

*Full Length Research Paper*

# **Effect of nature-activities education program on the multiple intelligence level of children in the age group of 8 to 12 years**

**Merve Ceylan**

Department Of Physical Education and Sports, Mugla Sitki Kocman University, Turkey.

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Research population consists of 15 children who attended a 5 week (3 days a week) nature-activities course with the consent of their parents during the summer term of 2016 - 2017 academic year. Participants were selected from children who had never taken part in a nature activity before. Measurement tool of this study was "Development of Self-Assessment Scale in Multiple Intelligence Fields" of which validity and reliability test was conducted in 2001 by Gonca Seber. Since participants aged under 18, official consents of their parents were obtained to initiate the research. Next, scales were applied to all participants face-to-face for twice as before and after the implementation of education program. Obtained data were contrasted with the current multiple intelligence level and distribution of students via analyzing the changes was also measured at the end of 5-week education process. Changes detected in each of the multiple intelligence fields were explored and interpreted. Throughout the education process, 4 instructors supervised the participants. As a result linguistic intelligence ( $t=-5.20$ ;  $p<0.05$ ), visual intelligence ( $t=-8.29$ ;  $p<0.05$ ), mathematical intelligence ( $t=-13.72$ ;  $p<0.05$ ), kinesthetic intelligence ( $t=-6.96$ ;  $p<0.05$ ), social intelligence ( $t=-6.16$ ;  $p<0.05$ ), intrapersonal intelligence ( $t=-11.01$ ;  $p<0.05$ ), naturalistic intelligence ( $t=-8.46$ ;  $p<0.05$ ) and musical intelligence ( $t=-12.08$ ;  $p<0.05$ ) posttest scores of all participants are significantly higher than their pretest scores. A positive and significant relationship was measured between linguistic intelligence and naturalistic intelligence scores ( $r=0.59$ ;  $p<0.01$ ). Yet not any significant relationship existed between linguistic intelligence and other types of intelligence. A negative and significant relationship was measured between the scores of kinesthetic intelligence and social intelligence ( $r=-0.59$ ;  $p<0.01$ ). A negative and significant relationship was identified between the scores of social intelligence and intrapersonal intelligence ( $r=-0.52$ ;  $p<0.01$ ).

**Key words:** Nature-activities, outdoor, multiple intelligence.

## **INTRODUCTION**

Louv (2005), in his book titled as "Last Child in the Woods", directed this question to one of the kids; "Do you

like playing outdoors?" and here is the answer he received from the respondent child; "I prefer playing

E-mail: [merveceylan@ymail.com](mailto:merveceylan@ymail.com).

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indoors because that is where all the power outlets are on”.

In an increasingly modernized society, accessing electronic devices and valuing them as inseparable parts of everyday life has gained a rising popularity among children. In parallel with the extension of time dedicated to electronic devices, the length of time children could spend outside playing with their peers has almost decreased to zero. Inarguably, this entire change cannot merely be attributed to electronic devices. Global researches highlight that various causes accounting for the decrease in children’s mobility level and engaging in outdoor games are heavy traffic, fewer play grounds and impoverished social contact with neighbors. A myriad of families have witnessed that recently natural habitat shed its former gravity as an independent play and social meeting centers for their kids.

A relevant study indicated that children aged 15 in Norway spent an average of 44 h watching TV when not at school and this length of TV-time was comparatively smaller among girls and teenagers (Samdal et al., 1998)

Louv (2005) and Hendricks (2001) claimed that less contact with the nature (outdoors) and play-time triggered adverse effects on children’s physical and mental development and the distortion in children’s attitudes and conceptions about major ecological relations led to a weaker environmental awareness and commitment for nature. Louv (2005) and Hendricks (2001) also argued that disconnection with the nature, woods and mountains in childhood could result in a higher apathy for the nature and lower empathy for the negative environmental transformation. Studies conducted by Chawla (1998, 2006) underscored that a vast majority of adult environmentalists had spent their childhood days in close connection with the nature and in wild-life habitats. In a study implemented in Norway among 630 teenagers for a period of subsequent 10 years the gravity of recreational outdoor activities between the age group of 13-23 was validated (Kjønniksen et al., 2008). This finding is further supported by the report of Finnish authors Tammelin et al. (2003) having put forth that children who spent longer time outside during adolescence period age were more disposed to spend more time outside than their peers once they reached age twenties.

