sustainable Leadership (SLE) | EID22 | 0.671          |                  |       |      |      |
|                              | SLE1  | 0.710          | 0.94             | 0.94  | 0.95 | 0.70 |
|                              | SLE2  | 0.836          |                  |       |      |      |
|                              | SLE3  | 0.855          |                  |       |      |      |
|                              | SLE4  | 0.870          |                  |       |      |      |
|                              | SLE5  | 0.890          |                  |       |      |      |
|                              | SLE6  | 0.857          |                  |       |      |      |
|                              | SLE7  | 0.800          |                  |       |      |      |
|                              | SLE8  | 0.837          |                  |       |      |      |
| Environmental Attitude (EAT) | EAT7  | 0.747          | 0.72             | 0.72  | 0.81 | 0.50 |
|                              | EAT8  | 0.684          |                  |       |      |      |
|                              | EAT15 | 0.598          |                  |       |      |      |
|                              | EAT16 | 0.722          |                  |       |      |      |
|                              | EAT18 | 0.658          |                  |       |      |      |

### 3.5.3.3. Discriminant Validity Analysis

In the determination of discriminant validity, “Cross Loadings” condition and the “Fornell-Larcker Criterion” proposed by Fornell and Larcker (1981) and the “Heterotrait-Monotrait

Ratio (HTMT) HTMT coefficients suggested by Henseler et al. (2015) were used. The Cross Loadings of the measurement model are shown in Table 3.7. As seen in Table 3.7, each indicator of the scales had the highest value of factor load under its own variable, and it was determined that the difference between the factor load in its own variable and the factor load in other variables is not less than 0.1. Therefore, it can be indicated that the condition of Cross Loadings is fulfilled.

**Table 3.7.** Cross Loadings of the measurement model

| Item  | Environmental Attitude (EAT) | Environmental Identity (EID) | Sustainable Leadership (SLE) |
|-------|------------------------------|------------------------------|------------------------------|
| EAT15 | <b>0.598</b>                 | 0.168                        | 0.131                        |
| EAT16 | <b>0.722</b>                 | 0.168                        | 0.155                        |
| EAT18 | <b>0.658</b>                 | 0.185                        | 0.171                        |
| EAT7  | <b>0.747</b>                 | 0.256                        | 0.135                        |
| EAT8  | <b>0.684</b>                 | 0.226                        | 0.184                        |
| EID10 | 0.133                        | <b>0.606</b>                 | 0.201                        |
| EID11 | 0.163                        | <b>0.756</b>                 | 0.304                        |
| EID13 | 0.218                        | <b>0.782</b>                 | 0.272                        |
| EID14 | 0.230                        | <b>0.726</b>                 | 0.240                        |
| EID15 | 0.228                        | <b>0.795</b>                 | 0.370                        |
| EID18 | 0.158                        | <b>0.629</b>                 | 0.259                        |
| EID19 | 0.159                        | <b>0.613</b>                 | 0.176                        |
| EID2  | 0.231                        | <b>0.603</b>                 | 0.270                        |
| EID22 | 0.211                        | <b>0.671</b>                 | 0.360                        |
| EID3  | 0.163                        | <b>0.688</b>                 | 0.285                        |
| EID4  | 0.248                        | <b>0.702</b>                 | 0.257                        |
| EID5  | 0.243                        | <b>0.680</b>                 | 0.215                        |
| EID7  | 0.251                        | <b>0.708</b>                 | 0.320                        |
| SLE1  | 0.082                        | 0.301                        | <b>0.710</b>                 |
| SLE2  | 0.166                        | 0.322                        | <b>0.836</b>                 |
| SLE3  | 0.187                        | 0.323                        | <b>0.855</b>                 |
| SLE4  | 0.219                        | 0.336                        | <b>0.870</b>                 |
| SLE5  | 0.257                        | 0.371                        | <b>0.890</b>                 |
| SLE6  | 0.197                        | 0.331                        | <b>0.857</b>                 |
| SLE7  | 0.155                        | 0.320                        | <b>0.800</b>                 |
| SLE8  | 0.221                        | 0.372                        | <b>0.837</b>                 |

The results of the analysis made according to the Fornell-Larcker Criterion are presented in Table 3.8. The values in bold in Table 3.8 are the square root values of AVE. When the values in the table are examined, it is seen that the AVE square root value of each structure is higher than the correlation coefficients with other structures. This is the criterion proposed by Fornell-Lacker and it is seen that this criterion is provided on the measurement model.

**Table 3.8.** Fornell-Larcker Criterion results

|                              | Environmental Attitude (EAT) | Environmental Identity (EID) | Sustainable Leadership (SLE) |
|------------------------------|------------------------------|------------------------------|------------------------------|
| Environmental Attitude (EAT) | <b>0.684</b>                 |                              |                              |
| Environmental Identity (EID) | 0.298                        | <b>0.692</b>                 |                              |
| Sustainable Leadership (SLE) | 0.228                        | 0.403                        | <b>0.834</b>                 |

The results of the analysis made according to the HTMT coefficients are given in Table 3.9. When the coefficients are examined, it is seen that the HTMT coefficients do not exceed 0.85 and 0.90 values. Since the SmartPLS 3.3.3 program paints the values other than these values with green (Henseler et al., 2015), it is seen that the threshold value is provided for the HTMT criterion.

**Table 3.9.** HTMT coefficients

|                              | Environmental Attitude (EAT) | Environmental Identity (EID) | Sustainable Leadership (SLE) |
|------------------------------|------------------------------|------------------------------|------------------------------|
| Environmental Attitude (EAT) |                              |                              |                              |
| Environmental Identity (EID) | 0.359                        |                              |                              |
| Sustainable Leadership (SLE) | 0.272                        | 0.426                        |                              |

Providing the desired threshold values for Cross Loadings, Fornell-Larcker and HTMT criteria is a proof that the discriminant validity condition is fulfilled (Yıldız, 2020, p. 71). In other words, all results of Table 3.7, Table 3.8 and Table 3.9 showed that the discriminant validity of the measurement model is provided.

#### 3.5.3.4. Correlation and Fit Indexes

Correlations between variables, and fit summary values are presented in Table 3.10. According to this table, it is seen that all variables are correlated. In Table 3.10, fit summary values are presented as Root Mean Square Theta (RMSttheta), Standardized Root Mean Square Residual (SRMR), Chi-Square and Normed Fit Index (NFI).

**Table 3.10.** Variables correlation and Fit index

|                                                                | Correlations                 |                              |                              |
|----------------------------------------------------------------|------------------------------|------------------------------|------------------------------|
|                                                                | Environmental Attitude (EAT) | Environmental Identity (EID) | Sustainable Leadership (SLE) |
| Environmental Attitude (EAT)                                   | 1                            |                              |                              |
| Environmental Identity (EID)                                   | 0.298                        | 1                            |                              |
| Sustainable Leadership (SLE)                                   | 0.228                        | 0.403                        | 1                            |
| RMSttheta: 0.109; SRMR: 0.056; Chi-Square: 889.792; NFI: 0.857 |                              |                              |                              |

For the RMStheta, values below 0.12 are determined as good fit values (Henseler et al., 2015). If the SRMR value is less than 0.08, it can be stated as a good fit (Hu & Bentler, 1999). When NFI value is more than 0.90, the model is accepted as well-matched model (Çakır & Adıgüzel, 2020). Nonetheless, this value was found as 0.86 in the study. Following these values, it can be said that all Fit indexes were determined as good fit for the model except for NFI value.

### 3.5.4. Structural Model

VIF coefficients for linearity are calculated by analyzing the relationship of the model whose reliability and validity analysis has been completed. Before hypothesis testing, it should be proven that there is no linearity between variables (Yıldız, 2020). The research model, which was used as a measurement model until this stage, is used as a structural model after this stage.

#### 3.5.4.1. Linearity Analysis

High correlation between variables is called as linearity (Hair et al., 2006). The existence of linearity may cause the standard errors to grow, the factor loadings or correlation coefficients to be miscalculated, and the signs to change (Hair et al., 2017). Two values are used to test the linearity (Yıldız, 2020). These are the Variance Inflation Factor (VIF) and Tolerance. According to Hair et al. (2017),  $VIF \geq 5$  or  $Tolerance \leq 0.20$  indicates a linearity problem. The VIF coefficients were examined in the analysis. If the VIF coefficients are less than 5, it is decided that there is no linearity problem. The VIF coefficients are presented in Table 3.11, and it is seen that the VIF coefficients of the model are less than 5. Therefore, it was determined that the model was found to have no linearity problem in the study.

**Table 3.11.** Structural model coefficients

| Variables                    |                              | VIF   | R <sup>2</sup> | f <sup>2</sup> | Q <sup>2</sup> |
|------------------------------|------------------------------|-------|----------------|----------------|----------------|
| Environmental Identity (EID) | Environmental Attitude (EAT) | 1.193 | 0.103          | 0.057          | 0.044          |
| Sustainable Leadership (SLE) |                              | 1.193 |                | 0.015          |                |
| Environmental Identity (EID) | Sustainable Leadership (SLE) | 1.000 | 0.162          | 0.193          | 0.110          |

R<sup>2</sup> (rate of explanation) is a coefficient that indicates what percentage of endogenous variables were explained by exogenous variables (Yıldız, 2020). When the R<sup>2</sup> values of the model examined, it was found that the environmental attitude was explained by 10% and the sustainable leadership was explained by 16%. In table 3.11, f<sup>2</sup> and Q<sup>2</sup> coefficients were also

given. While  $f^2$  coefficient indicates effect size,  $Q^2$  coefficient shows prediction relevance of the model. According to Table 3.11, it can be said that the sustainable leadership had medium effect size ( $f^2=0.19>0.15$ ), and both the environmental attitude ( $Q^2=0.04>0$ ) and the sustainable leadership ( $Q^2=0.11>0$ ) had prediction relevance (Hair et al., 2017). In order to understand whether the model is ready for hypothesis tests, it was checked whether or not the factor loadings are statistically significant. The p values of the factor loadings are presented with dark color in Table 3.12.

**Table 3.12.** Statistical results of the indicators

| Indicators                            | Original Sample (O) | Sample Mean (M) | Standard Deviation (STDEV) | T Statistics (O/STDEV) | P Values     |
|---------------------------------------|---------------------|-----------------|----------------------------|------------------------|--------------|
| EAT15 <- Environmental Attitude (EAT) | 0.598               | 0.590           | 0.065                      | 9.144                  | <b>0.000</b> |
| EAT16 <- Environmental Attitude (EAT) | 0.722               | 0.718           | 0.055                      | 13.124                 | <b>0.000</b> |
| EAT18 <- Environmental Attitude (EAT) | 0.658               | 0.652           | 0.057                      | 11.623                 | <b>0.000</b> |
| EAT7 <- Environmental Attitude (EAT)  | 0.747               | 0.743           | 0.049                      | 15.387                 | <b>0.000</b> |
| EAT8 <- Environmental Attitude (EAT)  | 0.684               | 0.686           | 0.060                      | 11.414                 | <b>0.000</b> |
| EID10 <- Environmental Identity (EID) | 0.606               | 0.602           | 0.050                      | 12.077                 | <b>0.000</b> |
| EID11 <- Environmental Identity (EID) | 0.756               | 0.756           | 0.033                      | 22.796                 | <b>0.000</b> |
| EID13 <- Environmental Identity (EID) | 0.782               | 0.781           | 0.030                      | 26.087                 | <b>0.000</b> |
| EID14 <- Environmental Identity (EID) | 0.726               | 0.721           | 0.041                      | 17.609                 | <b>0.000</b> |
| EID15 <- Environmental Identity (EID) | 0.795               | 0.795           | 0.023                      | 34.486                 | <b>0.000</b> |
| EID18 <- Environmental Identity (EID) | 0.629               | 0.625           | 0.033                      | 18.816                 | <b>0.000</b> |
| EID19 <- Environmental Identity (EID) | 0.613               | 0.615           | 0.053                      | 11.470                 | <b>0.000</b> |
| EID2 <- Environmental Identity (EID)  | 0.603               | 0.604           | 0.045                      | 13.376                 | <b>0.000</b> |
| EID22 <- Environmental Identity (EID) | 0.671               | 0.675           | 0.034                      | 19.947                 | <b>0.000</b> |
| EID3 <- Environmental Identity (EID)  | 0.688               | 0.689           | 0.039                      | 17.447                 | <b>0.000</b> |
| EID4 <- Environmental Identity (EID)  | 0.702               | 0.701           | 0.032                      | 21.914                 | <b>0.000</b> |
| EID5 <- Environmental Identity (EID)  | 0.680               | 0.678           | 0.040                      | 17.125                 | <b>0.000</b> |
| EID7 <- Environmental Identity (EID)  | 0.708               | 0.708           | 0.027                      | 26.133                 | <b>0.000</b> |
| SLE1 <- Sustainable Leadership (SLE)  | 0.710               | 0.709           | 0.033                      | 21.586                 | <b>0.000</b> |
| SLE2 <- Sustainable Leadership (SLE)  | 0.836               | 0.835           | 0.019                      | 42.974                 | <b>0.000</b> |
| SLE3 <- Sustainable Leadership (SLE)  | 0.855               | 0.854           | 0.019                      | 45.193                 | <b>0.000</b> |
| SLE4 <- Sustainable Leadership (SLE)  | 0.870               | 0.870           | 0.018                      | 48.375                 | <b>0.000</b> |
| SLE5 <- Sustainable Leadership (SLE)  | 0.890               | 0.891           | 0.013                      | 68.412                 | <b>0.000</b> |
| SLE6 <- Sustainable Leadership (SLE)  | 0.857               | 0.857           | 0.023                      | 36.899                 | <b>0.000</b> |
| SLE7 <- Sustainable Leadership (SLE)  | 0.800               | 0.800           | 0.028                      | 28.333                 | <b>0.000</b> |
| SLE8 <- Sustainable Leadership (SLE)  | 0.837               | 0.838           | 0.024                      | 34.785                 | <b>0.000</b> |

According to the p values of the factor loadings in Table 3.12, it can be seen that all factor loadings are statistically significant ( $p \leq 0.05$ ) for 95% CI.

## 4. RESULTS AND DISCUSSION

### 4.1. Frequency Analysis and Descriptive Statistics Results

The demographic information for the sample in this study is shown in Table 4.1. As seen in table 4.1, out of 449 participants 184 (41%) were male and 265 (59%) were female. A majority of teachers were 41 to 50 year olds (48.3%); other groups included 23 to 30 year olds (5.6%), 31 to 40 year olds (33.8%), 51 to 60 year olds (11.4%) and 61 year olds and above (0.9%). A large percentage of teachers were married (83.1%) while 10.2 percent were single and 6.7 percent were divorced or widowed. Most of the teachers had bachelor's degrees (80.6%) while others had master's degrees (17.6%) and PhDs (1.8%).

A small number of teachers had management positions as principals (11.1%) and vice principals (8.3%). A large percentage of teachers had work experience from 20 to 29 years (42.3%); other categories included 1 to 9 years (13.1%), 10 to 19 years (38.8%), 30 to 39 years (5.4%) and 40 years and above (0.4%).

A large group of teachers were teaching at primary schools (39.4%), whereas others were categorized at pre-school (10.7%), secondary school (19.6%) and high school (30.3%) levels. Most of the teachers were branch teachers (46.1%), while others were pre-school teachers (10.9%), primary school teachers (35.2%), and technical and special education teachers (7.8%).

Branch teachers consisted of Turkish (7.8%), Maths (5.6%), Foreign Languages (6.5%), Social Sciences (5.3%), Physical Sciences (7.8%), Visual Arts (1.1%), Music (0.4%), Physical Education (1.8%), Philosophy (0.7%), Technology and Design (2.2%), Religious Culture and Ethics (4.0%) and Psychological Counselling and Guidance (2.9%).

More than half of teachers lived in metropolitans (52.1%) for the longest time; other groups lived in city (26.3%), district (19.2%), town (0.8%) and village (1.6%).

**Table 4.1.** Frequency results of demographic information

| Characteristics               | Answers                                 | Frequency (n) | Percentage (%) |
|-------------------------------|-----------------------------------------|---------------|----------------|
| <b>Gender</b>                 | Men                                     | 184           | 41             |
|                               | Women                                   | 265           | 59             |
| <b>Age (Years)</b>            | 23 to 30                                | 25            | 5.6            |
|                               | 31 to 40                                | 152           | 33.8           |
|                               | 41 to 50                                | 217           | 48.3           |
|                               | 51 to 60                                | 51            | 11.4           |
|                               | 61 and above                            | 4             | 0.9            |
| <b>Marital Status</b>         | Single                                  | 46            | 10.2           |
|                               | Married                                 | 373           | 83.1           |
|                               | Divorced/Widowed                        | 30            | 6.7            |
| <b>Education Level</b>        | Bachelor's Degree                       | 362           | 80.6           |
|                               | Master's Degree                         | 79            | 17.6           |
|                               | PhD                                     | 8             | 1.8            |
| <b>Position</b>               | Principal                               | 50            | 11.1           |
|                               | Vice Principal                          | 37            | 8.3            |
|                               | Teacher                                 | 362           | 80.6           |
| <b>Job Experience (Years)</b> | 1 to 9                                  | 59            | 13.1           |
|                               | 10 to 19                                | 174           | 38.8           |
|                               | 20 to 29                                | 190           | 42.3           |
|                               | 30 to 39                                | 24            | 5.4            |
|                               | 40 and above                            | 2             | 0.4            |
| <b>Teaching Level</b>         | Pre-School                              | 48            | 10.7           |
|                               | Primary School                          | 177           | 39.4           |
|                               | Secondary School                        | 88            | 19.6           |
|                               | High School                             | 136           | 30.3           |
| <b>Branch</b>                 | Pre-School Teacher                      | 49            | 10.9           |
|                               | Primary School Teacher                  | 158           | 35.2           |
|                               | Branch Teacher                          | 207           | 46.1           |
|                               | Technical and Special Education Teacher | 35            | 7.8            |
| <b>Settlement</b>             | Metropolitan                            | 234           | 52.1           |
|                               | City                                    | 118           | 26.3           |
|                               | District                                | 86            | 19.2           |
|                               | Town                                    | 4             | 0.8            |
|                               | Village                                 | 7             | 1.6            |
| <b>Total</b>                  |                                         | <b>449</b>    | <b>100.0</b>   |

Teachers' responses to general statements about the environment are shown in Table 4.2. According to Table 4.2, almost all of the teachers were interested in the subject of the environment (91.5%) and were sensitive to environmental issues (93.5%).

