RESEARCH PAPER

The study of green intelligence on environmental experiences and environmental citizenship behavior

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HighlightsGraphical Abstract

• The green intelligence education effectshave been assessed on environmental experience, environmental citizenship behavior and relationship with nature of students.
• The population was all 36350 elementary school students in Bojnourd with sample size of 35 in both experimental and control group with usage of questionnaire as a data gathering tool.
• Results showed positive effect of green education training (GET) on environmental experience (EE) and environmental citizenship behavior (ECB) in relation to nature of students.
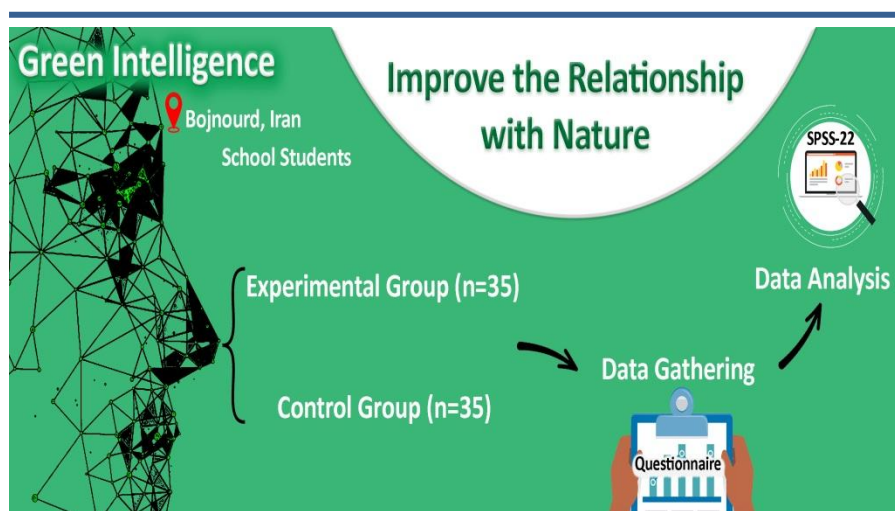
Article Info

Abstract

The purpose of this study was to determine the effect of green intelligence education on environmental experience, environmental citizenship behavior and relationship with nature of students. The research method was a semi-experimental study with pretest-posttest design with two groups of experiment and control. The population of this research was all 36350 elementary school students in Bojnourd, and the sample size was 35students in experimental group and 35 studentsin control group by cluster sampling method. Data gathering tools in this study were questionnaire of Nature Guard Gardner and Moran, (2006), a researcher-made environmental experience questionnaire (2017), HeidariArjlou's Environmental Citizenship Behavior Questionnaire (2015) and Nature Relationship Questionnaire by Nisbet et al., (2009). The validity of all questionnaires has been confirmed by experts. This test was carried out between the sample groups considered based on acceptance and commitment. In order to test the research hypotheses and answer the research questions, the inferential statistics method of Covariance Co-analysis (Equation of Variance) was evaluated by SPSS-22 software. The findings of this study showed that green education training was effective on environmental experience, environmental citizenship behavior and relationship with nature of students. Therefore, training for education of green intelligence will improve the environmental experience, the citizenship behavior of the environment and the relationship with the nature of the students.