It is a valid and acknowledged fact that free-time activities in the nature contributed to the physical and mental development of children (Faber Taylor and Kuo, 2006). Natural habitats can assist children in honing skills related to the process of scientific research such making inferences, evaluation and observation. Further to that objects in the nature could stimulate learning new words by rising curiosity. Stone and Faulkner (2014) stated that spending time outdoor enhanced the level of physical activity; thereby lowering inertia and excessive weight gain. Hence, it is evident that connecting the children with nature, with plants, animals and earth in short and integrating open spaces to formal education programs is

quite a valued process for overall development.

Natural environments are immensely critical since they provide a chance to the children to recognize themselves, their surrounding and their own feelings (Ouvry, 2003). This contact improves children’s sense of sharing, self-expression of feelings and autonomous decision-making skills; thereby paving the way for success in life. Nature also offers a learning environment for experiments, findings and research. Free from limits, children enjoy themselves in a healthy environment that can unite autonomous learning with the nature and stimulate all senses. Employing learning materials without teachers’ limitations could help to boost creativity and empathy of preschool children.

In Turkey, there is scarcity of studies dealing with outdoor education among children at preschool age. Alat et al. (2012) implemented a research to identify ideas, attitudes and behaviors of preschool teachers as regards outdoor education. Data were collected from 25 preschool teachers employed in the Ministry of National Education schools. Findings revealed that although teachers maintained a positive attitude towards outdoor education they failed to spare sufficient time to outdoor activities for reasons such as unfavorable physical conditions, inadequate security measures, crowded classes, parents’ concerns and negative reactions out of fear that their children might get sick outside.

Gair (1997) listed six basics of an outdoor education program:

1. Education is implemented outside. It does not have to take place in class environment.
2. Participants directly take place in the said activity.
3. Tangible things are utilized. Activities are implemented via using actual objects and human senses.
4. Instead of memorizing given information, relations between objects or events are explored and explained.
5. Learning by doing and experimenting stimulates multiple senses.
6. Since the environment of an outdoor education program differs from a closed classroom setting children find outdoor activities more interesting and enjoyable.

It is an evident fact that outdoor education program can boost students’ time management and social relations, motivation for success, leadership and emotional control, and help children to grasp scientific concepts more easily and engage in higher number of physical activities (Berberoğlu and Uygur, 2013).

## LITERATURE REVIEWS

In relevant literature, it has been reported that education programs involving outdoor activities at early childhood period developed cognitive, socio-emotional and physical

motor skills, awareness, identifying cause-effect relations, observation skills, creative thinking skills, concentration and imagination of learners. Studies have been reached that different sports branches provide positive contributions to the development of children's physical, physiological, and intelligence areas, but no research has been found that examines the effects of nature activities on directly intelligence areas. This research was conducted in order to determine the effects of activities performed in nature directly on multiple intelligences.

### Multiple Intelligence Theory

Subsequent to analyzing traditional intelligence approach, neuropsychology and development expert Gardner started to research cognitive capacity of humans in the 70s and 80s. In his research he claimed to have observed inexplicable things that could not be clarified from a psychometric perspective and stated thus: "*Daily studies I implemented among children and adults with brain disorders have immensely affected me about a physical phenomenon on human nature; human beings are blessed with a large number of extensive skills. A person's mastery in one field is not as simple as to predict or to compare with his/her mastery in a different field!*" (Bümen, 2005). This perspective was the originating point of Multiple Intelligence Theory. In 1983, Gardner published the book *Frames of Mind* in which Multiple Intelligence Theory was introduced alongside with seven distinctive universal capacity frames. He initially created a list of seven logical capacity fields namely linguistic, logical-mathematical, visual-spatial, bodily, interpersonal, kinesthetic and intrapersonal, musical intelligence capacity fields. Next, he added the eighth capacity as naturalistic intelligence and stated that existential intelligence domain was still in research process hence was not in the list yet.