**Table 4.2.** Frequency results of the general statements about the environment

| Statement                                                                                                                                                                                                   | Responses                                                            | Frequency (n) | Percentage (%) |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|---------------|----------------|
| The subject of the environment interests me.                                                                                                                                                                | Yes                                                                  | 411           | 91.5           |
|                                                                                                                                                                                                             | No                                                                   | 2             | 0.4            |
|                                                                                                                                                                                                             | Sometimes                                                            | 18            | 4.0            |
|                                                                                                                                                                                                             | Depends on the topic                                                 | 18            | 4.0            |
| I am sensitive to environmental issues.                                                                                                                                                                     | Yes                                                                  | 420           | 93.5           |
|                                                                                                                                                                                                             | No                                                                   | 1             | 0.2            |
|                                                                                                                                                                                                             | Sometimes                                                            | 12            | 2.7            |
|                                                                                                                                                                                                             | Depends on the topic                                                 | 16            | 3.6            |
| There is an environmental problem where I live in.                                                                                                                                                          | Yes                                                                  | 381           | 84.9           |
|                                                                                                                                                                                                             | No                                                                   | 54            | 12.0           |
|                                                                                                                                                                                                             | No idea                                                              | 14            | 3.1            |
| If your answer to the previous question is yes, what kind of environmental problem do you observe?                                                                                                          | Environmental Pollution                                              | 234           | 52.1           |
|                                                                                                                                                                                                             | Deforestation                                                        | 24            | 5.3            |
|                                                                                                                                                                                                             | Unplanned Urbanization and Concretion                                | 57            | 12.7           |
|                                                                                                                                                                                                             | Infrastructure Problem                                               | 8             | 1.8            |
|                                                                                                                                                                                                             | Ineffectiveness of Waste Management and Recycling Activities         | 28            | 6.2            |
|                                                                                                                                                                                                             | Lack of Environmental Consciousness                                  | 25            | 5.6            |
|                                                                                                                                                                                                             | No Answer                                                            | 73            | 16.3           |
| Have you received an environmental education for environmental problems?                                                                                                                                    | Yes                                                                  | 83            | 18.5           |
|                                                                                                                                                                                                             | No                                                                   | 366           | 81.5           |
| I attend/have attended seminars, meetings or congresses for environmental problems.                                                                                                                         | Never                                                                | 108           | 24.1           |
|                                                                                                                                                                                                             | Sometimes                                                            | 279           | 62.1           |
|                                                                                                                                                                                                             | Often                                                                | 23            | 5.1            |
|                                                                                                                                                                                                             | Always                                                               | 39            | 8.7            |
| I am a member of any environmental NGOs.                                                                                                                                                                    | Yes                                                                  | 51            | 11.4           |
|                                                                                                                                                                                                             | No                                                                   | 398           | 88.6           |
| The source that contributed the most to my understanding and knowledge of environmental issues.                                                                                                             | Experts                                                              | 17            | 3.8            |
|                                                                                                                                                                                                             | Scientific Studies                                                   | 30            | 6.7            |
|                                                                                                                                                                                                             | Books & Magazines                                                    | 32            | 7.1            |
|                                                                                                                                                                                                             | Newspapers                                                           | 2             | 0.4            |
|                                                                                                                                                                                                             | TV Programs                                                          | 57            | 12.7           |
|                                                                                                                                                                                                             | Internet                                                             | 119           | 26.5           |
|                                                                                                                                                                                                             | Associations, Foundations or Institutions Related to the Environment | 25            | 5.6            |
|                                                                                                                                                                                                             | All of the above                                                     | 145           | 32.3           |
|                                                                                                                                                                                                             | None of the above                                                    | 5             | 1.1            |
|                                                                                                                                                                                                             | Personal Interest, Faith, Observations & Experiences                 | 17            | 3.8            |
| We discuss environmental issues/problems with my students.                                                                                                                                                  | Always                                                               | 237           | 52.8           |
|                                                                                                                                                                                                             | Sometimes                                                            | 208           | 46.3           |
|                                                                                                                                                                                                             | Never                                                                | 4             | 0.9            |
| I organize extracurricular activities that can help with the environmental problems and support the academic success of my students.                                                                        | Yes                                                                  | 289           | 64.4           |
|                                                                                                                                                                                                             | No                                                                   | 160           | 35.6           |
| I am involved in environmental research, study or project processes (preparation, execution or participation).                                                                                              | Yes                                                                  | 281           | 62.6           |
|                                                                                                                                                                                                             | No                                                                   | 168           | 37.4           |
| Sharing my knowledge, observations, experiences and ideas about environmental issues/problems with my colleagues and/or students; I try to raise awareness about finding solutions to environmental issues. | Yes                                                                  | 411           | 91.5           |
|                                                                                                                                                                                                             | No                                                                   | 38            | 8.5            |
| I have received an education on sustainable leadership.                                                                                                                                                     | Yes                                                                  | 43            | 9.6            |
|                                                                                                                                                                                                             | No                                                                   | 406           | 90.4           |
| <b>Total</b>                                                                                                                                                                                                |                                                                      | <b>449</b>    | <b>100.0</b>   |

A large group of teachers (84.9%) observed environmental problems where they live in. These problems categorized as environmental pollution (52.1%), deforestation (5.3%),

unplanned urbanization and concretion (12.7%), infrastructure problem (1.8%), ineffectiveness of waste management and recycling activities (6.2%), and lack of environmental consciousness (5.6%). However, a small group of teachers (16.3%) did not observe any environmental problem in their living area. 81.5% of teachers (n=366) have not received the environmental education about the environmental problems, but 18.5% (n=83) of them have received.

More than half of the teachers (62.1%) sometimes attended seminars, meetings or congresses for environmental problems, but 24.1% of them never attended. While a small percentage of teachers (11.4%) were member of any environmental NGOs, a large percentage of teachers (88.6%) did not have any membership. The most important sources that teachers benefit from about the environmental issues are internet (26.5%), TV programs (12.7%), books and magazines (7.1%), scientific studies (6.7%), associations, foundations or institutions related to the environment (5.6%), experts (3.8%) and newspapers (0.4%). However, a large group of teachers (32.3%) benefit from all these sources.

More than half of the teachers (52.8%) always discussed environmental issues or problems with their students, only 4 teachers (0.9%) never discussed these issues. While 64.4% of teachers organized extracurricular activities about environmental problems to support students' academic success, 35.6% of teachers did not organize these kind of activities. Out of 449 teachers, 281 (62.6%) were involved in environmental research, study or project processes, but 168 (37.4%) of them did not join any work.

Almost all of the teachers (91.5%) shared their knowledge and experiences with colleagues and/or students in order to raise environmental awareness about finding solutions to environmental issues. Only a small percentage of teachers (9.6%) have received education about sustainable leadership, whereas a large percentage of teachers (90.4%) have not received education about sustainable leadership.

Teachers' responses to the items of the environmental identity scale are given in Table 4.3.

**Table 4.3.** Responses to the EID Scale items

| Scale Items                                                                                                          | Responses                       | Frequency (n) | Percentage (%) |
|----------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------|----------------|
| <b>EID2:</b> Engaging in environmental behaviors is important to me.                                                 | Never True                      | 1             | 0.2            |
|                                                                                                                      | Sometimes but Infrequently True | 4             | 0.9            |
|                                                                                                                      | Neutral                         | 10            | 2.2            |
|                                                                                                                      | Sometimes True                  | 26            | 5.8            |
|                                                                                                                      | Usually True                    | 87            | 19.4           |
|                                                                                                                      | Always True                     | 321           | 71.5           |
| <b>EID3:</b> I think of myself as part of nature, not separate from it.                                              | Sometimes but Infrequently True | 3             | 0.7            |
|                                                                                                                      | Neutral                         | 8             | 1.8            |
|                                                                                                                      | Sometimes True                  | 32            | 7.1            |
|                                                                                                                      | Usually True                    | 79            | 17.6           |
|                                                                                                                      | Always True                     | 327           | 72.8           |
| <b>EID4:</b> If I had enough time or money, I would certainly devote some of it to working for environmental causes. | Rarely True                     | 1             | 0.2            |
|                                                                                                                      | Sometimes but Infrequently True | 6             | 1.3            |
|                                                                                                                      | Neutral                         | 25            | 5.6            |
|                                                                                                                      | Sometimes True                  | 60            | 13.4           |
|                                                                                                                      | Usually True                    | 101           | 22.5           |
|                                                                                                                      | Always True                     | 256           | 57.0           |
| <b>EID5:</b> When I am upset or stressed, I can feel better by spending some time outdoors "communing with nature."  | Never True                      | 1             | 0.2            |
|                                                                                                                      | Rarely True                     | 1             | 0.2            |
|                                                                                                                      | Neutral                         | 8             | 1.8            |
|                                                                                                                      | Sometimes True                  | 34            | 7.6            |
|                                                                                                                      | Usually True                    | 67            | 14.9           |
|                                                                                                                      | Always True                     | 338           | 75.3           |
| <b>EID7:</b> I have a lot in common with environmentalists as a group.                                               | Never True                      | 1             | 0.2            |
|                                                                                                                      | Rarely True                     | 6             | 1.3            |
|                                                                                                                      | Sometimes but Infrequently True | 15            | 3.3            |
|                                                                                                                      | Neutral                         | 62            | 13.8           |
|                                                                                                                      | Sometimes True                  | 120           | 26.7           |
|                                                                                                                      | Usually True                    | 109           | 24.3           |
|                                                                                                                      | Always True                     | 136           | 30.3           |
| <b>EID10:</b> I like to garden.                                                                                      | Neutral                         | 5             | 1.1            |
|                                                                                                                      | Sometimes True                  | 22            | 4.9            |
|                                                                                                                      | Usually True                    | 55            | 12.2           |
|                                                                                                                      | Always True                     | 367           | 81.7           |

As seen in Table 4.3, teachers' responses to the items of the the environmental identity scale were positive in general. Only a small part of teachers reflected negative and neutral responses to these items.

**Table 4.3. Continued**

|                                                                                                                                           |                                 |            |              |
|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------|--------------|
| <b>EID11:</b> Being a part of the ecosystem is an important part of who I am.                                                             | Never True                      | 1          | 0.2          |
|                                                                                                                                           | Neutral                         | 11         | 2.4          |
|                                                                                                                                           | Sometimes True                  | 32         | 7.1          |
|                                                                                                                                           | Usually True                    | 104        | 23.2         |
|                                                                                                                                           | Always True                     | 301        | 67.0         |
| <b>EID13:</b> Behaving responsibly toward the Earth - living a sustainable life-style is part of my moral code.                           | Neutral                         | 5          | 1.1          |
|                                                                                                                                           | Sometimes True                  | 25         | 5.6          |
|                                                                                                                                           | Usually True                    | 89         | 19.8         |
|                                                                                                                                           | Always True                     | 330        | 73.5         |
| <b>EID14:</b> Learning about the natural world should be an important part of every child's upbringing.                                   | Neutral                         | 5          | 1.1          |
|                                                                                                                                           | Sometimes True                  | 10         | 2.2          |
|                                                                                                                                           | Usually True                    | 76         | 16.9         |
|                                                                                                                                           | Always True                     | 358        | 79.7         |
| <b>EID15:</b> In general, being part of the natural world is an important part of my self-image.                                          | Neutral                         | 10         | 2.2          |
|                                                                                                                                           | Sometimes True                  | 45         | 10.0         |
|                                                                                                                                           | Usually True                    | 127        | 28.3         |
|                                                                                                                                           | Always True                     | 267        | 59.5         |
| <b>EID18:</b> Sometimes I feel like parts of nature - certain trees, or storms, or mountains - have a personality of their own.           | Never True                      | 2          | 0.4          |
|                                                                                                                                           | Rarely True                     | 2          | 0.4          |
|                                                                                                                                           | Sometimes but Infrequently True | 6          | 1.3          |
|                                                                                                                                           | Neutral                         | 19         | 4.2          |
|                                                                                                                                           | Sometimes True                  | 57         | 12.7         |
|                                                                                                                                           | Usually True                    | 119        | 26.5         |
|                                                                                                                                           | Always True                     | 244        | 54.3         |
|                                                                                                                                           |                                 |            |              |
| <b>EID19:</b> I would feel that an important part of my life was missing if I was not able to get out and enjoy nature from time to time. | Never True                      | 3          | 0.7          |
|                                                                                                                                           | Rarely True                     | 1          | 0.2          |
|                                                                                                                                           | Sometimes but Infrequently True | 7          | 1.6          |
|                                                                                                                                           | Neutral                         | 10         | 2.2          |
|                                                                                                                                           | Sometimes True                  | 39         | 8.7          |
|                                                                                                                                           | Usually True                    | 100        | 22.3         |
|                                                                                                                                           | Always True                     | 289        | 64.4         |
| <b>EID22:</b> My own interests usually seem to coincide with the position advocated by environmentalists.                                 | Rarely True                     | 3          | 0.7          |
|                                                                                                                                           | Sometimes but Infrequently True | 8          | 1.8          |
|                                                                                                                                           | Neutral                         | 30         | 6.7          |
|                                                                                                                                           | Sometimes True                  | 91         | 20.3         |
|                                                                                                                                           | Usually True                    | 145        | 32.3         |
|                                                                                                                                           | Always True                     | 172        | 38.3         |
| <b>Total</b>                                                                                                                              |                                 | <b>449</b> | <b>100.0</b> |

Following Table 4.3, teachers' responses to the items of the environmental attitude scale can be seen in Table 4.4.

**Table 4.4.** Responses to the EAT Scale items

| Scale Items                                                                                                                                       | Responses                  | Frequency (n) | Percentage (%) |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------|----------------|
| <b>EAT7:</b> Some works dealing with protecting sea turtles seen on some beaches in the South are futile efforts.                                 | Strongly disagree          | 351           | 78.2           |
|                                                                                                                                                   | Disagree                   | 61            | 13.6           |
|                                                                                                                                                   | Neither agree Nor disagree | 15            | 3.3            |
|                                                                                                                                                   | Agree                      | 14            | 3.1            |
|                                                                                                                                                   | Strongly agree             | 8             | 1.8            |
| <b>EAT8:</b> Turkey does not have the problem of desertification.                                                                                 | Strongly disagree          | 321           | 71.5           |
|                                                                                                                                                   | Disagree                   | 78            | 17.4           |
|                                                                                                                                                   | Neither agree Nor disagree | 32            | 7.1            |
|                                                                                                                                                   | Agree                      | 11            | 2.4            |
|                                                                                                                                                   | Strongly agree             | 7             | 1.6            |
| <b>EAT15:</b> Squatter settlements are not environmental problem.                                                                                 | Strongly disagree          | 310           | 69.0           |
|                                                                                                                                                   | Disagree                   | 67            | 14.9           |
|                                                                                                                                                   | Neither agree Nor disagree | 37            | 8.2            |
|                                                                                                                                                   | Agree                      | 17            | 3.8            |
|                                                                                                                                                   | Strongly agree             | 18            | 4.0            |
| <b>EAT16:</b> The idea of environmental protection was put forward by West countries in order to prevent the development of developing countries. | Strongly disagree          | 315           | 70.2           |
|                                                                                                                                                   | Disagree                   | 71            | 15.8           |
|                                                                                                                                                   | Neither agree Nor disagree | 40            | 8.9            |
|                                                                                                                                                   | Agree                      | 11            | 2.4            |
|                                                                                                                                                   | Strongly agree             | 12            | 2.7            |
| <b>EAT18:</b> Emergence of environmental groups is the result of belonging needs rather than the mission of protecting environment.               | Strongly disagree          | 273           | 60.8           |
|                                                                                                                                                   | Disagree                   | 76            | 16.9           |
|                                                                                                                                                   | Neither agree Nor disagree | 67            | 14.9           |
|                                                                                                                                                   | Agree                      | 21            | 4.7            |
|                                                                                                                                                   | Strongly agree             | 12            | 2.7            |
| <b>Total</b>                                                                                                                                      |                            | <b>449</b>    | <b>100.0</b>   |

According to Table 4.4, it can be said that a large number of teachers were agree about the existence of environmental problems, and importance of the initiatives which were taken to combat with environmental issues.

For the items of the sustainable leadership scale, teachers' responses are presented in Table 4.5.

**Table 4.5.** Responses to the the SLE Scale items

| Scale Items                                                                                     | Responses                  | Frequency (n) | Percentage (%) |
|-------------------------------------------------------------------------------------------------|----------------------------|---------------|----------------|
| <b>SLE1:</b> I am aware of sustainable leadership.                                              | Strongly disagree          | 14            | 3.1            |
|                                                                                                 | Disagree                   | 17            | 3.8            |
|                                                                                                 | Neither agree Nor disagree | 118           | 26.3           |
|                                                                                                 | Agree                      | 124           | 27.6           |
|                                                                                                 | Strongly agree             | 176           | 39.2           |
| <b>SLE2:</b> Sustainable leadership is a good innovative concept.                               | Strongly disagree          | 3             | 0.7            |
|                                                                                                 | Disagree                   | 7             | 1.6            |
|                                                                                                 | Neither agree Nor disagree | 81            | 18.0           |
|                                                                                                 | Agree                      | 137           | 30.5           |
|                                                                                                 | Strongly agree             | 221           | 49.2           |
| <b>SLE3:</b> I think that effective leadership can bring sustainable culture within our school. | Strongly disagree          | 4             | 0.9            |
|                                                                                                 | Disagree                   | 5             | 1.1            |
|                                                                                                 | Neither agree Nor disagree | 78            | 17.4           |
|                                                                                                 | Agree                      | 128           | 28.5           |
|                                                                                                 | Strongly agree             | 234           | 52.1           |
| <b>SLE4:</b> Nurturing the core competencies can enhance the sustainable culture.               | Strongly disagree          | 1             | 0.2            |
|                                                                                                 | Disagree                   | 7             | 1.6            |
|                                                                                                 | Neither agree Nor disagree | 76            | 16.9           |
|                                                                                                 | Agree                      | 134           | 29.8           |
|                                                                                                 | Strongly agree             | 231           | 51.4           |

As seen in Table 4.5, while most of the teachers had an idea about the sustainable leadership, an important percentage of teachers (26.3%) had no idea about this concept. More than half of the teachers (52.1%) thought that sustainable leadership can develop schools and create sustainable culture in education system. In addition, they believed that improvement of core competencies can strengthen the sustainable culture.