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1. Introduction

By increasing thehuman population to 9 billion by 2050, the need for food, clean water, fuel, and space will increase and changes in the environment will continue with changes in the economic and social environment. Scientists' researches suggest according to the trend towards the extinction of plant and animal species in the world, every year, massive amounts of forest area are destroyed. Soil erosion, increasing desert levels, increasing volume of urban and industrial wastewater, increasing consumption of fossil fuels, use of nuclear weapons in battles and military exercises are among environmental threats that threaten the earth and its creatures. Environmental degradation is serious because it has caused humans to have much more depth and breadth in environmental degradation than in the past due to the use of new technologies. In addition, changing the thoughts and cultures of man in terms of success, equalization and the growth of life quality and maximizing profits have doubled this challenge. While Iran has sought to implement development projects within recent 30 years, butit has faced an unprecedented crisis;the population has increased more than doubled, the number of livestock feeding on pastures has tripled, 33% of forest cover has been destroyed, soil erosion has increased 2.5 times and water consumption has doubled (Chuang and Huang, 2018; Soleimanpour et al., 2016). That's why the current era is called the era of environmental crisis. Because it changes lifestyle and consumption. Destruction has become wider and has made it impossible to achieve environmental goals through international obligations. Evidence suggests that we will face environmental crises in the near future, including ozone depletion, acid rain, climate change, droughts, air pollution and radioactivity, flooding, increasing chemical pollution, desertification, water scarcity, etc., which ultimately leads to the spread of poverty and disease among human society. Therefore, these dilemmas reveal the need to incorporate environmental criteria into training. The lack of environmental awareness, according to researchers, is the most critical factor in environmental degradation (Soleimanpour et al., 2016). A great deal of attention has been paid today to environmental education in the global context. Education is one of the most appropriate ways to achieve economic, social, cultural and political development. Educational institutions in their plans should pay close attention to protecting the human environment. To do this, they can strengthen the naturalist intelligence, which is one of Gardner's multiple intelligences.

Gardner and Moran, introduced the theory of multiple intelligences and changed the field of education completely (Gardner and Moran, 2006). They believed that human beings had a lot of intelligence. According to their study, recognizing this by teachers makes them more creative and appropriate with the lessons they face. Nature-oriented intelligence is the eighth intelligence that Gardner introduced. Environmental intelligence is our ability to adapt to our ecological status in nature. Environmental intelligence allows us to apply what we have learned about human-environmental violations and to less harm to our environment. Today, everything is included in the earth (Berkowitz et al., 2005; Kalantari and Asadi, 2010). People who are strong in this intelligence are said to have a high sensitivity to nature and their environment. The ability to grow and cultivate various animal and plant speciesand relaxation in the care and domestication of animals arefeatures of these individuals. They may also be able to detect the weather and other similar activities in their surroundings. In addition, they have a high level of environmental classification. People who are strong in this intelligence will learn better when the subject is gathering information, analysingnature and having a close connection with things that are in the most important and outstanding nature. People with high natural intelligence are interested in having many environmental experiencessuch as direct (forest, sea, etc.) and indirect (park, green space, fields,etc.) (Hopper and Hurry, 2000). Abbaszadeh et al., believed that direct experiences have stronger impact than indirect experiences on behaviour; in other words, indirect experiences such as environmental education in schools compare to the direct experience of these issues, such as observing dead fish in the river leads to a weaker correlation between the attitudes and environmental behaviour of individuals (Abbaszadeh et al., 2017). One of the most important issues that the world is facing today is the behaviour of the environmental citizen. Environmental behaviour is a behaviour that a person encounters in the environment. Today, human

ecological behaviours, as one of the most important and influential factors on the environment, have attracted many researchers and environmentalists.

Unfortunately, Iran has always ranked below the global tables in keeping with the indicators of environmental sustainability, sustainable development and quality of life. The status of our country in the table of indicators of environmental sustainability was 132 among 146 countries in 2005. The above statistics show that Iranian society faces many problems in the phenomenon of the environment. These problems can be explored in two dimensions: structural and operational. In the structural dimension, the government and its actions cause environmental degradation and the main cause of the environmental crisis is government officials'misconceptions about politics, which is beyond the scope of this discussion. But then, the environmental crisis is the environmental behavior of citizens. In this dimension, which focuses on the behavior and interactions of humans with the environment and, in fact, the adverse environmental behavior, with a slight reflection, we realize that unfavorable environmental behaviors in Iranian society have become isolated from the individual and become a social issue. Lack of environmental sensitivity, unhealthy use of energy in homes, use of disposables, use of personal vehicles, use of pesticides, waste disposal in an unsanitary way, garbage disposal on public roads, park Forests and urban-level parks, collecting and disassembling waste for recycling, and many other environmental degrading behaviors all represent undesirable environmental behaviors.