In the proposed intelligence approach of multiple intelligence theory the key word is "multiple"; that means intelligence is multidimensional. In addition a person's inborn intelligence can be improved or transformed; that is to say any individual is capable of learning how to be intelligent. Hence, as has been a common point of focus in a number of modern educational institutes today, Multiple Intelligence Theory advocates that a human's intelligence capacity goes way beyond certain linguistic and mathematical skills merely (Saban, 2001).

In the view of Gardner intelligence is;

1. A set of abilities required to solve an actual problem,
2. The ability to generate a product or service valued in one (or more than) culture,
3. The capacity to identify and solve (or create a problem) to produce some new information.

As regards intelligence capacity of human beings

Gardner suggested the ideas below:

- Every human being has the capacity to improve and elevate his/her own intelligence,
- Intelligence can not only change, but it can also be taught to others,
- Intelligence is a multi-dimensional phenomenon that emerges as an effect of the interaction between mental and intellectual system of humans,
- Despite presenting a multidimensional aspect, intelligence is a unified phenomenon in itself,
- Each person can possess all of the many intelligence fields,
- Each person can develop all of the many intelligence fields to a certain extent,
- Different intelligence fields generically function in unity and in coordination,
- There are a number of ways for a human being to be intelligent in any given domain.

Distinctive features of Multiple Intelligence Theory have been listed such;

1. Definition of intelligence is based on intelligence in real life,
2. The theory examines intelligence from a multidimensional perspective,
3. All intelligence types (intelligence fields) can also increase universally,
4. The holistic profile of intelligence is subject to improvement and change,
5. Any given intelligence encompasses subskills or secondary abilities and can be manifested in various forms.
6. Intelligence categories function not in isolation but in coordination and cooperation.

In the processing of intelligences Armstrong (1994) listed environmental factors that caused an advantage or disadvantage as below:

1. *Opportunity to access resources:* Since a child raised in a financially-disadvantaged family has limited/no means to play instruments such as violin or piano, it may be a challenge to develop his/her musical intelligence capacity.
2. *Historical-cultural factors:* In the event that a child's school prioritizes mathematics and science-based curriculum, his/her logical-mathematical intelligence is likely to develop more.
3. *Geographical factors:* A child raised in a village is likely to better develop his/her kinesthetic and naturalistic intelligence compared to a kid living/raised in an apartment.
4. *Family factors:* The family of a child aspiring to be an artist would, in contrast, develop his/her verbal intelligence if they desire the child to be a lawyer in the

future.

5. *Situational factors*: Individuals raised or living in a crowded family would likely have limited time for self-development unless they are innately social people.

In relevant literature, there was no identified study that directly analyzed the effects of nature sports on multiple intelligence. Yet, as we take into account the overall benefits provided by nature sports, it is viable to consider many positive potential effects on multiple intelligence; hence it is assumed that this research is valuable by means of its projected contributions to increased participation to nature sports in addition to intelligence in general.

## METHODS

### Participants

Research population consists of 15 children who attended a 5-week (3 days a week) nature-activities course with the consent of their parents during the summer term of 2016 - 2017 academic year. Participants were selected from children who had never taken part in a nature activity before.

### Procedure

Measurement tool of this study was "Development of Self-Assessment Scale in Multiple Intelligence Fields" of which validity and reliability test was conducted in 2001 by Gonca Seber. Since participants aged under 18, official consents of their parents were obtained to initiate the research. Next, scales were applied to all participants face-to-face for twice as before and after the implementation of education program.

As regards subdimensions of the scale, in her study, Seber listed internal consistency coefficients in the order of; for Linguistic Intelligence: 0.65; for Mathematical Intelligence: 0.64; for Visual Intelligence: 0.61; for Kinesthetic Intelligence: 0.51; for Musical Intelligence: 0.62; for Social Intelligence: 0.67; for Intrapersonal Intelligence: 0.58 and for Naturalistic Intelligence: 0.72.