**Table 4.5. Continued**

|                                                                                                                                      |                            |            |              |
|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------|--------------|
| <b>SLE5:</b> Sustainable leadership as a whole supports the environment protection activity and development.                         | Disagree                   | 4          | 0.9          |
|                                                                                                                                      | Neither agree Nor disagree | 73         | 16.3         |
|                                                                                                                                      | Agree                      | 131        | 29.2         |
|                                                                                                                                      | Strongly agree             | 241        | 53.7         |
| <b>SLE6:</b> Sustainable leadership is capable of creating sustainable solution.                                                     | Strongly disagree          | 3          | 0.7          |
|                                                                                                                                      | Disagree                   | 6          | 1.3          |
|                                                                                                                                      | Neither agree Nor disagree | 68         | 15.1         |
|                                                                                                                                      | Agree                      | 129        | 28.7         |
|                                                                                                                                      | Strongly agree             | 243        | 54.1         |
| <b>SLE7:</b> Enhancing the core competencies can inculcate sustainable competitive advantage.                                        | Strongly disagree          | 2          | 0.4          |
|                                                                                                                                      | Disagree                   | 8          | 1.8          |
|                                                                                                                                      | Neither agree Nor disagree | 117        | 26.1         |
|                                                                                                                                      | Agree                      | 127        | 28.3         |
|                                                                                                                                      | Strongly agree             | 195        | 43.4         |
| <b>SLE8:</b> The concept of sustainable leadership involves eco-friendly leadership practices and preservation of knowledge capital. | Strongly disagree          | 1          | 0.2          |
|                                                                                                                                      | Disagree                   | 5          | 1.1          |
|                                                                                                                                      | Neither agree Nor disagree | 106        | 23.6         |
|                                                                                                                                      | Agree                      | 126        | 28.1         |
|                                                                                                                                      | Strongly agree             | 211        | 47.0         |
| <b>Total</b>                                                                                                                         |                            | <b>449</b> | <b>100.0</b> |

In the context of the environment, more than half of the teachers thought that sustainable leadership can help the protection and development of the environment. They saw that sustainable leadership is related to eco-friendly leadership, and can create sustainable solution, provide competitive advantage and preserve knowledge capital.

Descriptive statistics of the scales are summarized in Table 4.6. As seen in Table 4.6, the mean value of each scale item is almost close to the maximum value of the scale except for EID7, EID22 and SLE1. It can be seen that mod values are equal to the maximum values of the scales.

**Table 4.6.** Descriptive statistics results of the scales

| Item  | Mean | Median | Mode | Standard Deviation | Variance | Minimum | Maximum | Range |
|-------|------|--------|------|--------------------|----------|---------|---------|-------|
| EID2  | 6.57 | 7      | 7    | 0.818              | 0.669    | 1       | 7       | 6     |
| EID3  | 6.60 | 7      | 7    | 0.755              | 0.571    | 3       | 7       | 4     |
| EID4  | 6.28 | 7      | 7    | 1.004              | 1.008    | 2       | 7       | 5     |
| EID5  | 6.62 | 7      | 7    | 0.779              | 0.606    | 1       | 7       | 6     |
| EID7  | 5.59 | 6      | 7    | 1.238              | 1.532    | 1       | 7       | 6     |
| EID10 | 6.75 | 7      | 7    | 0.596              | 0.355    | 4       | 7       | 3     |
| EID11 | 6.54 | 7      | 7    | 0.779              | 0.606    | 1       | 7       | 6     |
| EID13 | 6.66 | 7      | 7    | 0.636              | 0.404    | 4       | 7       | 3     |
| EID14 | 6.75 | 7      | 7    | 0.546              | 0.298    | 4       | 7       | 3     |
| EID15 | 6.45 | 7      | 7    | 0.763              | 0.583    | 4       | 7       | 3     |
| EID18 | 6.25 | 7      | 7    | 1.040              | 1.082    | 1       | 7       | 6     |
| EID19 | 6.42 | 7      | 7    | 0.993              | 0.986    | 1       | 7       | 6     |
| EID22 | 5.97 | 6      | 7    | 1.059              | 1.122    | 2       | 7       | 5     |
| EAT7  | 4.63 | 5      | 5    | 0.838              | 0.702    | 1       | 5       | 4     |
| EAT8  | 4.55 | 5      | 5    | 0.852              | 0.726    | 1       | 5       | 4     |
| EAT15 | 4.41 | 5      | 5    | 1.057              | 1.118    | 1       | 5       | 4     |
| EAT16 | 4.48 | 5      | 5    | 0.947              | 0.898    | 1       | 5       | 4     |
| EAT18 | 4.29 | 5      | 5    | 1.052              | 1.106    | 1       | 5       | 4     |
| SLE1  | 3.96 | 4      | 5    | 1.043              | 1.088    | 1       | 5       | 4     |
| SLE2  | 4.26 | 4      | 5    | 0.854              | 0.729    | 1       | 5       | 4     |
| SLE3  | 4.30 | 5      | 5    | 0.856              | 0.732    | 1       | 5       | 4     |
| SLE4  | 4.31 | 5      | 5    | 0.820              | 0.673    | 1       | 5       | 4     |
| SLE5  | 4.36 | 5      | 5    | 0.781              | 0.609    | 2       | 5       | 3     |
| SLE6  | 4.34 | 5      | 5    | 0.831              | 0.690    | 1       | 5       | 4     |
| SLE7  | 4.12 | 4      | 5    | 0.890              | 0.792    | 1       | 5       | 4     |
| SLE8  | 4.20 | 4      | 5    | 0.855              | 0.730    | 1       | 5       | 4     |

## 4.2. The Results of the Hypothesis Test

The path coefficients and the test results of the structural equation model created to test the hypotheses of the research are shown in Table 4.7 and Figure 4.1.

**Table 4.7.** Test results of the hypotheses and path coefficients

| Hypothesis | Path                 | $\beta$ | Mean (M) | STDEV | T Statistics | P Values | CI (2.5%) | CI (97.5%) | Decision      |
|------------|----------------------|---------|----------|-------|--------------|----------|-----------|------------|---------------|
| <b>H1</b>  | <b>EID -&gt; EAT</b> | 0.247   | 0.258    | 0.057 | 4.345        | 0.000    | 0.148     | 0.366      | <b>Accept</b> |
| <b>H2</b>  | <b>EID -&gt; SLE</b> | 0.403   | 0.411    | 0.038 | 10.682       | 0.000    | 0.339     | 0.480      | <b>Accept</b> |
| <b>H3</b>  | <b>SLE -&gt; EAT</b> | 0.128   | 0.131    | 0.055 | 2.326        | 0.024    | 0.017     | 0.245      | <b>Accept</b> |

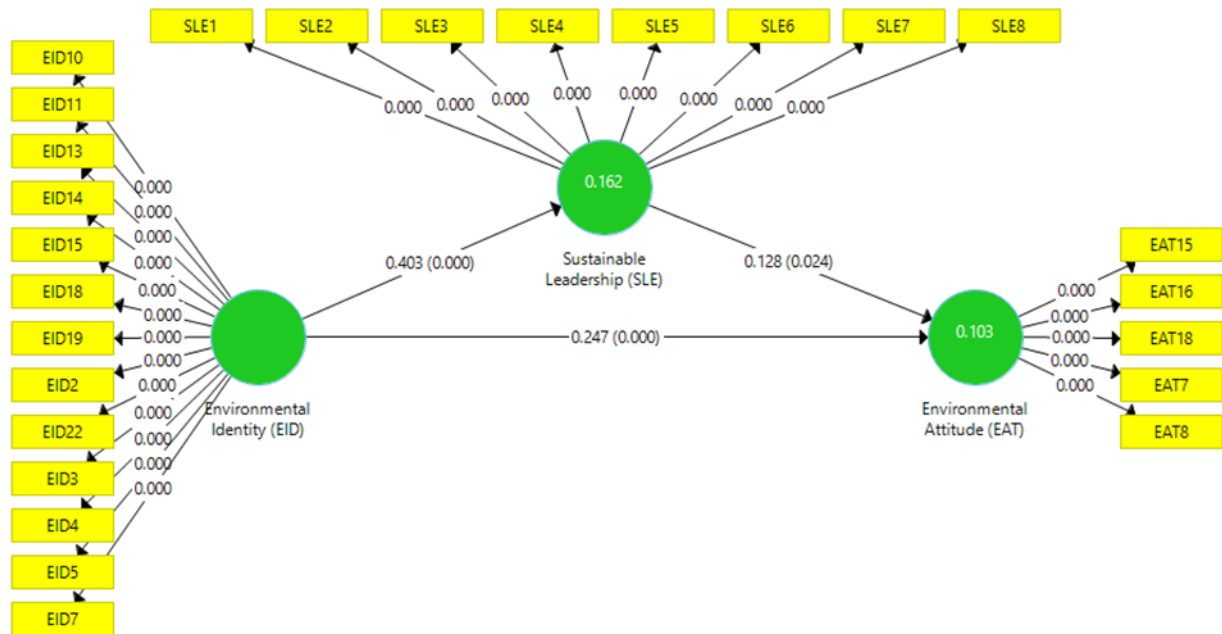


**Figure 4.1.** SmartPLS-SEM-Outer model path coefficients and p values

In table 4.7, path coefficients of the structural equation model were shown by  $\beta$  coefficients. Due to T statistics values of path coefficient values are greater than 1.96, p values of coefficient values are less than 0.05, CI (2.5%) and CI (97.5%) are not included 0; it can be stated that all relationships are supported and H1, H2, and H3 are accepted according to 95% trust level in the model (Çakır, 2019; Yıldız, 2020). These results can also be seen in the structural equation model in Figure 4.1.

Four results can be seen in Figure 4.1. These are the p values of the factor loadings, path coefficients, p values of path coefficients and  $R^2$  values. The values written on the arrows between the latent variables and indicators indicate p values of the factor loadings. The values written on the arrows between the three latent variables show the path coefficients, and p values of the path coefficients in parentheses. The values written in latent variable are  $R^2$  values.

### 4.3. The Results of the Mediating Role

The results of the first condition to determine the mediating role based on Baron and Kenny (1986) are shown in Figure 4.2. According to Figure 4.2, it can be seen that the environmental identity has positive effect on environmental attitude without mediator variable (sustainable leadership).



**Figure 4.2.** The results of 1st condition for the mediating role

As seen in Figure 4.2, the relationship between EID and EAT is statistically significant ( $\beta=0.306$ ,  $p=0.00<0.05$ ). The values written on the arrows between the latent variable and indicators show T values of the factors. The value written in the latent variable indicate  $R^2$  value ( $R^2=0.093$ ).

Second, third and fourth conditions of the mediating role analysis are summarized in Figure 4.3 and Table 4.8. As seen in Figure 4.3, it can be indicated that the relationship between EID and SLE ( $p=0.00<0.05$ ) and between SLE and EAT ( $p=0.024<0.05$ ) are statistically significant. It can be stated that these results provided the second and the third conditions. When the mediator variable added to the analysis, it was seen that Beta coefficient decreased from  $\beta=0.306$  to  $\beta=0.247$  on the relationship between environmental identity and environmental attitude. This result provided the fourth condition and indicate a partial mediating role. T values of the factors and  $R^2$  values can also be seen in Figure 4.3. The

results of the direct, indirect and total effects can be seen in Table 4.8. According to Table 4.8,  $a=0.403$  indicates the path coefficient between the environmental identity and sustainable leadership,  $b=0.128$  indicates the path coefficient between the sustainable leadership and the environmental attitude, and  $c=0.306$  indicates direct effect of environmental identity on the environmental attitude when the sustainable leadership was not included in the analysis.

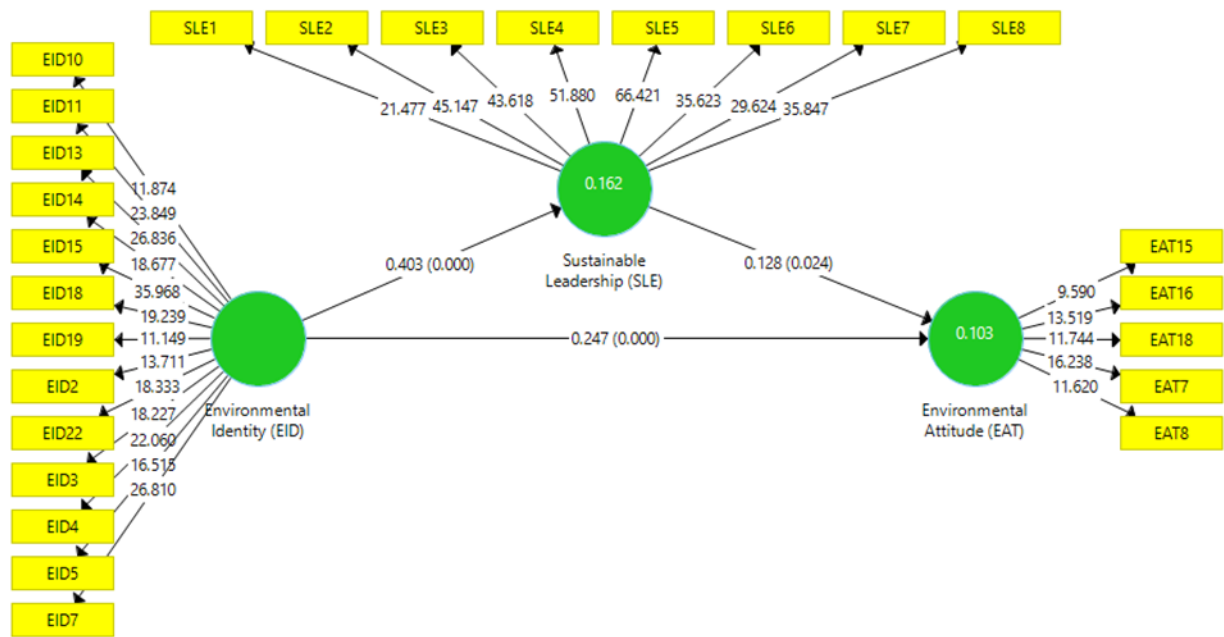


**Figure 4.3.** The results of 2nd, 3rd and 4th conditions for the mediating role

**Table 4.8.** The results of the mediating role

| Hypothesis | Path              | a     | b     | c     | a*b   | a*b+c | VAF  | T Statistic | P Value | CI (2.5%) | CI (97.5%) | Decision                  |
|------------|-------------------|-------|-------|-------|-------|-------|------|-------------|---------|-----------|------------|---------------------------|
| H4         | EID -> SLE -> EAT | 0.403 | 0.128 | 0.306 | 0.052 | 0.358 | 0.13 | 2.106       | 0.036   | 0.009     | 0.102      | Reject/No Mediator Effect |

According to a, b and c path coefficients in Table 4.8,  $a*b$  indicates the indirect effect and  $a*b+c$  indicates the total effect. Although it can be stated that the sustainable leadership has a mediating role on the relationship between teachers' environmental identity and environmental attitude based on the conditions of Baron and Kenny (1986), the significance of mediating role should be tested by calculation of VAF (Variance Accounted For) coefficient (Hair et al., 2017). According to Hair et al. (2017) VAF coefficient is calculated by the formula as  $VAF = (a*b)/(a*b)+(a*b+c)$ . Calculating VAF by this formula,  $VAF = 0.052/0.052+0.358 = 0.052/0.410=0.13$ .

According to Hair et al. (2017),  $VAF > 0.80$  indicates full mediator effect,  $0.20 \leq VAF \leq 0.80$  indicates partial mediator effect, and  $VAF < 0.20$  indicates no mediator effect. It can be seen that calculated  $VAF = 0.13 < 0.20$ . Therefore, it can be said that the mediating role of sustainable leadership between teachers' environmental identity and environmental attitude was not statistically significant. Thus, H4 is rejected. So, it is decided that the sustainable leadership does not have a mediating role on the relationship between teachers' environmental identity and environmental attitude in the study. In the mediator effect analysis, it is expected that  $R^2$  increase when mediator variable added to the model (Yıldız, 2020). While  $R^2$  was 0.093 in Figure 4.2, it was 0.103 in Figure 4.3. This result indicate that the  $R^2$  increased only 1% in the model.

#### 4.4. The Results of the Independent Samples t Test for EID, EAT and SLE Levels

##### 4.4.1. The t-test Results in Terms of Gender

Teachers' environmental identity ( $t[447] = -0.567$ ;  $p = 0.571 > 0.05$ ) and sustainable leadership ( $t[447] = 0.261$ ;  $p = 0.794 > 0.05$ ) levels do not show statistically significant differences in terms of gender. However, significant differences were found between male and female teachers' environmental attitude levels ( $t[365.28] = -2.531$ ;  $p = 0.012 < 0.05$ ). Female teachers' environmental attitude levels ( $\bar{x} = 4.5358$ ) are higher than male teachers' environmental attitude levels ( $\bar{x} = 4.3804$ ). In this case, it can be said that women seems more sensitive about their attitude towards the environment than men. Descriptive statistics and t-test results for EID, EAT and SLE levels in terms of gender are shown in Table 4.9.