It is socially necessary for a person to always have mutual interaction with his fellows; actions and behaviors that must inevitably be created in a common environment. Hence, every single individual in the community, both individually and collectively, interacts with the environment, but for a long time, People have disrupted the interaction between themselves and nature due to the advancement of technology. This has led to global environmental problems related to natural resources, air pollution and increased population growth, and has put people's lives at a disadvantage (Hungerford and Volk, 1990). Therefore, in order to eliminate environmental problems and protect natural resources, the way people behave in nature should be changed in order to promote and develop favorable environmental behaviors (McBride et al., 2013; Shephard et al., 2014). For decades, social scientists have been exploring the motivation of individuals to engage with environmentally friendly behaviors. In an environmental psychology approach to promoting environmental behaviors, emphasis is on the relationship between human and nature, that is, emotional tendencies, intrinsic and inner love. Relationships with nature are patterns of behavior that are synchronized with the ecosystem and do not disrupt the natural cycle of the ecosystem. The world decomposes into separate parts. In this case, "self" is here and there and everything else "outside" and beyond. It includes the sense of one's importance to other living beings on earth and to understand the relationship of human life with them (Nisbet et al., 2009).

Connection with nature is how people see themselves as part of nature. Unfortunately, most humans tend to look at the world on the basis of a "complete self" and an "another", and, based on such analyze, reinforce the notion that the natural world is simply a mechanical system that humans can exploitorcandestroy it. Researchers emphasize the inner affinity of all life and emphasize the role of human beings as part of the ecosystem of the earth and nature, non-hierarchical, in which all components interact with each other (Scultz, 2000). Regarding the topic of this research, due to its novelty, there has been no consistent and extensive research in the past, whereas naturalistic education can have a tremendous impact on the environmental experience, environmental citizenship behavior, and the connection with nature. An environmental experience could be direct and indirect. Direct experiences involve contact with natural, green spaces, and separation from human environments, and indirect experiences include natural man-made collections such as zoos, Parks and green spaces within cities (Duerden and Witt, 2010). It will ultimately lead to the protection of the environment and natural resources, water, soil and ecosystems, since protecting natural resources and the environment will have a direct and indirect impact on human life, and if these researches are not carried out and consequently the environment is not been protected, human life would be endangered becausethey live in the same environment and environmental crises can lead human todeaths and threaten their well-being. Therefore, the present

research intends to answer the question of whether the education of green intelligence (nature-oriented) influences the environmental experience, the behavior of theenvironment and relationship with the nature of the student. Identifying and cultivating all human intelligence and all its compounds are very important. We humans are all different because we all have different intelligence combinations. Detecting it makes life more suited to life problems. Smart natured children have strong links with the outside world and animals and are keen on caring for animals and plants. According to Gardner and Moran, those with a high level of natural intelligence have a high degree of adaptation to nature, and are usually nurtured, discovered, and learned about the creatures of interest. These people quickly become aware of the slightest changes in their environment (Gardner and Moran, 2006).

In reviewing the sociology of the environment, researchers have come to the fore in the natural environment and experience of the natural environment. They believe that the cause of experience is attachment to the environment and the practical pull of people toward nature. A person who has a sense of communication with nature and the natural world has a wide range of feelings about inhumane organisms, and this feeling can be an important predictor of environmental attitudes and behaviour (Nisbet et al., 2009; Abbaszadeh et al., 2017). The emergence of environmental crises on a daily basis adds to the fact that it cannot continue to be consumed in the world as it used to be, and signs of environmental bottlenecks have become apparent everywhere. Integrating rapid changes in the interior and the world by changing the behaviour of humans in relation to the place of residence and how to live in that location increases the importance of studying environmental citizenship behaviours. The increasing environmental problems and crises in the world, on the one hand, and the long-term implications of environmental issues in human life on the other hand, have increased the importance of discussing the environment and environmental issues over the last half-century (Linuesa-Langreo et al., 2018). As a result of attention to environmental problems and their adverse consequences, humans should find solutions to environmental problems. One of the ways to avoid harming the environment and preventing its destruction is to change the behaviour of humans towards the naturalistic dimension (Hess-Quimbita and Pavel, 1996). In the other study, was contend that linking nature to some of the responsible environmental behaviours is explained (Nisbet et al., 2009). Personal relationships with nature may provide an insight into the environment, while the lack of communication with the natural world will lead to the destruction of our planet. Nisbet et al., noted that despite the apparent attraction, there is a significant variation in the face of nature, and why there are some deep and positive emotions in confronting nature, while others are not (Nisbet et al., 2009). Also, the connection with nature and thus the tendency toward participation in its preservation reduces the alienation of nature and emancipates from the central point of view in dealing with the environment and the tendency to preserve nature and natural resources. This is because in the present day the problems arising from the mechanization of life, it seems that humans live in work, production and even recreation of nature and live in a human-made environment. This remoteness and alienation of nature can make humans indifferent to the environmental issues surrounding them, and reduce their potential in preserving nature and confronting the crisis. So, according to awareness of the need for environmental education, today, as human activities and increasing their effects, the need to educate people who are more responsive to the environment has become more perceptible. Education can have a significant impact on strengthening the environmental culture and attaining the goals of sustainable development. Youth acquaintance with the basic science of the environment at different levels of education can strengthen the spirit of consistency and sense of responsibility in the conservation of natural resources among them. Sustainable development is a widespread approach to social, economic, and environmental issues arising from various human activities that result in the optimal use of all the facilities and capabilities of the environment, thereby pursuing a real and sustainable level of human life. By protecting the environment, sustainable development provides better and more effective results from the operation of natural and artificial environments. The nature-oriented nature education and its impact on environmental experience, environmental behaviour, and long-term environmental relationships will improve eco-tourism, environment and ultimately lead to sustainable development in the country.