Responses to the inventory employed in designating multiple intelligence fields consisted of three sections as "yes" "partially" and "no". In this inventory, a total of 64 items containing 8 individual questions for every single intelligence type were stated. In the process of applying the inventory, participants were verbally informed about expected answers. Participants were requested to read all items attentively and select the best option for them. Every "yes" answer was scored as (3), "no" answer as (1) and "partially" answer as (2).

In the inventory, via adding mathematical values of the answers provided to items in each of the intelligence type, overall intelligence type scores of the participants were computed. At the final inventory, maximum score that participants could receive from any given intelligence type was computed as 24 while minimum score as 8. High test score that could be received from each dimension of the inventory referred to this student's strength in this particular intelligence field while lower test score signified that the student was comparatively weaker in this particular intelligence field.

Obtained data were contrasted with the current multiple intelligence level and distribution of students via analyzing the changes was also measured at the end of 5-week education process. Changes detected in each of the multiple intelligence

fields were explored and interpreted. Throughout the education process, 4 instructors supervised the participants.

### Data analysis

In testing the normality between pretest and posttest scores of students' intelligence types, Skewness coefficient was employed. Skewness coefficient is used to test normal distribution of scores obtained from a constant variable and provided that this coefficient stays within the limits of  $\pm 1$ , it is viable to claim that scores did not significantly deviate from normal distribution limits (Büyüköztürk, 2011:40). Since pretest and posttest scores maintained a normal distribution matched t test was used in the comparison of pretest-posttest scores; in gender-based comparison independent two sample t test was used; in the analysis of relationship between intelligence dimension scores Pearson Correlation Analysis was harnessed. Significance level of the analyses was accepted as 0.05.

### Nature activities implemented throughout the 5-Week Education Program

**1<sup>st</sup> Week:** As the first activity all participants were taken to a trekking activity (walk in the nature). While trekking with the group, some information on the natural flora and fauna of the region was conveyed. Nature courses were offered to show students how to make use of materials in nature (using dried tree branches as rods, building a shelter etc.), finding food and water, traces of animal, tracking as well as making different knot forms with ropes, and also instilling orientation skills such as map-reading to plan a fun and correct activity, route planning and basic navigation skills. In the first week, all participants stayed in the tents set by their instructors.

**2<sup>nd</sup> Week:** During the second week, an active course on camping was offered. Via identifying camp sites, important factors to focus on and the way to set up a tent were instructed to participants all of whom were given a chance to set up their own tent. In the ensuing days of the education program, participants were informed about basic camping materials and their use, starting a fire in the woods and accessing food and water resources. In addition, first-aid training was given for any potential injuries and/or sicknesses that could occur while exercising in the wild nature and to take necessary precautions at the interval between the transfer of casualty/patient to a health institute and organization from the site. During the 2<sup>nd</sup> week of education program, each participant spent the night in the tent s/he set up and they collected their own camp materials in the last morning.

**3<sup>rd</sup> Week:** A course on canoes was offered. Initially, related materials were introduced; next rowing techniques, safety and cooperation briefing was shared. As the last activity of third week, building a raft from natural materials was taught. In order to inform about accommodation techniques in the nature, to secure safety and comfort and to instill the necessities and fine tunes of a nature-friendly camping experiment, entire details on camping were communicated to the participants who stayed in their own tents on the 3<sup>rd</sup> week again.

**4<sup>th</sup> Week:** Jungle trekking was practiced and participants were instructed to collect the leaves in the woods. Next, they were asked to classify collected leaves with respect to color, form and size. Following activity demanded participants to work in groups of 3 and by collecting stones, tree branches, plants, seeds, soil and any other natural material they were asked to draw a picture. As the last activity of this week, participants were grouped in teams of 5 and asked to build a shelter from natural materials. On the last day of education program, participants stayed in their shelters at night.