**Table 4.9.** t-test results in terms of gender

| Scale      | Group | N   | Mean   | Std. Deviation | Levene's Test (p value) | Homogeneity of Variance     | t      | df     | p     |
|------------|-------|-----|--------|----------------|-------------------------|-----------------------------|--------|--------|-------|
| <b>EID</b> | Men   | 184 | 6.4013 | 0.60203        | 0.099                   | Equal variances assumed     | -0.567 | 447    | 0.571 |
|            | Women | 265 | 6.4322 | 0.54167        |                         |                             |        |        |       |
| <b>EAT</b> | Men   | 184 | 4.3804 | 0.66747        | 0.045                   | Equal variances not assumed | -2.531 | 365.28 | 0.012 |
|            | Women | 265 | 4.5358 | 0.59820        |                         |                             |        |        |       |
| <b>SLE</b> | Men   | 184 | 4.2425 | 0.72466        | 0.967                   | Equal variances assumed     | 0.261  | 447    | 0.794 |
|            | Women | 265 | 4.2245 | 0.71448        |                         |                             |        |        |       |

#### 4.4.2. The t-test Results in Terms of Environmental Education

Descriptive statistics and t-test results for EID, EAT and SLE levels in terms of whether or not teachers received environmental education are presented in Table 4.10. The results show that significant differences were not found between teachers' environmental attitude levels ( $t[447]=0.888$ ;  $p=0.375>0.05$ ) in terms of environmental education. However, teachers' environmental identity ( $t[159.245]=3.759$ ;  $p=0.000<0.05$ ) and sustainable leadership ( $t[130.381]=2.317$ ;  $p=0.022<0.05$ ) levels show statistically significant differences in terms of environmental education. Teachers who received environmental education have higher environmental identity levels ( $\bar{x}=6.5922$ ) than teachers who have not received environmental education ( $\bar{x}=6.3804$ ). Also, it is seen that teachers who received environmental education ( $\bar{x}=4.3870$ ) have higher sustainable leadership levels than teachers who have not received environmental education ( $\bar{x}=4.1967$ ). In this case, it can be said that environmental education helps teachers to understand environmental identity and sustainable leadership better.

**Table 4.10.** t-test results in terms of environmental education

| Scale | Group | N   | Mean   | Std. Deviation | Levene's Test (p value) | Homogeneity of Variance     | t     | df      | p     |
|-------|-------|-----|--------|----------------|-------------------------|-----------------------------|-------|---------|-------|
| EID   | Yes   | 83  | 6.5922 | 0.43060        | 0.014                   | Equal variances not assumed | 3.759 | 159.245 | 0.000 |
|       | No    | 366 | 6.3804 | 0.58673        |                         |                             |       |         |       |
| EAT   | Yes   | 83  | 4.5277 | 0.60774        | 0.265                   | Equal variances assumed     | 0.888 | 447     | 0.375 |
|       | No    | 366 | 4.4596 | 0.63682        |                         |                             |       |         |       |
| SLE   | Yes   | 83  | 4.3870 | 0.66363        | 0.035                   | Equal variances not assumed | 2.317 | 130.381 | 0.022 |
|       | No    | 366 | 4.1967 | 0.72591        |                         |                             |       |         |       |

#### 4.4.3. The t-test Results in Terms of Environmental NGOs Membership

As seen in Table 4.11, teachers' environmental identity ( $t[83.966]=4.284$ ;  $p=0.00<0.05$ ) and environmental attitude ( $t[74.389]=3.114$ ;  $p=0.002$ ) levels show statistically significant differences in terms of environmental NGOs membership. Teachers who are member of any environmental NGOs have higher environmental identity levels ( $\bar{x}=6.6486$ ) than teachers who are not member of any environmental NGOs ( $\bar{x}=6.3902$ ). Teachers who have membership of environmental NGOs also have higher environmental attitude levels ( $\bar{x}=4.6824$ ) than teachers who have not membership of any environmental NGOs ( $\bar{x}=4.4452$ ). But, teachers' sustainable leadership levels do not show statistically significant difference ( $t[447]=0.838$ ;  $p=0.402>0.05$ ) in terms of environmental NGOs membership. It can be stated that being member of

environmental NGOs has a positive effect on environmental identity and sustainable leadership.

**Table 4.11.** t-test results in terms of environmental NGOs membership

| Scale      | Group | N   | Mean   | Std. Deviation | Levene's Test (p value) | Homogeneity of Variance     | t     | df     | p     |
|------------|-------|-----|--------|----------------|-------------------------|-----------------------------|-------|--------|-------|
| <b>EID</b> | Yes   | 51  | 6.6486 | 0.37724        | 0.004                   | Equal variances not assumed | 4.284 | 83.966 | 0.000 |
|            | No    | 398 | 6.3902 | 0.58045        |                         |                             |       |        |       |
| <b>EAT</b> | Yes   | 51  | 4.6824 | 0.48691        | 0.011                   | Equal variances not assumed | 3.144 | 74.389 | 0.002 |
|            | No    | 398 | 4.4452 | 0.64317        |                         |                             |       |        |       |
| <b>SLE</b> | Yes   | 51  | 4.3113 | 0.71823        | 0.754                   | Equal variances assumed     | 0.838 | 447    | 0.402 |
|            | No    | 398 | 4.2217 | 0.71814        |                         |                             |       |        |       |

#### 4.4.4. The t-test Results in Terms of Extracurricular Activities

According to Table 4.12, teachers' environmental identity ( $t[285.994]=3.210$ ;  $p=0.001<0.05$ ) and sustainable leadership ( $t[447]=2.500$ ;  $p=0.013<0.05$ ) levels show statistically significant differences in terms of extracurricular activities. Teachers who organize extracurricular activities to encourage their students about environmental protection have higher environmental identity levels ( $\bar{x}=6.4858$ ) than teachers who do not organize these activities ( $\bar{x}=6.3000$ ). Teachers who organize extracurricular activities ( $\bar{x}=4.2946$ ) also have higher sustainable leadership levels than teachers who do not organize these activities ( $\bar{x}=4.1188$ ). However, teachers' environmental attitude levels do not show statistically significant differences according to extracurricular activities ( $t[447]=0.928$ ;  $p=0.354>0.05$ ). When teachers organize these kind of activities, they lead someone to do something. This shows one of the characteristics of sustainable leadership. Therefore, it can be said that sustainable leadership affected from environmentally friendly activities positively. It can also be stated that environmentally friendly activities positively contribute to the environmental identity.

**Table 4.12.** t-test results in terms of extracurricular activities

| Scale      | Group | N   | Mean   | Std. Deviation | Levene's Test (p value) | Homogeneity of Variance     | t     | df      | p     |
|------------|-------|-----|--------|----------------|-------------------------|-----------------------------|-------|---------|-------|
| <b>EID</b> | Yes   | 289 | 6.4858 | 0.52522        | 0.028                   | Equal variances not assumed | 3.210 | 285.994 | 0.001 |
|            | No    | 160 | 6.3000 | 0.61883        |                         |                             |       |         |       |
| <b>EAT</b> | Yes   | 289 | 4.4927 | 0.60986        | 0.167                   | Equal variances assumed     | 0.928 | 447     | 0.354 |
|            | No    | 160 | 4.4350 | 0.66901        |                         |                             |       |         |       |
| <b>SLE</b> | Yes   | 289 | 4.2946 | 0.70142        | 0.701                   | Equal variances assumed     | 2.500 | 447     | 0.013 |
|            | No    | 160 | 4.1188 | 0.73555        |                         |                             |       |         |       |

#### 4.4.5. The t-test Results in Terms of Taking Part in Environmental Works

Teachers' environmental identity ( $t[309.022]=4.263$ ;  $p=0.000<0.05$ ), environmental attitude ( $t[447]=2.159$ ;  $p=0.031<0.05$ ) and sustainable leadership ( $t[447]=2.870$ ;  $p=0.004<0.05$ ) levels show significant differences in terms of taking part in environmental works (research, study or project process). As seen in Table 4.13, teachers who take part in environmental works show higher environmental identity levels ( $\bar{x}=6.5094$ ) than teachers who do not take part in environmental works ( $\bar{x}=6.2692$ ). Teachers who take part in environmental works have higher environmental attitude levels ( $\bar{x}=4.5217$ ) than teachers who did not take part in these works ( $\bar{x}=4.3893$ ). Teachers who take part in environmental works have higher sustainable leadership levels ( $\bar{x}=4.3065$ ) than others who do not take part in these works ( $\bar{x}=4.1071$ ). According to these results, it can be indicated that research, study or projects about environment have positive effects on environmental identity, environmental attitude and sustainable leadership levels of teachers.

**Table 4.13.** t-test results in terms of taking part in environmental works

| Scale      | Group | N   | Mean   | Std. Deviation | Levene's Test (p value) | Homogeneity of Variance     | t     | df      | p     |
|------------|-------|-----|--------|----------------|-------------------------|-----------------------------|-------|---------|-------|
| <b>EID</b> | Yes   | 281 | 6.5094 | 0.52010        | 0.040                   | Equal variances not assumed | 4.263 | 309.022 | 0.000 |
|            | No    | 168 | 6.2692 | 0.60972        |                         |                             |       |         |       |
| <b>EAT</b> | Yes   | 281 | 4.5217 | 0.60296        | 0.138                   | Equal variances assumed     | 2.159 | 447     | 0.031 |
|            | No    | 168 | 4.3893 | 0.67006        |                         |                             |       |         |       |
| <b>SLE</b> | Yes   | 281 | 4.3065 | 0.68732        | 0.068                   | Equal variances assumed     | 2.870 | 447     | 0.004 |
|            | No    | 168 | 4.1071 | 0.75203        |                         |                             |       |         |       |

#### 4.4.6. The t-test Results in Terms of Sharing Experiences to Raise Environmental Awareness

While teachers' environmental identity levels show statistically significant differences in terms of sharing experiences to raise environmental awareness ( $t[41.112]=3.449$ ;  $p=0.001<0.05$ ), their environmental attitude levels ( $t[447]=-0.284$ ;  $p=0.777>0.05$ ) and sustainable leadership levels ( $t[447]=1.850$ ;  $p=0.065>0.05$ ) do not show statistically significant difference in terms of sharing experiences to raise environmental awareness. The results are shown in Table 4.14.

Teachers who share their experiences about the environment and try to raise environmental awareness have higher environmental identity levels ( $\bar{x}=6.4539$ ) than teachers who do not share their experiences and do not try to raise awareness about this subject ( $\bar{x}=6.0486$ ). This result may be due to the emergence of environmental identity through direct and personal experiences with the natural world.

**Table 4.14.** t test results in terms of sharing experiences to raise environmental awareness

| Scale | Group | N   | Mean   | Std. Deviation | Levene's Test (p value) | Homogeneity of Variance     | t      | df     | p     |
|-------|-------|-----|--------|----------------|-------------------------|-----------------------------|--------|--------|-------|
| EID   | Yes   | 411 | 6.4539 | 0.54045        | 0.022                   | Equal variances not assumed | 3.449  | 41.112 | 0.001 |
|       | No    | 38  | 6.0486 | 0.70556        |                         |                             |        |        |       |
| EAT   | Yes   | 411 | 4.4696 | 0.63563        | 0.286                   | Equal variances assumed     | -0.284 | 447    | 0.777 |
|       | No    | 38  | 4.5000 | 0.59138        |                         |                             |        |        |       |
| SLE   | Yes   | 411 | 4.2509 | 0.70853        | 0.470                   | Equal variances assumed     | 1.850  | 447    | 0.065 |
|       | No    | 38  | 4.0263 | 0.79385        |                         |                             |        |        |       |

#### 4.4.7. The t-test Results in Terms of Education About Sustainable Leadership

According to Table 4.15, teachers' sustainable leadership levels show statistically significant differences in terms of education about sustainable leadership ( $t[447]=2.137$ ;  $p=0.033<0.05$ ) whereas their environmental identity ( $t[447]=0.641$ ;  $p=0.522>0.05$ ) and environmental attitude ( $t[447]=-0.178$ ;  $p=0.859>0.05$ ) levels do not show statistically significant differences in terms of education about the sustainable leadership. Teachers who received education about sustainable leadership have higher sustainable leadership levels ( $\bar{x}=4.4535$ ) than teachers who did not received this education ( $\bar{x}=4.2084$ ). This difference may arise from the important role of education on sustainability and leadership.

**Table 4.15.** t-test results in terms of education about sustainable leadership

| Scale | Group | N   | Mean   | Std. Deviation | Levene's Test (p value) | Homogeneity of Variance | t      | df  | p     |
|-------|-------|-----|--------|----------------|-------------------------|-------------------------|--------|-----|-------|
| EID   | Yes   | 43  | 6.4723 | 0.63245        | 0.582                   | Equal variances assumed | 0.641  | 447 | 0.522 |
|       | No    | 406 | 6.4140 | 0.55989        |                         |                         |        |     |       |
| EAT   | Yes   | 43  | 4.4558 | 0.71624        | 0.288                   | Equal variances assumed | -0.178 | 447 | 0.859 |
|       | No    | 406 | 4.4739 | 0.62274        |                         |                         |        |     |       |
| SLE   | Yes   | 43  | 4.4535 | 0.75150        | 0.654                   | Equal variances assumed | 2.137  | 447 | 0.033 |
|       | No    | 406 | 4.2084 | 0.71119        |                         |                         |        |     |       |

#### 4.5. The Results of One Way ANOVA for EID, EAT and SLE Levels

##### 4.5.1. The Results of ANOVA in Terms of Age Groups

Descriptive statistics for age groups with respect to environmental identity, environmental attitude and sustainable leadership levels are presented in Table 4.16. This table shows means scores for each scale, Levene's test results and homogeneity of variances for scales. According to this table, it is seen that equal variances assumed for environmental identity ( $p=0.311>0.05$ ) and environmental attitude ( $p=0.080>0.05$ ) levels, but equal variances not assumed for sustainable leadership levels ( $p=0.047<0.05$ ). Taking into consideration these findings, the ANOVA results were evaluated and presented in Table 4.17.

**Table 4.16.** Descriptive statistics for age groups

| Scale | Group | Age (Year)   | N   | Mean   | Std. Deviation | Levene's Test (p value) | Homogeneity of Variance     |
|-------|-------|--------------|-----|--------|----------------|-------------------------|-----------------------------|
| EID   | 1     | 23 to 30     | 25  | 6.5846 | 0.41603        | 0.311                   | Equal variances assumed     |
|       | 2     | 31 to 40     | 152 | 6.3527 | 0.56875        |                         |                             |
|       | 3     | 41 to 50     | 217 | 6.4548 | 0.55936        |                         |                             |
|       | 4     | 51 to 60     | 51  | 6.3846 | 0.65290        |                         |                             |
|       | 5     | 61 and above | 4   | 6.4615 | 0.31404        |                         |                             |
| EAT   | 1     | 23 to 30     | 25  | 4.5040 | 0.58912        | 0.080                   | Equal variances assumed     |
|       | 2     | 31 to 40     | 152 | 4.4382 | 0.68037        |                         |                             |
|       | 3     | 41 to 50     | 217 | 4.5290 | 0.57922        |                         |                             |
|       | 4     | 51 to 60     | 51  | 4.3176 | 0.70787        |                         |                             |
|       | 5     | 61 and above | 4   | 4.4500 | 0.50000        |                         |                             |
| SLE   | 1     | 23 to 30     | 25  | 4.1150 | 0.73768        | 0.047                   | Equal variances not assumed |
|       | 2     | 31 to 40     | 152 | 4.1628 | 0.75207        |                         |                             |
|       | 3     | 41 to 50     | 217 | 4.2869 | 0.68132        |                         |                             |
|       | 4     | 51 to 60     | 51  | 4.2181 | 0.76151        |                         |                             |
|       | 5     | 61 and above | 4   | 4.7813 | 0.27717        |                         |                             |

**Table 4.17.** The ANOVA results in terms of age groups

| Scale | Source of Variance | Sum of Squares | df  | Mean Square | F     | p     | Decision      |
|-------|--------------------|----------------|-----|-------------|-------|-------|---------------|
| EID   | Between Groups     | 1.699          | 4   | 0.425       | 1.326 | 0.259 | No difference |
|       | Within Groups      | 142.191        | 444 | 0.320       |       |       |               |
|       | Total              | 143.889        | 448 |             |       |       |               |
| EAT   | Between Groups     | 2.123          | 4   | 0.531       | 1.335 | 0.256 | No difference |
|       | Within Groups      | 176.499        | 444 | 0.398       |       |       |               |
|       | Total              | 178.622        | 448 |             |       |       |               |
| SLE   | Between Groups     | 2.939          | 4   | 0.735       | 1.431 | 0.223 | No difference |
|       | Within Groups      | 227.961        | 444 | 0.513       |       |       |               |
|       | Total              | 230.900        | 448 |             |       |       |               |

As seen in Table 4.17, teachers' environmental identity ( $F=1.326$ ;  $p=0.259>0.05$ ), environmental attitude ( $F=1.335$ ;  $p=0.256>0.05$ ) and sustainable leadership ( $F=1.431$ ;  $p=0.223>0.05$ ) levels do not show statistically significant differences in terms of age groups.

#### 4.5.2. The Results of ANOVA in Terms of Marital Status

According to descriptive statistics for marital status with respect to environmental identity, environmental attitude and sustainable leadership levels in Table 4.18, it is observed that equal variances not assumed for environmental identity ( $p=0.045<0.05$ ) and environmental attitude ( $p=0.003<0.05$ ) levels whereas equal variances assumed for sustainable leadership levels ( $p=0.148>0.05$ ). Based on these findings, the ANOVA results in terms of marital status was summarized and given in Table 4.19.