When the word "intelligence" comes to our ears, the concept of IQ usually comes to our mind. Intelligence is usually defined as intellectual potential. What we are born with is something that can be measured and the capacity is difficult to change. But in recent years, there have been other views on intelligence. One of these views is the Multiple Intelligence Theory, presented by Howard Gardner, a psychologist at Harvard University. According to this theory, the traditional psychometric views of intelligence are very limited and weak. Gardner presented his theory in 1983 in the booktitled "The Frames of Mind: Theory of Multiple Intelligence" (Gardner, 1983). According to him, all humans have different types of intelligence. In his book, he introduced eight different types of intelligence, and it is likely that the ninth type also exists as "ontological intelligence". According to Gardner's theory, in order to obtain all the capabilities and talents of a person, one should not only examine the coefficient insightfully, but also a variety of other intelligence, such as musical intelligence, intrinsic intelligence, spatial intelligence, and verbal-linguistic intelligence should also be considered. Gardner's theory has been criticized by psychologists and educators. Critics say Gardner's definition of intelligence is very broad and wide, and the eight types of intelligence he describes only represent talents, personality traits, and abilities. Another drawback of Gardner's theory is the lack of practical support for research (Gardner, 1983). Nevertheless, the multiple-choice theory has found a lot of popularity among educators, and many teachers use this theory in choosing their teaching methods. Eight kinds of intelligence that Gardner has defined are:

1. Spatialintelligence: Those with high spatial intelligence are powerful in visualizing things. These people are usually well-positioned and they are often good with directions as well as maps, charts, photos and video.

2. Verbal-linguistic intelligence: Those who have verbal-linguistic intelligence can well use words while writing and speaking. These people often have skills in writing stories, memorizing information and reading.

3. Logical-mathematical intelligence: Those with high logic-mathematical intelligence are strong in reasoning, identifying patterns and logical analysis. These people are interested in thinking about the notion of numbers, relationships, and patterns.

4. Artificial Intelligence-Kinetic: Those who have high organintelligence have strong physical activity. These people are skilled in eye and hand coordination, and they are agile and supportive.

5. Musical Intelligence: Those with high musical intelligence are strong in thinking about patterns, rhythms and sounds. These people enjoy music and are often skilled in playing musical instruments and compositions.

6. Interpersonal intelligence: Those with high interpersonal intelligence are strong in interacting with others and understanding them. They are skilled in measuring the emotions, motives, desires and meanings of those around them.

7. Intra-intelligence: Those with high intrinsic intelligence have a good knowledge of their emotional state, emotions and motives. They enjoy self-examination, daily imagination, slow down their relationship with others, and estimate their abilities.