**Table 1.** Distribution of participants with respect to gender.

Groups	N	%
Girl	7	46.7
Boy	8	53.3

**Table 2.** Results of matched t test with respect to pretest and posttest scores that participants received from intelligence types.

Intelligence type	Timing of the Test	N	$\bar{X}$	SS	T	P
Linguistic intelligence	Pretest	15	16.60	3.14	-5.20	0.000
	Posttest	15	19.60	2.20		
Visual intelligence	Pretest	15	17.53	1.13	-8.29	0.000
	Posttest	15	19.93	1.49		
Mathematical intelligence	Pretest	15	13.73	2.15	-13.72	0.000
	Posttest	15	18.13	1.51		
Kinesthetic intelligence	Pretest	15	15.80	2.37	-6.96	0.000
	Posttest	15	19.00	1.36		
Social intelligence	Pretest	15	17.07	2.79	-6.16	0.000
	Posttest	15	19.73	1.83		
Intrapersonal intelligence	Pretest	15	17.53	1.06	-11.01	0.000
	Posttest	15	20.27	1.03		
Naturalistic intelligence	Pretest	15	16.47	1.92	-8.46	0.000
	Posttest	15	20.20	1.70		
Musical intelligence	Pretest	15	17.07	2.46	-12.08	0.000
	Posttest	15	20.73	1.71		

**5<sup>th</sup> Week:** Canoes were built for transportation and an antique city was visited. Alongside the trekking route to the antique city, some information on the history of the region, antique structures, cave walls and images were communicated to students. At break times, participants were asked to share their ideas about the reason "for selecting the region as a settlement location" and their opinions were listened in a friendly atmosphere. On the last day of the program, a farewell party was organized with the participants and instructors and feedbacks of all participants were received on the overall program.

- i) Throughout all 5-weeks, except the 1<sup>st</sup> week, every participant stayed overnight either in their tents or shelters built by themselves.
- ii) Throughout the entire education program all of the essential safety measures were taken, security units were notified about camping site and emergency plans were devised.
- iii) Throughout the entire education program all of the information transfers were performed in the natural environment with the active participation of children.
- iv) In the transfer of education it was foregrounded to perform the entire learning process as if in a game setting.

## FINDINGS

### Demographic and descriptive findings

Table 1 showed that out of a total of 15 children participating in the research, 7 students (46.7%) are girls, while 8 students are boys (53.3%).

Table 2 revealed that Linguistic intelligence ( $t=-5.20$ ;  $p<0.05$ ), visual intelligence ( $t=-8.29$ ;  $p<0.05$ ), mathematical intelligence ( $t=-13.72$ ;  $p<0.05$ ), kinesthetic intelligence ( $t=-6.96$ ;  $p<0.05$ ), social intelligence ( $t=-6.16$ ;  $p<0.05$ ), intrapersonal intelligence ( $t=-11.01$ ;  $p<0.05$ ), naturalistic intelligence ( $t=-8.46$ ;  $p<0.05$ ) and musical intelligence ( $t=-12.08$ ;  $p<0.05$ ) posttest scores of all participants are significantly higher than their pretest scores.

In Table 3, a positive and significant relationship was measured between linguistic intelligence and naturalistic

**Table 3.** Results of correlation analysis between types of intelligence.

Types of intelligence	2	3	4	5	6	7	8
1-Linguistic intelligence	0.19	-0.19	0.08	0.04	0.03	0.59**	-0.02
2-Visual intelligence	1	0.03	0.39	-0.22	0.28	0.14	0.09
3-Mathematical intelligence		1	-0.03	-0.04	0.10	0.00	0.26
4-Kinesthetic intelligence			1	-0.59**	0.30	0.01	-0.44
5-Social intelligence				1	-0.52**	-0.13	0.50
6-Intrapersonal intelligence					1	0.04	0.12
7-Naturalistic intelligence						1	0.08
8-Musical intelligence							1

\*  $p < 0.05$  and \*\*  $p < 0.01$ .