**Table 4.18.** Descriptive statistics for marital status

| Scale | Group | Marital Status   | N   | Mean   | Std. Deviation | Levene's Test (p value) | Homogeneity of Variance     |
|-------|-------|------------------|-----|--------|----------------|-------------------------|-----------------------------|
| EID   | 1     | Single           | 46  | 6.4799 | 0.40967        | 0.045                   | Equal variances not assumed |
|       | 2     | Married          | 373 | 6.3997 | 0.58801        |                         |                             |
|       | 3     | Divorced/Widowed | 30  | 6.5744 | 0.48006        |                         |                             |
| EAT   | 1     | Single           | 46  | 4.4478 | 0.71204        | 0.003                   | Equal variances not assumed |
|       | 2     | Married          | 373 | 4.4584 | 0.63763        |                         |                             |
|       | 3     | Divorced/Widowed | 30  | 4.6800 | 0.33052        |                         |                             |
| SLE   | 1     | Single           | 46  | 4.2636 | 0.64076        | 0.148                   | Equal variances assumed     |
|       | 2     | Married          | 373 | 4.2185 | 0.73141        |                         |                             |
|       | 3     | Divorced/Widowed | 30  | 4.3500 | 0.66663        |                         |                             |

As Table 4.19 is examined, it can be seen that teachers' environmental identity ( $F=1.614$ ;  $p=0.200>0.05$ ), environmental attitude ( $F=1.753$ ;  $p=0.174>0.05$ ) and sustainable leadership ( $F=0.515$ ;  $p=0.598>0.05$ ) levels do not show statistically significant differences as to marital status.

**Table 4.19.** The ANOVA results in terms of marital status

| Scale | Source of Variance | Sum of Squares | df  | Mean Square | F     | p     | Decision      |
|-------|--------------------|----------------|-----|-------------|-------|-------|---------------|
| EID   | Between Groups     | 1.034          | 2   | 0.517       | 1.614 | 0.200 | No difference |
|       | Within Groups      | 142.855        | 446 | 0.320       |       |       |               |
|       | Total              | 143.889        | 448 |             |       |       |               |
| EAT   | Between Groups     | 1.393          | 2   | 0.697       | 1.753 | 0.174 | No difference |
|       | Within Groups      | 177.229        | 446 | 0.397       |       |       |               |
|       | Total              | 178.622        | 448 |             |       |       |               |
| SLE   | Between Groups     | 0.532          | 2   | 0.266       | 0.515 | 0.598 | No difference |
|       | Within Groups      | 230.368        | 446 | 0.517       |       |       |               |
|       | Total              | 230.900        | 448 |             |       |       |               |

#### 4.5.3. The Results of ANOVA in Terms of Education Level

As shown in Table 4.20, Levene's test results for education level indicate that equal variances assumed for environmental identity ( $p=0.638>0.05$ ) and sustainable leadership ( $p=0.183>0.05$ ) levels whilst equal variances not assumed for environmental attitude levels ( $p=0.044<0.05$ ) in terms of education level. Following these results, the ANOVA in terms of education level as to environmental identity, environmental attitude and sustainable leadership levels was conducted and obtained results are given in Table 4.21.

**Table 4.20.** Descriptive statistics for education level

| Scale | Group | Education Level   | N   | Mean   | Std. Deviation | Levene's Test (p value) | Homogeneity of Variance     |
|-------|-------|-------------------|-----|--------|----------------|-------------------------|-----------------------------|
| EID   | 1     | Bachelor's Degree | 362 | 6.4103 | 0.57931        | 0.638                   | Equal variances assumed     |
|       | 2     | Master's Degree   | 79  | 6.4674 | 0.51906        |                         |                             |
|       | 3     | PhD               | 8   | 6.3654 | 0.46108        |                         |                             |
| EAT   | 1     | Bachelor's Degree | 362 | 4.4735 | 0.63317        | 0.044                   | Equal variances not assumed |
|       | 2     | Master's Degree   | 79  | 4.4430 | 0.65137        |                         |                             |
|       | 3     | PhD               | 8   | 4.7000 | 0.21381        |                         |                             |
| SLE   | 1     | Bachelor's Degree | 362 | 4.2103 | 0.73037        | 0.183                   | Equal variances assumed     |
|       | 2     | Master's Degree   | 79  | 4.3117 | 0.67667        |                         |                             |
|       | 3     | PhD               | 8   | 4.4219 | 0.48614        |                         |                             |

When Table 4.21 is observed, it can be seen that teachers' environmental identity ( $F=0.365$ ;  $p=0.695>0.05$ ), environmental attitude ( $F=0.605$ ;  $p=0.547>0.05$ ) and sustainable leadership ( $F=0.932$ ;  $p=0.395>0.05$ ) levels do not show statistically significant differences in terms of education level.

**Table 4.21.** The ANOVA results in terms of education level

| Scale | Source of Variance | Sum of Squares | df  | Mean Square | F     | p     | Decision      |
|-------|--------------------|----------------|-----|-------------|-------|-------|---------------|
| EID   | Between Groups     | 0.235          | 2   | 0.117       | 0.365 | 0.695 | No difference |
|       | Within Groups      | 143.654        | 446 | 0.322       |       |       |               |
|       | Total              | 143.889        | 448 |             |       |       |               |
| EAT   | Between Groups     | 0.483          | 2   | 0.241       | 0.605 | 0.547 | No difference |
|       | Within Groups      | 178.139        | 446 | 0.399       |       |       |               |
|       | Total              | 178.622        | 448 |             |       |       |               |
| SLE   | Between Groups     | 0.961          | 2   | 0.480       | 0.932 | 0.395 | No difference |
|       | Within Groups      | 229.939        | 446 | 0.516       |       |       |               |
|       | Total              | 230.900        | 448 |             |       |       |               |

#### 4.5.4. The Results of ANOVA in Terms of Position

According to Table 4.22, it can be observed that equal variances assumed for environmental identity ( $p=0.531>0.05$ ), environmental attitude ( $p=0.146>0.05$ ) and sustainable leadership ( $p=0.393>0.05$ ) levels in terms of position.

Based on these findings, when the results of the ANOVA for position are examined in Table 4.23, it can be seen that teachers' environmental identity ( $F=0.511$ ;  $p=0.600>0.05$ ) and environmental attitude ( $F=2.119$ ;  $p=0.121>0.05$ ) levels do not show statistically significant difference in terms of position, but their sustainable leadership levels ( $F=3.473$ ;  $p=0.032<0.05$ ) show statistically significant differences in terms of position. Because equal variances assumed for sustainable leadership levels, Post Hoc test (Dunnett) was applied to determine which groups show differences in terms of position.

**Table 4.22.** Descriptive statistics for position

| Scale | Group | Position       | N   | Mean   | Std. Deviation | Levene's Test (p value) | Homogeneity of Variance |
|-------|-------|----------------|-----|--------|----------------|-------------------------|-------------------------|
| EID   | 1     | Principal      | 50  | 6.3492 | 0.62767        | 0.531                   | Equal variances assumed |
|       | 2     | Vice Principal | 37  | 6.4636 | 0.59515        |                         |                         |
|       | 3     | Teacher        | 362 | 6.4248 | 0.55577        |                         |                         |
| EAT   | 1     | Principal      | 50  | 4.3000 | 0.73206        | 0.146                   | Equal variances assumed |
|       | 2     | Vice Principal | 37  | 4.4757 | 0.60617        |                         |                         |
|       | 3     | Teacher        | 362 | 4.4956 | 0.61705        |                         |                         |
| SLE   | 1     | Principal      | 50  | 4.3675 | 0.68856        | 0.393                   | Equal variances assumed |
|       | 2     | Vice Principal | 37  | 4.4628 | 0.66853        |                         |                         |
|       | 3     | Teacher        | 362 | 4.1896 | 0.72172        |                         |                         |

**Table 4.23.** The ANOVA results in terms of position

| Scale | Source of Variance | Sum of Squares | df  | Mean Square | F     | p     | Decision                                          |
|-------|--------------------|----------------|-----|-------------|-------|-------|---------------------------------------------------|
| EID   | Between Groups     | 0.329          | 2   | 0.164       | 0.511 | 0.600 | No difference                                     |
|       | Within Groups      | 143.560        | 446 | 0.322       |       |       |                                                   |
|       | Total              | 143.889        | 448 |             |       |       |                                                   |
| EAT   | Between Groups     | 1.681          | 2   | 0.840       | 2.119 | 0.121 | No difference                                     |
|       | Within Groups      | 176.941        | 446 | 0.397       |       |       |                                                   |
|       | Total              | 178.622        | 448 |             |       |       |                                                   |
| SLE   | Between Groups     | 3.541          | 2   | 1.771       | 3.473 | 0.032 | <b>Significant difference (Dunnett) Group 2-3</b> |
|       | Within Groups      | 227.359        | 446 | 0.51        |       |       |                                                   |
|       | Total              | 230.900        | 448 |             |       |       |                                                   |

As Table 4.23 is examined, it can be seen that the results of Dunnett test show that teachers whose positions are vice principal ( $\bar{x}=4.4628$ ) have higher sustainable leadership levels than teachers who do not have any management position ( $\bar{x}=4.1896$ ). This result may be due to the fact that vice principals have more advanced sustainable leadership skills and competencies than teachers. Because vice principals help the management of schools, they have sustainable leadership characteristics more than teachers. Therefore, it can be stated that vice principals' perceptions of sustainable leadership levels higher than teachers.

#### 4.5.5. The Results of ANOVA in Terms of Job Experience

As shown in Table 4.24, while equal variances assumed for environmental identity levels ( $p=0.605>0.05$ ) in terms of job experience, equal variances not assumed for environmental attitude ( $p=0.032<0.05$ ) and sustainable leadership ( $p=0.030<0.05$ ) levels in terms of job experience.

Following the findings of homogeneity of variances, the results of ANOVA in terms of job experience are presented in Table 4.25. According to Table 4.25, it is seen that teachers' environmental identity ( $F=1.044$ ;  $p=0.384>0.05$ ) and environmental attitude ( $F=1.526$ ;  $p=0.194>0.05$ ) levels do not show statistically significant differences in terms of job experience, however, teachers' sustainable leadership levels ( $F=2.836$ ;  $p=0.024<0.05$ ) show statistically significant differences in terms of job experience. Owing to equal variances not assumed for sustainable leadership levels, Post Hoc test (Tamhane's T2) test was applied to determine which groups show differences in terms of job experience.

**Table 4.24.** Descriptive statistics for job experience

| Scale | Group | Job Experience (Year) | N   | Mean   | Std. Deviation | Levene's Test (p value) | Homogeneity of Variance     |
|-------|-------|-----------------------|-----|--------|----------------|-------------------------|-----------------------------|
| EID   | 1     | 1 to 9                | 59  | 6.3598 | 0.53149        | 0.605                   | Equal variances assumed     |
|       | 2     | 10 to 19              | 174 | 6.3744 | 0.58325        |                         |                             |
|       | 3     | 20 to 29              | 190 | 6.4648 | 0.56343        |                         |                             |
|       | 4     | 30 to 39              | 24  | 6.5096 | 0.56107        |                         |                             |
|       | 5     | 40 and above          | 2   | 6.7308 | 0.27196        |                         |                             |
| EAT   | 1     | 1 to 9                | 59  | 4.3322 | 0.71013        | 0.032                   | Equal variances not assumed |
|       | 2     | 10 to 19              | 174 | 4.5414 | 0.58022        |                         |                             |
|       | 3     | 20 to 29              | 190 | 4.4600 | 0.63677        |                         |                             |
|       | 4     | 30 to 39              | 24  | 4.3833 | 0.72211        |                         |                             |
|       | 5     | 40 and above          | 2   | 4.8000 | 0.28284        |                         |                             |
| SLE   | 1     | 1 to 9                | 59  | 3.9979 | 0.73932        | 0.030                   | Equal variances not assumed |
|       | 2     | 10 to 19              | 174 | 4.1947 | 0.74595        |                         |                             |
|       | 3     | 20 to 29              | 190 | 4.3191 | 0.65015        |                         |                             |
|       | 4     | 30 to 39              | 24  | 4.3438 | 0.86387        |                         |                             |
|       | 5     | 40 and above          | 2   | 4.7500 | 0.35355        |                         |                             |

As seen in Table 4.25, the results of Tamhane's T2 test indicate that teachers who have job experience from 20 to 29 years ( $\bar{x}=4.3191$ ) have higher sustainable leadership levels than teachers who have job experience from 1 to 9 years ( $\bar{x}=3.9979$ ). It can be said that increase in job experience has a positive effect on teachers' sustainable leadership levels. This may arise from the fact that sustainable developments are transferred year upon year through sustainable leaders as principals, vice principals and teachers.

**Table 4.25.** The ANOVA results in terms of job experience

| Scale | Source of Variance | Sum of Squares | df  | Mean Square | F     | p     | Decision                                                       |
|-------|--------------------|----------------|-----|-------------|-------|-------|----------------------------------------------------------------|
| EID   | Between Groups     | 1.341          | 4   | 0.335       | 1.044 | 0.384 | No difference                                                  |
|       | Within Groups      | 142.548        | 444 | 0.321       |       |       |                                                                |
|       | Total              | 143.889        | 448 |             |       |       |                                                                |
| EAT   | Between Groups     | 2.422          | 4   | 0.605       | 1.526 | 0.194 | No difference                                                  |
|       | Within Groups      | 176.200        | 444 | 0.397       |       |       |                                                                |
|       | Total              | 178.622        | 448 |             |       |       |                                                                |
| SLE   | Between Groups     | 5.753          | 4   | 1.438       | 2.836 | 0.024 | <b>Significant difference<br/>(Tamhane's T2)<br/>Group 3-1</b> |
|       | Within Groups      | 225.147        | 444 | 0.507       |       |       |                                                                |
|       | Total              | 230.900        | 448 |             |       |       |                                                                |

#### 4.5.6. The Results of ANOVA in Terms of Teaching Level

According to Table 4.26, it can be stated that equal variances assumed for environmental identity ( $p=0.210>0.05$ ), environmental attitude ( $p=0.536>0.05$ ) and sustainable leadership ( $p=0.686>0.05$ ) levels in terms of teachers' teaching level. The results of ANOVA were considered based on homogeneity of variances and are represented in Table 4.27.

**Table 4.26.** Descriptive statistics for teaching level

| Scale | Group | Teaching Level   | N   | Mean   | Std. Deviation | Levene's Test (p value) | Homogeneity of Variance |
|-------|-------|------------------|-----|--------|----------------|-------------------------|-------------------------|
| EID   | 1     | Pre-School       | 48  | 6.4151 | 0.58770        | 0.210                   | Equal variances assumed |
|       | 2     | Primary School   | 177 | 6.4016 | 0.61134        |                         |                         |
|       | 3     | Secondary School | 88  | 6.3479 | 0.54167        |                         |                         |
|       | 4     | High School      | 136 | 6.4910 | 0.51026        |                         |                         |
| EAT   | 1     | Pre-School       | 48  | 4.5083 | 0.68660        | 0.536                   | Equal variances assumed |
|       | 2     | Primary School   | 177 | 4.5198 | 0.61098        |                         |                         |
|       | 3     | Secondary School | 88  | 4.3705 | 0.65287        |                         |                         |
|       | 4     | High School      | 136 | 4.4632 | 0.62240        |                         |                         |
| SLE   | 1     | Pre-School       | 48  | 4.1979 | 0.73016        | 0.686                   | Equal variances assumed |
|       | 2     | Primary School   | 177 | 4.2401 | 0.74411        |                         |                         |
|       | 3     | Secondary School | 88  | 4.1946 | 0.68984        |                         |                         |
|       | 4     | High School      | 136 | 4.2574 | 0.70296        |                         |                         |

**Table 4.27.** The ANOVA results in terms of teaching level

| Scale | Source of Variance | Sum of Squares | df  | Mean Square | F     | p     | Decision      |
|-------|--------------------|----------------|-----|-------------|-------|-------|---------------|
| EID   | Between Groups     | 1.203          | 3   | 0.401       | 1.251 | 0.291 | No difference |
|       | Within Groups      | 142.686        | 445 | 0.321       |       |       |               |
|       | Total              | 143.889        | 448 |             |       |       |               |
| EAT   | Between Groups     | 1.385          | 3   | 0.462       | 1.159 | 0.325 | No difference |
|       | Within Groups      | 177.237        | 445 | 0.398       |       |       |               |
|       | Total              | 178.622        | 448 |             |       |       |               |
| SLE   | Between Groups     | 0.278          | 3   | 0.093       | 0.179 | 0.911 | No difference |
|       | Within Groups      | 230.622        | 445 | 0.518       |       |       |               |
|       | Total              | 230.900        | 448 |             |       |       |               |

As shown in Table 4.27, the results of ANOVA indicate that teachers' environmental identity ( $F=1.251$ ;  $p=0.291>0.05$ ), environmental attitude ( $F=1.159$ ;  $p=0.325>0.05$ ) and sustainable leadership ( $F=0.179$ ;  $p=0.911>0.05$ ) levels do not show statistically significant difference in terms of their teaching level.

#### 4.5.7. The Results of ANOVA in Terms of Branch

Table 4.28 shows that equal variances assumed for teachers' environmental identity ( $p=0.186>0.05$ ), environmental attitude ( $p=0.531>0.05$ ) and sustainable leadership ( $p=0.319>0.05$ ) levels in terms of their branches. Following these findings, the results of ANOVA in terms of branch (Table 4.29) demonstrate that teachers' environmental identity ( $F=0.298$ ;  $p=0.827>0.05$ ), environmental attitude ( $F=0.496$ ;  $p=0.685>0.05$ ) and sustainable leadership ( $F=0.255$ ;  $p=0.858$ ) levels do not show statistically significant difference in terms of their branch.