8. Naturalistic intelligence: Natural intelligence is the last type of intelligence that Gardner has added in his theory to the seven previous types and has been resisted and opposed to the rest. According to Gardner, those with high natural intelligence are more adapted to nature, and are usually interested in breeding, discovering the environment, and learning about creatures. They quickly become aware of the slightest changes in their environment. Characteristics of naturalistic intelligence: Interested in topics such as botany, biology, and pedagogy, Skill for listing information, enjoy buggering, discover nature, walk and play in nature, unwillingness to learn topics that are unrelated to nature (Gardner, 1983).

The results of the other research, entitled "structural modeling of the impact of environmental experiment and environmental attitude on environmental behavior", showed that the environmental experience of Tabrizicitizens was determined to be 83.50 percent of the scale (Abbaszadeh et al., 2017). The average percentage of environmental behaviour is 74.5, which is less than the average environmental perception of 75.83. Structural equation modelling results show that the environmental attitude variable with a coefficient of 0.39 has an impact on environmental behaviour and the environmental experience variable also has an impact on the environmental behaviour with a coefficient of 0.13. The environmental experience variable also affects

the environmental attitude with a 0.3 path coefficient; therefore, the environmental experience, having an impact on the environmental attitude, indirectly affects the environmental behaviour of 0.17. In the other studies, investigated the impact of rural tourism on the promotion of naturalistic-gardener intelligence-high school female students (Whitton and Fletcher, 2014; Reshadat et al., 2019). The results of the findings showed that there was a significant difference between two groups of students that tourism in nature experienced or not, in terms of naturalistic intelligence. The results were in the interest of a group that was more related to the nature and phenomenon of tourism in the rural environment. The results of the other studies, have led to the strengthening of the idea that the communication scale, is a reliable tool for predicting environmental behaviours (Nisbet et al., 2009; Abbaszadeh et al., 2017). The use of this tool in the study and assessment of environmental behaviours of citizens can be effective. Obydenkova and Salahodjaev, considered intelligence, democracy, and international environmental commitment, and the findings showed that intelligence has a statistically significant impact on the adoption of international environmental agreements and countries with an IQ of 10 points (more than the global average 23%) are more likely to sign multilateral environmental agreements (Obydenkova and Salahodjaev, 2016). The findings also revealed that this combination of high levels of environmental intelligence in countries and democracy is likely to lead to international environmental commitments. The results of Geng et al., research, entitled "Nature Communications and Environmental Behaviours", showed that there is a positive relationship with explicit environmental behaviours, while interactions have a positive relationship with spontaneous environmental behaviours (Geng et al., 2015). In addition, explicit and tacit correlations were independent of each other. Consequently, the present study confirms thepositive role of communication with nature in promoting environmental behaviour, and thus suggests encouraging environmental behaviour to strengthen connectivity to nature. The results of the other research, have shown that the environmental citizenship behaviour model has an impact on the role of environmental values and perceived behavioural control in accepting environmental citizenship behaviour (Boiral et al., 2015). The results of Duerden and Witt, showed thattheimpact of direct and indirect experiences in developing attitudes, behaviour, and environmental knowledge has an important roleintheenvironmental knowledge of individuals, but theexperience of living in a direct environment affects the attitude and knowledge alike (Duerden and Witt, 2010). Main hypothesis: Green intelligence training has an impact on environmental experience, environmental citizenship behaviour, and relation to the nature of primary school students.

Sub-hypothesis 1: Green education training has an impact on the environmental experience of primary school students.

Sub-hypothesis 2: Green Intelligence Education has an impact on the environmental citizenship behaviour of primary school students.

Sub-hypothesis 3: Green Intelligence Education has an impact on the relationship betweennatures of elementary students.

Sub-hypothesis 4: Green Intelligence Education has an impact on the nature-oriented nature of primary school students.