**Table 4.** With respect to gender comparison; results of independent two sample t test of the posttest scores participants received from types of intelligence.

Types of Intelligence	Gender	N	$\bar{X}$	SD	T	P
Linguistic intelligence	Girl	7	18.14	2.34	-3.02	0.010
	Boy	8	20.88	0.99		
Visual intelligence	Girl	7	19.57	1.90	-0.87	0.398
	Boy	8	20.25	1.04		
Mathematical intelligence	Girl	7	18.43	1.72	0.70	0.498
	Boy	8	17.88	1.36		
Kinesthetic intelligence	Girl	7	19.57	1.40	1.60	0.133
	Boy	8	18.50	1.20		
Social intelligence	Girl	7	19.57	2.37	-0.31	0.762
	Boy	8	19.88	1.36		
Intrapersonal intelligence	Girl	7	20.29	0.49	0.06	0.950
	Boy	8	20.25	1.39		
Naturalistic intelligence	Girl	7	20.14	2.04	-0.12	0.908
	Boy	8	20.25	1.49		
Musical intelligence	Girl	7	20.29	1.50	-0.94	0.362
	Boy	8	21.13	1.89		

intelligence scores ( $r=0.59$ ;  $p < 0.01$ ). Yet no significant relationship existed between linguistic intelligence and other types of intelligence. No significant relationship could be detected among the scores obtained from visual intelligence, mathematical intelligence and musical intelligence as well as the scores of other types of intelligence. A negative and significant relationship was measured between the scores of kinesthetic intelligence and social intelligence ( $r=-0.59$ ;  $p < 0.01$ ); whereas a negative and significant relationship was identified

between the scores of social intelligence and intrapersonal intelligence ( $r=-0.52$ ;  $p < 0.01$ ).

From Table 4, it was determined that with respect to gender posttest scores participants received from linguistic intelligence varied significantly ( $t=-3.02$ ;  $p < 0.05$ ). Posttest linguistic intelligence scores of boys ( $20.88 \pm 0.99$ ) were significantly higher than girls' scores ( $18.14 \pm 2.34$ ). It was also manifested that with respect to gender posttest scores participants received from types of visual, mathematical, kinesthetic, social, intrapersonal,

naturalistic and musical intelligence did not significantly differ ( $p>0.05$ ). The next finding is that pretest scores that participants received from types of intelligence did not significantly differ with respect to gender.

## DISCUSSION

In literature review conducted within the context of this study, a list of studies emphasizing the positive contributions of different branches of sport on the development of children's physical, physiological and intelligence capacity have been identified; yet there has been not any detected study analyzing the direct effects of outdoor activities on intelligence fields of kids.

Data collected from pretest and posttest scores of this study reveal there has been a noteworthy improvement in all of the intelligence types. Gardner (1999) also argued that not any performance can simply be explained with the use of one intelligence solely. Children, while harnessing their multi-dimensional intelligence, not only display their stronger intelligence capacity but they can also contribute to the development of other fields of intelligence. One of the most effective principles of multiple intelligence theory is that intelligence is subject to development. Just because students can excel in a specific intelligence field does not necessarily mean that they would not progress in other fields of intelligence. Provided they have received adequate education, a good number of individuals can develop any intelligence field to a certain competency level since these fields of intelligence function in unison.

The biggest objective that Gardner (2004) aimed in introducing Multiple Intelligence Theory was to design "learning societies". This theory advocates that children attracted to lifelong learning and development are inclined to cultivate positive feelings to education from childhood and can operate their mind actively and maximally; they question any received knowledge, criticize, reflect without falling into the trap of biases or stereotypical patterns, and are good at building bridges between their learning and real-life experiences. With the utilization of Multiple Intelligence Theory in academic programs, interpersonal differences are exalted and favorable environments to improve these differences are designed since "The sole mission of education is extolling variety in place of raising uniformed minds."

In his research, Velle (1979) outlined similar findings in support of this study and claimed that a person's lowest and highest limits of intelligence and abilities are genetics; but the extent a person can develop his/her intelligence and abilities within the range of these limits is subject to environmental factors, life experiences and received education.