**Table 4.28.** Descriptive statistics for branch

| Scale | Group | Branch                                  | N   | Mean   | Std. Deviation | Levene's Test (p value) | Homogeneity of Variance |
|-------|-------|-----------------------------------------|-----|--------|----------------|-------------------------|-------------------------|
| EID   | 1     | Pre-School Teacher                      | 49  | 6.4207 | 0.58226        | 0.186                   | Equal variances assumed |
|       | 2     | Primary School Teacher                  | 158 | 6.3875 | 0.62528        |                         |                         |
|       | 3     | Branch Teacher                          | 207 | 6.4363 | 0.52560        |                         |                         |
|       | 4     | Technical and Special Education Teacher | 35  | 6.4637 | 0.51550        |                         |                         |
| EAT   | 1     | Pre-School Teacher                      | 49  | 4.5224 | 0.68413        | 0.531                   | Equal variances assumed |
|       | 2     | Primary School Teacher                  | 158 | 4.5076 | 0.63793        |                         |                         |
|       | 3     | Branch Teacher                          | 207 | 4.4406 | 0.63053        |                         |                         |
|       | 4     | Technical and Special Education Teacher | 35  | 4.4286 | 0.53609        |                         |                         |
| SLE   | 1     | Pre-School Teacher                      | 49  | 4.1658 | 0.74275        | 0.319                   | Equal variances assumed |
|       | 2     | Primary School Teacher                  | 158 | 4.2191 | 0.75459        |                         |                         |
|       | 3     | Branch Teacher                          | 207 | 4.2482 | 0.68149        |                         |                         |
|       | 4     | Technical and Special Education Teacher | 35  | 4.2857 | 0.74667        |                         |                         |

**Table 4.29.** The ANOVA results in terms of branch

| Scale | Source of Variance | Sum of Squares | df  | Mean Square | F     | p     | Decision      |
|-------|--------------------|----------------|-----|-------------|-------|-------|---------------|
| EID   | Between Groups     | 0.288          | 3   | 0.096       | 0.298 | 0.827 | No difference |
|       | Within Groups      | 143.601        | 445 | 0.323       |       |       |               |
|       | Total              | 143.889        | 448 |             |       |       |               |
| EAT   | Between Groups     | 0.595          | 3   | 0.198       | 0.496 | 0.685 | No difference |
|       | Within Groups      | 178.027        | 445 | 0.400       |       |       |               |
|       | Total              | 178.622        | 448 |             |       |       |               |
| SLE   | Between Groups     | 0.396          | 3   | 0.132       | 0.255 | 0.858 | No difference |
|       | Within Groups      | 230.504        | 445 | 0.518       |       |       |               |
|       | Total              | 230.900        | 448 |             |       |       |               |

#### 4.5.8. The Results of ANOVA in Terms of Settlement

According to the results of Levene's test (Table 4.30), it can be said that equal variances assumed for teachers' environmental identity ( $p=0.449>0.05$ ), environmental attitude

( $p=0.167>0.05$ ) and sustainable leadership ( $p=0.413>0.05$ ) levels in terms of their settlement where they lived for the longest time. The results of the ANOVA in terms of settlement (Table 4.31) show that while teachers' environmental identity ( $F=0.829$ ;  $p=0.507>0.05$ ) and environmental attitude ( $F=0.999$ ;  $p=0.408>0.05$ ) levels do not show statistically significant difference in terms of settlement, their sustainable leadership levels ( $F=2.922$ ;  $p=0.021<0.05$ ) show statistically significant differences in terms of settlement. Because equal variances assumed for sustainable leadership in terms of settlement, Post Hoc test (Dunnett) was conducted to determine which groups show differences in terms of settlement. According to the results of Dunnett test, it can be stated that teachers who lived in village for the longest time ( $\bar{x}=4.5714$ ) have higher sustainable leadership levels than teachers who lived in town for the longest time ( $\bar{x}=3.5313$ ).

**Table 4.30.** Descriptive statistics for settlement

| Scale | Group | Settlement   | N   | Mean   | Std. Deviation | Levene's Test (p value) | Homogeneity of Variance |
|-------|-------|--------------|-----|--------|----------------|-------------------------|-------------------------|
| EID   | 1     | Metropolitan | 234 | 6.4152 | 0.58087        | 0.449                   | Equal variances assumed |
|       | 2     | City         | 118 | 6.4452 | 0.54521        |                         |                         |
|       | 3     | District     | 86  | 6.4106 | 0.56374        |                         |                         |
|       | 4     | Town         | 4   | 5.9423 | 0.29709        |                         |                         |
|       | 5     | Village      | 7   | 6.5165 | 0.59867        |                         |                         |
| EAT   | 1     | Metropolitan | 234 | 4.4692 | 0.64522        | 0.167                   | Equal variances assumed |
|       | 2     | City         | 118 | 4.5356 | 0.55831        |                         |                         |
|       | 3     | District     | 86  | 4.4140 | 0.66566        |                         |                         |
|       | 4     | Town         | 4   | 4.6000 | 0.43205        |                         |                         |
|       | 5     | Village      | 7   | 4.1429 | 0.94315        |                         |                         |
| SLE   | 1     | Metropolitan | 234 | 4.2281 | 0.71295        | 0.413                   | Equal variances assumed |
|       | 2     | City         | 118 | 4.3443 | 0.66645        |                         |                         |
|       | 3     | District     | 86  | 4.0930 | 0.77083        |                         |                         |
|       | 4     | Town         | 4   | 3.5313 | 0.54367        |                         |                         |
|       | 5     | Village      | 7   | 4.5714 | 0.72836        |                         |                         |

**Table 4.31.** The ANOVA results in terms of settlement

| Scale | Source of Variance | Sum of Squares | df  | Mean Square | F     | p     | Decision                                |
|-------|--------------------|----------------|-----|-------------|-------|-------|-----------------------------------------|
| EID   | Between Groups     | 1.066          | 4   | 0.267       | 0.829 | 0.507 | No difference                           |
|       | Within Groups      | 142.823        | 444 | 0.322       |       |       |                                         |
|       | Total              | 143.889        | 448 |             |       |       |                                         |
| EAT   | Between Groups     | 1.593          | 4   | 0.398       | 0.999 | 0.408 | No difference                           |
|       | Within Groups      | 177.029        | 444 | 0.399       |       |       |                                         |
|       | Total              | 178.622        | 448 |             |       |       |                                         |
| SLE   | Between Groups     | 5.923          | 4   | 1.481       | 2.922 | 0.021 | <b>Significant difference (Dunnett)</b> |
|       | Within Groups      | 224.977        | 444 | 0.507       |       |       |                                         |
|       | Total              | 230.900        | 448 |             |       |       |                                         |

#### 4.5.9. The Results of ANOVA in Terms of Sensitivity and Interest in the Subject of Environment

Table 4.32 shows that equal variances not assumed for teachers' environmental identity ( $p=0.001<0.05$ ), but equal variances assumed for environmental attitude ( $p=0.126>0.05$ ) and sustainable leadership ( $p=0.911>0.05$ ) levels in terms of teachers' sensitivity and interest in the subject of environment. Based on these findings, the results of the ANOVA were evaluated and shown in Table 4.33.

**Table 4.32.** Descriptive statistics for sensitivity and interest in the subject of environment

| Scale | Group | Answers              | N   | Mean   | Std. Deviation | Levene's Test (p value) | Homogeneity of Variance     |
|-------|-------|----------------------|-----|--------|----------------|-------------------------|-----------------------------|
| EID   | 1     | Yes                  | 411 | 6.4707 | 0.51654        | 0.001                   | Equal variances not assumed |
|       | 2     | No                   | 2   | 6.5769 | 0.27196        |                         |                             |
|       | 3     | Sometimes            | 18  | 5.8034 | 0.83193        |                         |                             |
|       | 4     | Depends on the topic | 18  | 5.8504 | 0.72231        |                         |                             |
| EAT   | 1     | Yes                  | 411 | 4.5182 | 0.59717        | 0.126                   | Equal variances assumed     |
|       | 2     | No                   | 2   | 4.6000 | 0.56569        |                         |                             |
|       | 3     | Sometimes            | 18  | 3.9444 | 0.81977        |                         |                             |
|       | 4     | Depends on the topic | 18  | 3.9333 | 0.74833        |                         |                             |
| SLE   | 1     | Yes                  | 411 | 4.2679 | 0.70900        | 0.911                   | Equal variances assumed     |
|       | 2     | No                   | 2   | 4.3750 | 0.88388        |                         |                             |
|       | 3     | Sometimes            | 18  | 3.8889 | 0.68450        |                         |                             |
|       | 4     | Depends on the topic | 18  | 3.7361 | 0.72494        |                         |                             |

As seen in Table 4.33, teachers' environmental identity ( $F=15.721$ ;  $p=0.000<0.05$ ), environmental attitude ( $F=9.871$ ;  $p=0.000<0.05$ ) and sustainable leadership ( $F=4.718$ ;  $p=0.003<0.05$ ) levels show statistically significant differences in terms of their interest in the subject of environment. In order to determine which groups show differences, Tamhane's T2 test was applied for environmental identity levels (equal variances not assumed), and Dunnett test was applied for environmental attitude and sustainable leadership levels (equal variances assumed). According to the results of Tamhanes' T2 test for environmental identity, it is seen that teachers who are interested in the subject of environment ( $\bar{x}=6.4707$ ) have higher environmental identity levels than teachers who are sometimes interested in the subject of environment ( $\bar{x}=5.8034$ ). It is also seen that teachers who are interested in the subject of environment ( $\bar{x}=6.4707$ ) have higher environmental identity levels than teachers who are interested in the subject of environment depending on the topic ( $\bar{x}=5.8504$ ).

According to the results of Dunnett test for environmental attitude (Table 4.33), it is observed that teachers who are interested in the subject of environment ( $\bar{x}=4.5182$ ) have higher environmental attitude levels than teachers who are sometimes interested in the subject of environment ( $\bar{x}=3.9444$ ). It is also observed that teachers who are interested in the subject of

environment ( $\bar{x}=4.5182$ ) have higher environmental attitude levels than teachers who are interested in the subject of environment depending on the topic ( $\bar{x}=3.9333$ ).

According to the results of Dunnett test for sustainable leadership (Table 4.33), it is seen that teachers who are interested in the subject of environment ( $\bar{x}=4.2679$ ) have higher sustainable leadership levels than teachers who are interested in the subject of environment depending on the topic ( $\bar{x}=3.7361$ ).

**Table 4.33.** The ANOVA results in terms of sensitivity and interest in the subject of environment

| Scale | Source of Variance | Sum of Squares | df  | Mean Square | F      | p     | Decision                                                                             |
|-------|--------------------|----------------|-----|-------------|--------|-------|--------------------------------------------------------------------------------------|
| EID   | Between Groups     | 13.789         | 3   | 4.596       | 15.721 | 0.000 | <b>Significant difference (Tamhane's T2)</b><br><b>Group 1-3</b><br><b>Group 1-4</b> |
|       | Within Groups      | 130.101        | 445 | 0.292       |        |       |                                                                                      |
|       | Total              | 143.889        | 448 |             |        |       |                                                                                      |
| EAT   | Between Groups     | 11.144         | 3   | 3.715       | 9.871  | 0.000 | <b>Significant difference (Dunnett)</b><br><b>Group 1-3</b><br><b>Group 1-4</b>      |
|       | Within Groups      | 167.478        | 445 | 0.376       |        |       |                                                                                      |
|       | Total              | 178.622        | 448 |             |        |       |                                                                                      |
| SLE   | Between Groups     | 7.117          | 3   | 2.372       | 4.718  | 0.003 | <b>Significant difference (Dunnett)</b><br><b>Group 1-4</b>                          |
|       | Within Groups      | 223.783        | 445 | 0.503       |        |       |                                                                                      |
|       | Total              | 230.900        | 448 |             |        |       |                                                                                      |

#### 4.5.10. The Results of ANOVA in Terms of Observation of Environmental Problem

Table 4.34 shows that equal variances not assumed for teachers' environmental identity levels ( $p=0.000<0.05$ ) whereas equal variances assumed for teachers' environmental attitude ( $p=0.273>0.05$ ) and sustainable leadership ( $p=0.094>0.05$ ) levels in terms of their observation of environmental problem.

**Table 4.34.** Descriptive statistics for observation of environmental problem

| Scale | Group | Answers | N   | Mean   | Std. Deviation | Levene's Test (p value) | Homogeneity of Variance     |
|-------|-------|---------|-----|--------|----------------|-------------------------|-----------------------------|
| EID   | 1     | Yes     | 381 | 6.4527 | 0.52087        | 0.000                   | Equal variances not assumed |
|       | 2     | No      | 54  | 6.2094 | 0.74030        |                         |                             |
|       | 3     | No idea | 14  | 6.3297 | 0.82432        |                         |                             |
| EAT   | 1     | Yes     | 381 | 4.4940 | 0.61669        | 0.273                   | Equal variances assumed     |
|       | 2     | No      | 54  | 4.3741 | 0.68078        |                         |                             |
|       | 3     | No idea | 14  | 4.2571 | 0.79393        |                         |                             |
| SLE   | 1     | Yes     | 381 | 4.2549 | 0.70432        | 0.094                   | Equal variances assumed     |
|       | 2     | No      | 54  | 4.0764 | 0.76070        |                         |                             |
|       | 3     | No idea | 14  | 4.2054 | 0.88607        |                         |                             |

The results of ANOVA in terms of teachers' observation of environmental problem (Table 4.35) indicate that teachers' environmental identity levels ( $F=4.612$ ;  $p=0.010<0.05$ ) show statistically significant differences in terms of their observation of environmental problem, however, teachers' environmental attitude ( $F=1.696$ ;  $p=0.185>0.05$ ) and sustainable leadership ( $F=1.475$ ;  $p=0.230>0.05$ ) levels do not show statistically significant difference in terms of their observation of environmental problem.

**Table 4.35.** The ANOVA results in terms of observation of environmental problem

| Scale | Source of Variance | Sum of Squares | df  | Mean Square | F     | p     | Decision                                                       |
|-------|--------------------|----------------|-----|-------------|-------|-------|----------------------------------------------------------------|
| EID   | Between Groups     | 2.915          | 2   | 1.458       | 4.612 | 0.010 | <b>Significant difference<br/>(Tamhane's T2)<br/>Group 1-2</b> |
|       | Within Groups      | 140.974        | 446 | 0.316       |       |       |                                                                |
|       | Total              | 143.889        | 448 |             |       |       |                                                                |
| EAT   | Between Groups     | 1.348          | 2   | 0.674       | 1.696 | 0.185 | No difference                                                  |
|       | Within Groups      | 177.274        | 446 | 0.397       |       |       |                                                                |
|       | Total              | 178.622        | 448 |             |       |       |                                                                |
| SLE   | Between Groups     | 1.518          | 2   | 0.759       | 1.475 | 0.230 | No difference                                                  |
|       | Within Groups      | 229.382        | 446 | 0.514       |       |       |                                                                |
|       | Total              | 230.900        | 448 |             |       |       |                                                                |

According to the results of Tamhane's T2 test for environmental identity (Table 4.35), it is seen that teachers who observe environmental problem around their living area ( $\bar{x}=6.4527$ ) have higher environmental identity levels than teachers who do not observe environmental problem around their living area ( $\bar{x}=6.2094$ ).

#### 4.5.11. The Results of ANOVA in Terms of Type of Environmental Problem

The results of Levene's test (Table 4.36) show that equal variances not assumed for teachers' environmental identity ( $p=0.001<0.05$ ) and sustainable leadership ( $p=0.035<0.05$ ) levels in terms of type of environmental problem, however, equal variances assumed for teachers' environmental attitude levels ( $p=0.063>0.05$ ).

As examined in Table 4.37, it is seen that teachers' environmental attitude ( $F=1.888$ ;  $p=0.081>0.05$ ) and sustainable leadership ( $F=0.930$ ;  $p=0.473>0.05$ ) levels do not show statistically significant differences in terms of type of environmental problem. However, it is also seen that teachers' environmental identity levels ( $F=2.737$ ;  $p=0.013<0.05$ ) show statistically significant differences in terms of type of environmental problem. The results of Tamhanes' T2 test show that teachers who observe environmental pollution ( $\bar{x}=6.4520$ ) have higher environmental identity levels than teachers who do not observe any environmental

problem ( $\bar{x}=6.2181$ ). Teachers who observe deforestation ( $\bar{x}=6.5609$ ) have higher environmental identity levels than teachers who do not observe any environmental problem ( $\bar{x}=6.2181$ ). Teachers who observe unplanned urbanization and concretion ( $\bar{x}=6.5250$ ) have higher environmental identity levels than teachers who do not observe any environmental problem ( $\bar{x}=6.2181$ ).

**Table 4.36.** Descriptive statistics for type of environmental problem

| Scale | Group | Answers                                                      | N   | Mean   | Std. Deviation | Levene's Test (p value) | Homogeneity of Variance     |
|-------|-------|--------------------------------------------------------------|-----|--------|----------------|-------------------------|-----------------------------|
| EID   | 1     | Environmental Pollution                                      | 234 | 6.4520 | 0.50276        | 0.001                   | Equal variances not assumed |
|       | 2     | Deforestation                                                | 24  | 6.5609 | 0.51150        |                         |                             |
|       | 3     | Unplanned Urbanization and Concretion                        | 57  | 6.5250 | 0.49429        |                         |                             |
|       | 4     | Infrastructure Problem                                       | 8   | 6.5288 | 0.38448        |                         |                             |
|       | 5     | Ineffectiveness of Waste Management and Recycling Activities | 28  | 6.2637 | 0.56543        |                         |                             |
|       | 6     | Lack of Environmental Consciousness                          | 25  | 6.4677 | 0.66799        |                         |                             |
|       | 7     | No answer                                                    | 73  | 6.2181 | 0.74315        |                         |                             |
| EAT   | 1     | Environmental Pollution                                      | 234 | 4.5103 | 0.60667        | 0.063                   | Equal variances assumed     |
|       | 2     | Deforestation                                                | 24  | 4.4417 | 0.57477        |                         |                             |
|       | 3     | Unplanned Urbanization and Concretion                        | 57  | 4.5614 | 0.54699        |                         |                             |
|       | 4     | Infrastructure Problem                                       | 8   | 4.8000 | 0.21381        |                         |                             |
|       | 5     | Ineffectiveness of Waste Management and Recycling Activities | 28  | 4.4500 | 0.74759        |                         |                             |
|       | 6     | Lack of Environmental Consciousness                          | 25  | 4.2080 | 0.77563        |                         |                             |
|       | 7     | No answer                                                    | 73  | 4.3534 | 0.68922        |                         |                             |
| SLE   | 1     | Environmental Pollution                                      | 234 | 4.2612 | 0.66634        | 0.035                   | Equal variances not assumed |
|       | 2     | Deforestation                                                | 24  | 4.2760 | 0.68364        |                         |                             |
|       | 3     | Unplanned Urbanization and Concretion                        | 57  | 4.3092 | 0.70200        |                         |                             |
|       | 4     | Infrastructure Problem                                       | 8   | 3.9219 | 0.95183        |                         |                             |
|       | 5     | Ineffectiveness of Waste Management and Recycling Activities | 28  | 4.2634 | 0.85143        |                         |                             |
|       | 6     | Lack of Environmental Consciousness                          | 25  | 4.2200 | 0.78584        |                         |                             |
|       | 7     | No answer                                                    | 73  | 4.0890 | 0.79481        |                         |                             |

**Table 4.37.** The ANOVA results in terms of type of environmental problem

| Scale | Source of Variance | Sum of Squares | df  | Mean Square | F     | p     | Decision                                                                                                 |
|-------|--------------------|----------------|-----|-------------|-------|-------|----------------------------------------------------------------------------------------------------------|
| EID   | Between Groups     | 5.154          | 6   | 0.859       | 2.737 | 0.013 | <b>Significant difference (Tamhane's T2)</b><br><b>Group 1-7</b><br><b>Group 2-7</b><br><b>Group 3-7</b> |
|       | Within Groups      | 138.735        | 442 | 0.314       |       |       |                                                                                                          |
|       | Total              | 143.889        | 448 |             |       |       |                                                                                                          |
| EAT   | Between Groups     | 4.463          | 6   | 0.744       | 1.888 | 0.081 | No difference                                                                                            |
|       | Within Groups      | 174.159        | 442 | 0.394       |       |       |                                                                                                          |
|       | Total              | 178.622        | 448 |             |       |       |                                                                                                          |
| SLE   | Between Groups     | 2.879          | 6   | 0.480       | 0.930 | 0.473 | No difference                                                                                            |
|       | Within Groups      | 228.021        | 442 | 0.516       |       |       |                                                                                                          |
|       | Total              | 230.900        | 448 |             |       |       |                                                                                                          |

#### 4.5.12. The Results of ANOVA in Terms of Frequency of Attendance to Seminars, Meetings or Congresses Related to Environmental Problems

Table 4.38 shows that equal variances not assumed for teachers' environmental identity levels ( $p=0.010<0.05$ ) whereas equal variances assumed for teachers' environmental attitude ( $p=0.077>0.05$ ) and sustainable leadership ( $p=0.104>0.05$ ) levels in terms of their frequency of attendance to seminars, meetings or congresses related to environmental problems.