In this study, a positive relationship was detected between linguistic intelligence and naturalistic intelligence but the relationship was significantly negative between

kinesthetic intelligence and social intelligence as well as social intelligence and intrapersonal intelligence. Naturalistic intelligence (nature, intelligence of the environment and creatures) refers to recognizing all creatures in the nature and researching and reflecting on their creation; linguistic intelligence (reading, writing and speaking capacity) points to abstract and symbolic thinking with words, concept formation and language-related skills. Conducting a research about a wondered topic in the nature would concurrently activate linguistic intelligence. From this aspect it is an expected finding that a positive relationship exists between these two types of intelligence. Intrapersonal intelligence (self, character and personality intelligence) refers to a person's self-assessment of personal feelings, level of emotional reaction, self-evaluation, creating personal goals; social intelligence (humans, relations and adjustment intelligence) is about group work, verbal and nonverbal communication, empathizing with others' feelings, thoughts and behaviors. It is also identified that a negative relationship existed between social intelligence and kinesthetic intelligence (body, movement and balance intelligence); hence it is argued that this negative relationship stemmed from the conflict between a person's autonomous and social aspects. Sarıcaoğlu and Arıkan (2009), in their study titled; "report on intelligence types, students' foreign language skills and select variables" identified that with respect to intelligence types, no significant relationship existed between girls and boys and yet a positive relationship was also determined between gender and linguistic intelligence. The findings of the same research also manifested that a negative but significant relationship existed between kinesthetic-sensory, spatial and personal-intrapersonal intelligence and linguistics intelligence while the relationship between musical intelligence and writing skill is positive and significant.

The findings revealed that with respect to gender, posttest scores participants received from linguistic intelligence type varied significantly and linguistic intelligence scores of boys were measured to be drastically higher than the scores of girl participants. Gardner listed the traits of linguistic intelligence as (reading, writing and speaking capacity); thinking and communicating with words, evaluating complex linguistic meanings, grasping the syntax and semantics of words, poem reading, telling jokes and stories, grammar knowledge, figurative expression, simile, abstract and symbolic thinking, concept formation and writing which refer to complex skills in the production and effective use of language. Fischer-Tietze (2001) underscored that due to the lack of social bonds, a good number of children are deprived of social abilities that can facilitate communal living, linguistic capacity and behavioral forms essential for communication; thereby triggering a diminished level of self-confidence.

Linguistic abilities, cognitive skills including inference,

planning, observation, recognition and making decisions and motor skills including coordination, endurance and balance become better as a result of interactions with nature. In addition, antisocial behaviors decrease and cooperation, solidarity, agreement and conflict solving skills are enhanced. Developmental levels of the children were evaluated in terms of cognitive, linguistic, social-emotional and motor skills, which are required to improve in the Turkish education program. The pre-test and the post-test results for these skills were compared. The children were found to have significantly enhanced cognitive, linguistic, social-emotional and motor skills, considered as target aspects of development in Preschool Education Programme of the Turkish Ministry of Education, after a ten-week outdoor education programme (Yıldırım and Özyılmaz, 2017).

Throughout the implementation of this research, nature activities promoted social communication among all participants and that interaction provided a feasible setting for self-expression and freedom to share personal opinions. This finding suggests that in the high linguistic intelligence scores measured among boys, feeling comfortable in the designated environment might have played a vital role. In a study applied to high-school students, it was revealed that girl students had greater self-confidence in intrapersonal, linguistic and musical intelligence fields whilst boy students perceived themselves more skillful in mathematical, visual and kinesthetic intelligence fields (Snyder, 2000). In a research directed by Çeliköz (2009) it was concluded that girl students were more skilled in linguistic, visual, musical and social intelligence fields while boy students had an elevated capacity in mathematics-logic, kinesthetic and naturalistic intelligence. Çeliköz (2009) explained this diversion with the attributed social gender roles to men/women in Turkey. On the other hand, a number of studies also manifested that no statistically significant difference was present between girls and boys.