Following the findings of Table 4.38, the ANOVA results are shown in Table 4.39.

These results show that teachers' environmental attitude levels ( $F=2.605$ ;  $p=0.051>0.05$ ) do not show statistically significant differences in terms of frequency of attendance to seminars, meetings or congresses related to environmental problems. However, teachers' environmental identity ( $F=5.908$ ,  $p=0.001<0.05$ ) and sustainable leadership ( $F=2.810$ ;  $p=0.039<0.05$ ) levels show statistically significant differences in terms of frequency of attendance to seminars, meetings or congresses related to environmental problems.

**Table 4.38.** Descriptive statistics for frequency of attendance to seminars, meetings or congresses related to environmental problems

| Scale | Group | Answers   | N   | Mean   | Std. Deviation | Levene's Test (p value) | Homogeneity of Variance     |
|-------|-------|-----------|-----|--------|----------------|-------------------------|-----------------------------|
| EID   | 1     | Never     | 108 | 6.3198 | 0.60662        | 0.010                   | Equal variances not assumed |
|       | 2     | Sometimes | 279 | 6.4012 | 0.56885        |                         |                             |
|       | 3     | Often     | 23  | 6.5920 | 0.49279        |                         |                             |
|       | 4     | Always    | 39  | 6.7258 | 0.31211        |                         |                             |
| EAT   | 1     | Never     | 108 | 4.5556 | 0.61770        | 0.077                   | Equal variances assumed     |
|       | 2     | Sometimes | 279 | 4.4143 | 0.65113        |                         |                             |
|       | 3     | Often     | 23  | 4.7130 | 0.36594        |                         |                             |
|       | 4     | Always    | 39  | 4.5128 | 0.60488        |                         |                             |
| SLE   | 1     | Never     | 108 | 4.2014 | 0.78479        | 0.104                   | Equal variances assumed     |
|       | 2     | Sometimes | 279 | 4.1895 | 0.69717        |                         |                             |
|       | 3     | Often     | 23  | 4.4674 | 0.65085        |                         |                             |
|       | 4     | Always    | 39  | 4.4808 | 0.65427        |                         |                             |

According to Table 4.39 and Table 4.38, it can be stated that teachers who always attend to seminars, meetings or congresses related to environmental problems ( $\bar{x}=6.7258$ ) have higher environmental identity levels than teachers who never attend ( $\bar{x}=6.3198$ ). Teachers who always attend to seminars, meetings or congresses related to environmental problems ( $\bar{x}=6.7258$ ) have higher environmental identity levels than teachers who sometimes attend ( $\bar{x}=6.4012$ ). Table 4.39 and 4.38 also show that teachers who always attend to seminars, meetings or congresses related to environmental problems ( $\bar{x}=4.4808$ ) have higher sustainable leadership levels than teachers who sometimes attend ( $\bar{x}=4.1895$ ).

**Table 4.39.** The ANOVA results in terms of frequency of attendance to seminars, meetings or congresses related to environmental problems

| Scale | Source of Variance | Sum of Squares | df  | Mean Square | F     | p     | Decision                                                                     |
|-------|--------------------|----------------|-----|-------------|-------|-------|------------------------------------------------------------------------------|
| EID   | Between Groups     | 5.511          | 3   | 1.837       | 5.908 | 0.001 | <b>Significant difference<br/>(Tamhane's T2)<br/>Group 4-1<br/>Group 4-2</b> |
|       | Within Groups      | 138.378        | 445 | 0.311       |       |       |                                                                              |
|       | Total              | 143.889        | 448 |             |       |       |                                                                              |
| EAT   | Between Groups     | 3.083          | 3   | 1.028       | 2.605 | 0.051 | No difference                                                                |
|       | Within Groups      | 175.539        | 445 | 0.394       |       |       |                                                                              |
|       | Total              | 178.622        | 448 |             |       |       |                                                                              |
| SLE   | Between Groups     | 4.293          | 3   | 1.431       | 2.810 | 0.039 | <b>Significant difference<br/>(Dunnett)<br/>Group 4-2</b>                    |
|       | Within Groups      | 226.607        | 445 | 0.509       |       |       |                                                                              |
|       | Total              | 230.900        | 448 |             |       |       |                                                                              |

#### 4.5.13. The Results of ANOVA in Terms of Sources that Contribute to Knowledge About Environmental Issues

**Table 4.40.** Descriptive statistics for sources that contribute to knowledge about environmental issues

| Scale | Group | Sources                                                              | N   | Mean   | Std. Deviation | Levene's Test<br>(p value) | Homogeneity of<br>Variance |
|-------|-------|----------------------------------------------------------------------|-----|--------|----------------|----------------------------|----------------------------|
| EID   | 1     | Experts                                                              | 17  | 6.4434 | 0.49965        | 0.163                      | Equal variances<br>assumed |
|       | 2     | Scientific Studies                                                   | 30  | 6.4462 | 0.47736        |                            |                            |
|       | 3     | Books and Magazines                                                  | 32  | 6.2788 | 0.46309        |                            |                            |
|       | 4     | Newspapers                                                           | 2   | 6.3462 | 0.48954        |                            |                            |
|       | 5     | TV Programs                                                          | 57  | 6.2645 | 0.70621        |                            |                            |
|       | 6     | Internet                                                             | 119 | 6.3743 | 0.55070        |                            |                            |
|       | 7     | Associations, Foundations or Institutions Related to the Environment | 25  | 6.6031 | 0.40074        |                            |                            |
|       | 8     | All of the above                                                     | 145 | 6.5082 | 0.57502        |                            |                            |
|       | 9     | None of the above                                                    | 5   | 6.5385 | 0.60569        |                            |                            |
|       | 10    | Personal Interest, Faith, Observations and Experiences               | 17  | 6.3982 | 0.58091        |                            |                            |
| EAT   | 1     | Experts                                                              | 17  | 4.2471 | 0.82622        | 0.062                      | Equal variances<br>assumed |
|       | 2     | Scientific Studies                                                   | 30  | 4.4933 | 0.48061        |                            |                            |
|       | 3     | Books and Magazines                                                  | 32  | 4.4375 | 0.62721        |                            |                            |
|       | 4     | Newspapers                                                           | 2   | 4.0000 | 1.41421        |                            |                            |
|       | 5     | TV Programs                                                          | 57  | 4.3719 | 0.66056        |                            |                            |
|       | 6     | Internet                                                             | 119 | 4.4807 | 0.64483        |                            |                            |
|       | 7     | Associations, Foundations or Institutions Related to the Environment | 25  | 4.5360 | 0.43863        |                            |                            |
|       | 8     | All of the above                                                     | 145 | 4.5779 | 0.59072        |                            |                            |
|       | 9     | None of the above                                                    | 5   | 4.2800 | 0.92304        |                            |                            |
|       | 10    | Personal Interest, Faith, Observations and Experiences               | 17  | 4.1176 | 0.75186        |                            |                            |
| SLE   | 1     | Experts                                                              | 17  | 4.2426 | 0.77494        | 0.217                      | Equal variances<br>assumed |
|       | 2     | Scientific Studies                                                   | 30  | 4.4208 | 0.54583        |                            |                            |
|       | 3     | Books and Magazines                                                  | 32  | 4.0977 | 0.72591        |                            |                            |
|       | 4     | Newspapers                                                           | 2   | 4.1875 | 0.79550        |                            |                            |
|       | 5     | TV Programs                                                          | 57  | 4.2281 | 0.63216        |                            |                            |
|       | 6     | Internet                                                             | 119 | 4.1943 | 0.74071        |                            |                            |
|       | 7     | Associations, Foundations or Institutions Related to the Environment | 25  | 4.0750 | 0.80526        |                            |                            |
|       | 8     | All of the above                                                     | 145 | 4.2974 | 0.72049        |                            |                            |
|       | 9     | None of the above                                                    | 5   | 4.0500 | 0.95851        |                            |                            |
|       | 10    | Personal Interest, Faith, Observations and Experiences               | 17  | 4.1471 | 0.83763        |                            |                            |

Table 4.40 shows that equal variances assumed for teachers' environmental identity ( $p=0.163>0.05$ ), environmental attitude ( $p=0.062>0.05$ ) and sustainable leadership ( $p=0.217>0.05$ ) levels in terms of sources that contribute to knowledge about environmental issues.

As shown in Table 4.41, the results of ANOVA indicate that teachers' environmental identity ( $F=1.521$ ;  $p=0.138>0.05$ ), environmental attitude ( $F=1.691$ ;  $p=0.089>0.05$ ) and sustainable leadership ( $F=0.718$ ;  $p=0.693>0.05$ ) levels do not show statistically significant difference in terms of sources that contribute to knowledge about environmental issues.

**Table 4.41.** The ANOVA results in terms of sources that contribute to knowledge about environmental issues

| Scale | Source of Variance | Sum of Squares | df  | Mean Square | F     | p     | Decision      |
|-------|--------------------|----------------|-----|-------------|-------|-------|---------------|
| EID   | Between Groups     | 4.350          | 9   | 0.483       | 1.521 | 0.138 | No difference |
|       | Within Groups      | 139.539        | 439 | 0.318       |       |       |               |
|       | Total              | 143.889        | 448 |             |       |       |               |
| EAT   | Between Groups     | 5.986          | 9   | 0.665       | 1.691 | 0.089 | No difference |
|       | Within Groups      | 172.636        | 439 | 0.393       |       |       |               |
|       | Total              | 178.622        | 448 |             |       |       |               |
| SLE   | Between Groups     | 3.348          | 9   | 0.372       | 0.718 | 0.693 | No difference |
|       | Within Groups      | 227.552        | 439 | 0.518       |       |       |               |
|       | Total              | 230.900        | 448 |             |       |       |               |

#### 4.5.14. The Results of ANOVA in Terms of Frequency of Discussion About Environmental Issues

**Table 4.42.** Descriptive statistics for frequency of discussion about environmental issues

| Scale | Group | Frequency | N   | Mean   | Std. Deviation | Levene's Test (p value) | Homogeneity of Variance     |
|-------|-------|-----------|-----|--------|----------------|-------------------------|-----------------------------|
| EID   | 1     | Always    | 237 | 6.5394 | 0.47071        | 0.001                   | Equal variances not assumed |
|       | 2     | Sometimes | 208 | 6.3007 | 0.61856        |                         |                             |
|       | 3     | Never     | 4   | 5.5000 | 0.94316        |                         |                             |
| EAT   | 1     | Always    | 237 | 4.5460 | 0.58552        | 0.026                   | Equal variances not assumed |
|       | 2     | Sometimes | 208 | 4.3990 | 0.66999        |                         |                             |
|       | 3     | Never     | 4   | 3.9000 | 0.60000        |                         |                             |
| SLE   | 1     | Always    | 237 | 4.3233 | 0.71490        | 0.405                   | Equal variances assumed     |
|       | 2     | Sometimes | 208 | 4.1250 | 0.70293        |                         |                             |
|       | 3     | Never     | 4   | 4.3750 | 1.08972        |                         |                             |

As Table 4.42 is examined, it is seen that equal variances not assumed for teachers' environmental identity ( $p=0.001<0.05$ ) and environmental attitude ( $p=0.026<0.05$ ) levels

whereas equal variances assumed for teachers' sustainable leadership levels ( $p=0.405>0.05$ ) in terms of frequency of discussion about environmental issues.

According to Table 4.43, it can be seen that teachers' environmental identity ( $F=16.170$ ;  $p=0.000<0.05$ ), environmental attitude ( $F=4.735$ ;  $p=0.009<0.05$ ) and sustainable leadership ( $F=4.371$ ;  $p=0.013<0.05$ ) levels show statistically significant differences in terms of frequency of discussion about environmental issues. Tamhanes' T2 test and Dunnett test were conducted to determine which groups show differences according to the results of homogeneity of variances.

When Table 4.43 is examined, it is seen that teachers who always discuss environmental issues with their students or colleagues ( $\bar{x}=6.5394$ ) have higher environmental identity levels than teachers who sometimes discuss these issues ( $\bar{x}=6.3007$ ). It is also seen that teachers who always discuss environmental issues with their students or colleagues ( $\bar{x}=4.5460$ ) have higher environmental attitude levels than teachers who sometimes discuss these issues ( $\bar{x}=4.3990$ ). Lastly, it is observed that teachers who always discuss environmental issues with their students or colleagues ( $\bar{x}=4.3233$ ) have higher sustainable leadership levels than teachers who sometimes discuss these issues ( $\bar{x}=4.1250$ ).

**Table 4.43.** The ANOVA results in terms of frequency of discussion about environmental issues

| Scale | Source of Variance | Sum of Squares | df  | Mean Square | F      | p     | Decision                                                       |
|-------|--------------------|----------------|-----|-------------|--------|-------|----------------------------------------------------------------|
| EID   | Between Groups     | 9.728          | 2   | 4.864       | 16.170 | 0.000 | <b>Significant difference<br/>(Tamhane's T2)<br/>Group 1-2</b> |
|       | Within Groups      | 134.161        | 446 | 0.301       |        |       |                                                                |
|       | Total              | 143.889        | 448 |             |        |       |                                                                |
| EAT   | Between Groups     | 3.714          | 2   | 1.857       | 4.735  | 0.009 | <b>Significant difference<br/>(Tamhane's T2)<br/>Group 1-2</b> |
|       | Within Groups      | 174.909        | 446 | 0.392       |        |       |                                                                |
|       | Total              | 178.622        | 448 |             |        |       |                                                                |
| SLE   | Between Groups     | 4.439          | 2   | 2.220       | 4.371  | 0.013 | <b>Significant difference<br/>(Dunnett)<br/>Group 1-2</b>      |
|       | Within Groups      | 226.461        | 446 | 0.508       |        |       |                                                                |
|       | Total              | 230.900        | 448 |             |        |       |                                                                |

## 5. CONCLUSIONS

This study aims to investigate the mediating role of sustainable leadership on the relationship between teachers' environmental identity and environmental attitude. According to the results based on this purpose, it was confirmed that environmental identity has a positive effect on environmental attitude and sustainable leadership. It was also proven that sustainable leadership has a positive effect on environmental attitude. However, the mediating role of sustainable leadership was not found on the relationship between teachers' environmental identity and environmental attitude. This may be arise from the fact that sustainable leadership includes many perspectives and purposes which are not only related to environment and its development but also diversity and sustainability of education for students. Although it was seen that sustainable leadership affected from environmental identity and affected environmental attitude, it may not have a role to assume partial or full of the relationship between environmental identity and environmental attitude. Since there is no study examining the relationships between these variables on teachers in the relevant literature, the study results of relationship among variables and the mediating role can not be compared with the previous studies.

The study also aims to test whether or not teachers' environmental identity, environmental attitude and sustainable leadership levels show significant difference in terms of demographic characteristics and general statements about the environment. Based on the results for this purpose, the conclusions were obtained as follows:

- Teachers' environmental identity and sustainable leadership levels did not show significant difference in terms of gender. This result can be interpreted as teachers approach the subject with their teacher identities and have common responsibilities towards the school. However, in the related literature Kızılay and Önal (2019) found that female teachers have higher environmental identity levels than male teachers. The statistically significant difference was found between teachers' environmental attitude levels in terms of gender. It was seen that female teachers have higher environmental attitude levels than male teachers. This result shows similarity with the studies in the literature (Artvinli et al., 2019; Larijani & Yeshodhara, 2008; Shobeiri et al., 2006;

Tanık Önal & Büyük, 2018; Thompson Jr & Gasteiger, 1985) but shows discrepancy with the study conducted by Aznar-Díaz et al. (2019).