As reported herein above, different researchers provided quite dissimilar results in their studies. However, the fact that in this particular study linguistic intelligence posttest scores of boys was above girls is one finding that distinguishes our study from the earlier research reports. Philosopher Schiller (1976) was a huge proponent of playing games as a vital component of human life. Schiller argued that playing games enables human beings to make their highest objectives and ideals real. Other authors defined games as the most essential dynamic of linguistics, literature and game theory (Derrida, 1972; Wilson, 1990). Considering that during this 5-week nature education program all of the knowledge and skill transfer was performed as if in a game, it is reasonable to argue that nature activities and games at most could have a positive effect on the development of boy participants' linguistic intelligence.

Natural environments not only nourish children's physical development, but they are also beneficial for

learners' cognitive development. They improve children's skills for sharing their knowledge, expressing their feelings and making their own decisions without asking for help, which make them more successful in their lives. They also offer learning environments for experiments, discoveries and research. Children learn freely and have fun in a health environment, incorporate nature and stimulate all the senses. They discover themselves and their abilities while playing freely. Ouvry (2003) and Rivkin (2000) emphasized that children's observation skills can be improved by watching changes in the weather, animal behaviors or even the progress of a building a structure that all take place outside. Gleitman and Lieberman (1995) also highlighted that open fields are equipped with various means that can stimulate children's intellectual development, creativity and imagination.

Moore reported that natural environment provoked all senses and outdoor experiences; activating more than one sense assisted in forging cognitive structures essential for uninterrupted mental development and by offering an open site and relevant materials for "design and production" activities for children, the kids' imagination is further stimulated.

Civelek (2016) investigated the effects of outdoor activities on scientific process skills of preschool children in an experimental study as a Master of Science dissertation. The researcher showed positive effects of a ten-week outdoor activities on the children's scientific process skills, which is consistent with the results of the present study.

Taylor et al. (1998) suggested that outdoor sites in the nature promoted creative games and in addition, it elevated the interaction between children and adults. Nature also alleviated attention deficit disorder and the greener the environment the stronger was the positive effect.

Dowdell et al. (2011) showed in their experimental study that nature and natural environments had a positive effect not only on play but also on the social behavior of children. They stated that such environments encouraged children to play imaginary games, helped children to have a positive relationship with both their peers and teachers and provided children with a different learning environment.

Outdoor environments not only increased psychomotor and cognitive development of children but also contributed to raising their socio-emotional skills. Rivkin (2000) pointed that children have the opportunity to meet other people or animals when playing outside and at the same time children are given a chance to co-experience an event with their peers and via these experiences they would most likely compare each other's behaviors (Creasey et al., 1998). Furthermore, they can interact with their peers during outdoor activities, thereby honing their skills of communication and empathy (Hartle, 1994; Richardson, 2007).



Outdoor physical activities are a precondition for the acquisition of skills necessary for life, while creative thinking promotes the development of these skills in the further use of the various life-changing situations (Krauksta et al., 2016).

It is believed that the results obtained from the research will encourage parents and educators to direct them to nature activities in order to contribute to the development of multiple intelligences. The research is also a source for other future research on the topic. For other research on the subject, the following recommendations can be made;

1. This survey was restricted to 15 participants due to the number of items to be used in activities to be carried out in the nature. It may be advisable to include more participants in the next research.
2. Pre-test and post-test were performed in the study. In subsequent studies, these tests may also be tested for permanence.
3. Research has included activities that can be done in the summer. Subsequent surveys may also include winter activities and spread over longer periods.

In the light of research findings suggestions listed below can be rendered to educators and families;

- 1) Meeting children with the nature should be valued as one of the most significant life events for a child.
- 2) The time children spend outside is, by no means, a waste of time; rather it is an invaluable investment for their well-being.
- 3) Nature, is in a sense, the antidote of stress, nature activities should not only be addressed to children but to children and their parents as well.
- 4) Plants and animals should decidedly be integrated to children's lives.

## CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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