- With respect to age groups, teachers' environmental identity, environmental attitude and sustainable leadership levels did not show statistically significant difference. It can be stated that age can not affect teachers' identity and attitude related to environment and their sustainable leadership levels because of importance of environment and development for all ages. However, significant difference between teachers' environmental attitude levels in terms of age groups was found by Arik and Yilmaz (2017) in the related literature.
- In terms of marital status, teachers' environmental identity, environmental attitude and sustainable leadership levels did not show significant difference. This result can be explained as marital status did not have effect on these variables.
- It was determined that teachers' environmental identity, environmental attitude and sustainable leadership levels did not show significant difference in terms of education level. This may be due to the fact that most of the teachers have bachelor's degree and they have similar perspectives in terms of their education level.
- While teachers' environmental identity and environmental attitude levels did not show difference in terms of their position in the school, their sustainable leadership levels showed significant difference. It was stated that vice principals have higher sustainable leadership levels than teachers. This conclusion can be identified as position is one of the factor which affects sustainable leadership in a positive way. Because sustainable leadership has characteristics such as transferring knowledge from one leader to another, it can be noted that advancement in position determines strength of sustainable leadership.
- Teachers' environmental identity and environmental attitude levels did not show significant difference in terms of their job experience. However, their sustainable leadership levels showed significant difference between two job experience groups. It was seen that teachers who had 20 to 29 years job experience have higher sustainable

leadership levels than teachers who had 1 to 9 years. Taking into consideration the relationship of skills and competencies of sustainable leadership are related to experiences, this situation can be interpreted as job experience increases, sustainable leadership level increases as well.

- According to teaching level, teachers' environmental identity, environmental attitude and sustainable leadership levels did not show significant difference. This situation can be explained as teachers' perspectives about environmental issues and sustainable development can not be affected from their teaching level from pre-school to high school.
- Although teachers had different specialized fields related to their job, their environmental identity, environmental attitude and sustainable leadership levels did not show significant difference according to pre-school, primary school, branch, technical and special education categories. This result showed that regardless of their specialized fields, teachers can have similar perceptions about their environmental identity, environmental attitude and sustainable leadership levels.
- While settlement did not have effect on teachers' environmental identity and environmental attitude levels, their sustainable leadership levels showed significant difference in terms of where they lived for the longest time. It was identified that teachers who lived in village for the longest time have higher sustainable leadership levels than teachers who lived in town. This may be occurred due to the conditions and quality of urban and rural life. People who live in rural areas have advantage to form an interaction with the environment in comparison to people who live in urban areas. In the literature, the study conducted by Pektaş and Şentürk (2020) showed higher environmental identity levels based on rural areas, but the study done by Qasim (2016) found that higher environmental attitude levels realized on teachers who live in urban areas.
- It was determined that teachers' environmental identity, environmental attitude and sustainable leadership levels show significant difference in terms of their sensitivity and interest in the subject of the environment. Teachers who were sensitive and have

interest in the subject of the environment have higher environmental identity, environmental attitude and sustainable leadership levels than others whose sensitive and interest changes depending on the topic. In this case, it can be supported that sensitivity and interest of teachers have positive effect on their perceptions related to these variables.

- It was confirmed that teachers' environmental attitude and sustainable leadership levels did not show significant difference in terms of their observation of environmental problem and type of environmental problem. However, their environmental identity levels showed significant difference in terms of both their observation and type of environmental problem where they live. It was found that teachers who observed environmental problems which were environmental pollution, deforestation, unplanned urbanization and concretion had higher environmental identity levels than others who did not observe any environmental problem. Because environmental problems such as environmental pollution, deforestation, unplanned urbanization and concretion are the main causes of threats towards the environment, it can be said that these types of problems and people's awareness about this subject have important role on environmental identity.
- As environmental education had a positive effect on teachers' environmental identity and sustainable leadership levels, but did not have any effect on their environmental attitude levels in the study was seen. It was seen that teachers who received an environmental education have higher environmental identity and sustainable leadership levels than others who did not receive this education. Therefore, it was proven that environmental education has a key role on the development of environmental identity and sustainable leadership. Although environmental education has important role on environmental attitude, the contrast result here can be caused from the content of expressions related to environmental attitude.
- While frequency of attendance to seminars, meetings or congresses related to environmental problems had a positive effect on teachers' environmental identity and sustainable leadership levels, but it did not have any effect on their environmental attitude levels. It was observed that teachers who always attend to seminars, meetings

or congresses related to environmental problems had higher environmental identity levels than others who never attend. In addition, it was seen that teachers who always ensure participation had higher sustainable leadership levels than others who sometimes ensure participation. This case can be interpreted that not only attendance to these type of educational meetings related to environmental problems is important but also its frequency is important. Because these type of meetings help teachers to get current information about environmental problems and raise their awareness and problem solving skills towards the environmental problems.

- In terms of membership of an environmental NGOs, teachers' environmental identity and environmental attitude levels showed significant difference, but their sustainable leadership levels did not show significant difference. Teachers who had a member of any environmental NGOs had higher environmental identity and environmental attitude levels than others who did not have membership to these organizations. In this sense, it can be advocated that being member of an environmental NGOs have positive effect on teachers' identity and attitude that are related to the environment.
- When information sources which contribute to teachers' knowledge about environmental issues were tested, it was recognized that the source which is more used by teachers did not have any effect on teachers' environmental identity, environmental attitude and sustainable leadership levels. In other words, it was seen that the sources which are experts, scientific studies, books and magazines, newspapers, TV programs, internet; associations, foundations or institutions related to the environment; personal interest, faith, observations and experiences that contribute to teachers' understanding and knowledge of environmental issues provided almost the same contribution to their environmental knowledge. But in fact, it can be asserted that all these sources contribute to knowledge from different perspectives.
- The frequency of teachers' discussion about environmental issues with their students or colleagues had a positive effect on their environmental identity, environmental attitude and sustainable leadership levels. It was determined that teachers who always discuss environmental issues with their students or colleagues had higher environmental identity, environmental attitude and sustainable leadership levels than

others who never discuss these issues. Therefore, it is possible to say that as frequency of discussion about environmental issues increases, teachers' environmental identity, environmental attitude and sustainable leadership levels increase as well.

- Organization of extracurricular activities by teachers who want to help environmental problems and support their students' academic success affected teachers' environmental identity and sustainable leadership levels positively whereas did not affect their environmental attitude levels. This result can be interpreted as extracurricular activities improve interaction with the environment and skills of sustainable leadership.
- Spectacularly, it was seen that taking part in environmental works such as research, study or project processes had a positive effect on teachers' environmental identity, environmental attitude and sustainable leadership levels. This situation can be explained through the best way by the quote of Benjamin Franklin: "When they tell you, you forget; when they teach you, you remember; when they involve you, you learn."
- It was determined that teachers' environmental identity levels affected positively from their share of experiences with their students or colleagues to raise environmental awareness. Besides, education which teachers received about sustainable leadership only affected their sustainable leadership levels (positively).

In conclusion, the relationships among teachers' environmental identity, environmental attitude and sustainable leadership was found, but the mediating role of sustainable leadership on the relationship between teachers' environmental identity and environmental attitude was not confirmed. According to demographic characteristics, it was seen that gender had an effect on teachers' environmental attitude and it was observed that position, job experience and settlement had effects on teachers' sustainable leadership. However, no significant difference was found in terms of other demographic characteristics (age, marital status, education level, teaching level and branch). Although significant differences were found in terms of general statements about the environment, only three of them affected teachers' environmental identity, environmental attitude and sustainable leadership levels at the same

time which are; (1) taking part in environmental works (research, study or project processes), (2) sensitivity and interest in the subject of the environment and (3) frequency of discussion about environmental issues.



## 6. RECOMMENDATIONS / FUTURE RESEARCH

In order to improve teachers' environmental identity, environmental attitude and sustainable leadership levels, the following suggestions can be take into consideration:

- ✚ In schools; principals, vice principals and teachers should raise awareness about environment and sustainable leadership.
- ✚ Ministry of National Education can provide education, courses or programs to teachers related to the environment and sustainable leadership.
- ✚ Teachers can be member of environmental NGOs and spare time and energy for practices related to protection of the environment.
- ✚ Both principals and teachers may organize extracurricular activities for students and themselves to help protection of the environment and support academic success.
- ✚ Seminars, meetings or congresses about environmental issues can be organized and teachers can be encouraged to take part in works in relation to environment and development.
- ✚ As sustainable leaders, teachers can support diversity and developments both in school culture and environment without giving a harm to the natural resources and environment.
- ✚ Discussion classes can be created to recognize, understand and brainstorm about environmental problems and present solution offers about these problems.

In order to encourage future studies with this subject, the recommendations can be presented as follows:

- ✚ Future research and studies should focus on scale items. Because the number of items in environmental identity and environmental attitude scales is high and the expressions are long, researchers can shorten scale items and decrease their numbers. This will help people to concentrate on and give sincere responses to them.
- ✚ Due to sustainable leadership is related to position and job experience was found in this study, next studies can be focus only on principals and vice principals of schools to see clearly skills of sustainable leadership.
- ✚ Environmental identity, environmental attitude and sustainable leadership can be correlated with different variables such as environmental effectiveness and environmental leadership.

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# APPENDIX

## SURVEY FORM

Dear Respondent,

This survey is designed to provide data for the master's thesis study whose title is **The Mediating Role of Sustainable Leadership on the Relationship Between Teachers' Environmental Identity and Environmental Attitude**. The data obtained will only be used for scientific purposes. Providing the most correct answers to the survey questions will significantly affect the success of the study. Thank you for your interest in our study and for your time to answer the survey.

**Assoc. Prof. Dr. İ. Efe EFEOĞLU**

Adana Alparslan Türkeş Science and Technology University, Faculty of Business

**Yurdanur ÇALIŞKAN**

Adana Alparslan Türkeş Science and Technology University, Faculty of Business

1. Your Gender: ☐ Male ☐ Female

2. Your Age: .....

3. Your Marital Status: ☐ Single ☐ Married ☐ Divorced/Widowed

4. Your Education Level: ☐ Bachelor' Degree ☐ Master's Degree ☐ Phd

5. Your Duty in School: ☐ Principal ☐ Vice Principal ☐ Teacher

6. Your Job Experience: ..... year

7. The level of school that you give education:

☐ Pre-School ☐ Primary School ☐ Secondary School ☐ High School

8. Your Branch:.....

9. The settlement you have lived for the longest time:

☐ Metropolitan ☐ City ☐ District ☐ Town ☐ Village

10. The subject of environment interests me.

☐ Yes ☐ No ☐ Sometimes ☐ Depends on the topic

**11. I am sensitive to environmental issues.**

☐ Yes ☐ No ☐ Sometimes ☐ Depends on the topic

**12. There is an environmental problem where I live in.**

☐ Yes ☐ No ☐ No idea

**13. If your answer to the previous question is yes, what kind of environmental problem do you observe?**

.....

**14. Have you received an environmental education for environmental problems?**

☐ Yes ☐ No

**15. I attend/have attended seminars, meetings or congresses for environmental problems?**

☐ Never ☐ Sometimes ☐ Often ☐ Always

**16. I am a member of any environmental NGOs.**

☐ Yes ☐ No

**17. The source that contributed the most to my understanding and knowledge of environmental issues:**

☐ Experts ☐ Scientific Studies ☐ Books and Magazines ☐ Newspapers ☐ TV Programs ☐ Internet

☐ Associations, Foundations or Institutions related to the environment ☐ All ☐ None ☐  
Other.....

**18. We discuss environmental issues/problems with my students.**

☐ Always ☐ Sometimes ☐ Never

**19. I organize extracurricular activities that can help with environmental problems and support the academic success of my students.**

☐ Yes ☐ No

**20. I am involved in environmental research, study or project processes (preparation, execution or participation).**

☐ Yes ☐ No

**21. Sharing my knowledge, observations, experiences and ideas about environmental issues/problems with my colleagues and/or students; I try to raise awareness about finding solutions to environmental issues.**

☐ Yes ☐ No

**22. I have received an education on sustainable leadership.**

☐ Yes ☐ No

|    | <b>Sustainable Leadership Scale</b>                                                                                     | (1)<br>Strongly<br>disagree | (2)<br>Disagree       | (3)<br>Neither agree<br>Nor disagree | (4)<br>Agree          | (5)<br>Strongly<br>agree |
|----|-------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------|--------------------------------------|-----------------------|--------------------------|
| 1  | I am aware of sustainable leadership.                                                                                   | <input type="radio"/>       | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/>    |
| 2  | Sustainable leadership is a good innovative concept.                                                                    | <input type="radio"/>       | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/>    |
| 3  | I think that effective leadership can bring sustainable culture within our school.                                      | <input type="radio"/>       | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/>    |
| 4  | Nurturing the core competencies can enhance the sustainable culture.                                                    | <input type="radio"/>       | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/>    |
| 5  | Sustainable leadership as a whole supports the environment protection activity and development.                         | <input type="radio"/>       | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/>    |
| 6  | Sustainable leadership is capable of creating sustainable solution.                                                     | <input type="radio"/>       | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/>    |
| 7  | Enhancing the core competencies can inculcate sustainable competitive advantage.                                        | <input type="radio"/>       | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/>    |
| 8  | The concept of sustainable leadership involves eco-friendly leadership practices and preservation of knowledge capital. | <input type="radio"/>       | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/>    |
| 9  | I think that any added competence is required to be a sustainable leader.                                               | <input type="radio"/>       | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/>    |
| 10 | MNE, encourage school principals to be sustainable leaders.                                                             | <input type="radio"/>       | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/>    |

|    | <b>Environmental Identity Scale</b>                                                                                                                  | (1)<br>Never true     | (2)                   | (3)                   | (4)<br>Neutral        | (5)                   | (6)                   | (7)<br>Always true    |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1  | I spend a lot of time in natural settings (woods, mountains, desert, lakes, ocean).                                                                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 2  | Engaging in environmental behaviors is important to me.                                                                                              | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 3  | I think of myself as a part of nature, not separate from it.                                                                                         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 4  | If I had enough time or money, I would certainly devote some of it to working for environmental causes.                                              | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 5  | When I am upset or stressed, I can feel better by spending some time outdoors “communing with nature.”                                               | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 6  | Living near wildlife is important to me; I would not want to live in a city all the time.                                                            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 7  | I have a lot in common with environmentalists as a group.                                                                                            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 8  | I believe that some of today’s social problems could be cured by returning to a more rural life-style in which people live in harmony with the land. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 9  | I feel that I have a lot in common with other species.                                                                                               | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 10 | I like to garden.                                                                                                                                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 11 | Being a part of the ecosystem is an important part of who I am.                                                                                      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 12 | I feel that I have roots to a particular geographic location that had a significant impact on my development.                                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|    |                                                                                                                             |                       |                       |                       |                       |                       |                       |                       |
|----|-----------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 13 | Behaving responsibly toward the Earth – living a sustainable life-style is part of my moral code.                           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 14 | Learning about the natural world should be an important part of every child's upbringing.                                   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 15 | In general, being part of the natural world is an important part of my self-image.                                          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 16 | I would rather live in a small room or house with a nice view than a bigger room or house with a view of other buildings.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 17 | I really enjoy camping and hiking outdoors.                                                                                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 18 | Sometimes I feel like parts of nature – certain trees, or storms, or mountains – have a personality of their own.           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 19 | I would feel that an important part of my life was missing if I was not able to get out and enjoy nature from time to time. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 20 | I take pride in the fact that I could survive outdoors on my own for a few days.                                            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 21 | I have never seen a work of art that is as beautiful as a work of nature, like a sunset or a mountain range.                | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 22 | My own interests usually seem to coincide with the position advocated by environmentalists.                                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 23 | I feel that I receive spiritual sustenance from experiences with nature.                                                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 24 | I keep mementos from the outdoors in my room, such as shells or rocks or feathers.                                          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|    | <b>Environmental Attitude Scale</b>                                                                                                                              | (1)<br>Strongly disagree | (2)<br>Disagree       | (3)<br>Neither agree<br>Nor disagree | (4)<br>Agree          | (5)<br>Strongly agree |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------|--------------------------------------|-----------------------|-----------------------|
| 1  | Since there are more important projects that should be supported in Turkey, it is unnecessary for the World Bank to support projects of measuring air pollution. | <input type="radio"/>    | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/> |
| 2  | Utilization of natural gas by residential and work places does not contribute to the solution of air pollution problem.                                          | <input type="radio"/>    | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/> |
| 3  | Thinning of the ozone layer threatens every one.                                                                                                                 | <input type="radio"/>    | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/> |
| 4  | Systematic meetings of protest should be organized against ozone-depleting technology products.                                                                  | <input type="radio"/>    | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/> |
| 5  | The news about the contamination of seas, streams and lakes are exaggerated.                                                                                     | <input type="radio"/>    | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/> |
| 6  | Drinking water in large cities is contaminated so as to necessitate the use of filters.                                                                          | <input type="radio"/>    | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/> |
| 7  | Some works dealing with protecting sea turtles seen on some beaches in the South are futile efforts.                                                             | <input type="radio"/>    | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/> |
| 8  | Turkey does not have the problem of desertification.                                                                                                             | <input type="radio"/>    | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/> |
| 9  | People should be encouraged to make small houses near the forest areas of cities in order to meet their needs of clean air.                                      | <input type="radio"/>    | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/> |
| 10 | Air, land and water are inexhaustible sources.                                                                                                                   | <input type="radio"/>    | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/> |
| 11 | Regardless its economic or political status, every country undertaking nuclear testing activities should be protested.                                           | <input type="radio"/>    | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/> |
| 12 | Rapid population growth is a serious environmental problem.                                                                                                      | <input type="radio"/>    | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/> |

|    |                                                                                                                                          |                       |                       |                       |                       |                       |
|----|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 13 | Nutritional deficiency of underdeveloped countries is a result of environmental problems.                                                | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 14 | We should intervene in the behaviors of those individuals who are used to littering and/or spitting on street.                           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 15 | Squatter settlements are not environmental problem.                                                                                      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 16 | The idea of environmental protection was put forward by West countries in order to prevent the development of developing countries.      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 17 | Environmental sensitivity does not prevent the development of the country.                                                               | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 18 | Emergence of environmental groups is the result of belonging needs rather than the mission of protecting environment.                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 19 | Any institution or organization including the United Nations should not interfere countries as they wish to use their natural resources. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 20 | Programs about the environment in newspapers, magazines and television should be increased.                                              | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 21 | The presence of Ministry of Environment is required to solve environmental problems of every country.                                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**Our survey is over. Thank you for your contribution. 😊**