2. Materials and Methods

A) Data collection method: Reference books, libraries, websites and published articles were used for research background, research studies and library studies. Standard and researcher-made questionnaires were used to collect research data. This study was a semi-experimental study in whichpretest-posttest design was used and there were both experimental and control groups. The study population was all 36,350 elementary school students in Bojnord city, and the sample size was 35 students in theexperimental group and 35 studentsin the control group. The cluster sampling method was used in this study because this method saves time and cost and preventsthedispersion of selected samples in the city or region. B) Data collection tool: interview questionnaire was provided by observing sampling test of laboratory equipment and databases, computer and

satellite networks, etc.To collect research data, a standard questionnaire was used as follows: 1: Gardner Naturalist Intelligence Standard Questionnaire (1983): This questionnaire has 10 items and it is measured in the form of a 5 point Likert scale which includes strongly agree (scored 1), agree (scored 2), somewhat agree (scored 3), disagree (scored 4), and strongly disagree (scored 5). 2: HeidariArjlou Environmental Citizenship Behavior Questionnaire (2015): This questionnaire has 21 questions and it is measured in the form of a 5 point Likert scalewhich includes strongly agree (scored 1), agree (scored 2), somewhat agree (scored 3), disagree (scored 4), and strongly disagree (scored 5). 3: Nisbet et al., 2009 Nature Relationship Questionnaire (2009): This scale includes three spectral self-perspective feeling scales and world view of nature and physical experience in relation to nature andit has 21 items in Likert scalethat includes strongly agree (scored 1), agree (scored 2), somewhat agree (scored 3), disagree (scored 4), and strongly disagree (scored 5). 4: Information analysis method: Descriptive statistics and inferential statistics were used to analyse the obtained data. The frequency distribution tables and the percentage of the sample group were calculated, and the central tendency and data scattering indicators were presented and the relevant graphs were drawn (Table 1). Kolmogorov-Smirnov testwas used to measure thenormality of data distribution. The inferential statistical method of Levin analysis (equality of variance) was used to test research hypotheses and to answer research questions (Orams, 2002).

3. Results and Discussion

In order to investigate the effect of green intelligence training on environmental experience, environmental behaviour, and environmental communication behaviour among elementary students, the covariance analysis was used in the experimental group compared to the control group. For this purpose, the post-test of each variable in each group (control and case) was performed. An appropriate statistical model was used. The effects of each variable were identified. Descriptive statistics were carefully examined.Before performing the covariance test, the equality of variances was examined by Levene's test to check the absence of any differences between the two groups (Table 2). Then, the covariance test was confirmed for the variables (Paillé et al., 2013).

Table 1. Goodness-of-fit tests for normal distribution invariables.

	Kolmogorov-Smirnov test			Shapiro Wilcoxon Test		
	Test value	Degrees of freedom	The significance level	Test value	Degrees of freedom	The significant level
Environmental Citizenship Behaviour	0.114	70	0.074	0.932	70	0.061
Environmental experience	0.070	70	0.200	0.973	70	0.129
Naturalistic intelligence	0.130	70	0.055	0.969	70	0.078
connection with nature	0.053	70	0.200	0.986	70	0.652

Table 2. Levene's test (homogeneity of variances).

Test	Test value	Degrees of freedom 1	Degrees of freedom 2	Minimum significant level
Environmental citizenship behaviour	0.265	1	68	0.608
Naturalistic intelligence	0.108	1	68	0.744
connection with nature	0.368	1	68	0.546
Environmental experience	0.419	1	68	0.520

Levene's test showed that data varianceswere equal, so a covariance test was possible.

The Kolmogorov-Smirnov and Shapiro Wilcoxon tests showed that data on environmental citizenship behaviour, environmental experience, natural intelligence, and nature-related communication had a normal distribution and therefore parametric tests were done (Table 3).

Hypothesis 1: Environmental intelligence training for elementary students is effective.

Table 3. Mean and standard deviation of the environmental performance of pre-test and post-test by the group**.**

		Group			
		Test		Control	
		Mean	standard deviation	Mean	Standard deviation
Environmental Experience	Pre-test	17.71	5.114	15.71	4.744
	Post-test	21.14	4.571	15.59	5.141
	Post-test after removing pre-test effect	19.80	0.783	15.94	0.783

Table 4. The results of the covariance test for the environmental experience.

Original effect	Degrees of freedom	Average squares	The value of Test F	The minimum significant level	η^2 amount of training effect
Environmental Experience	1	199.472	9.482	0.003	0.124
Group	1	249.650	11.868	0.001	0.150
False	67	21.036			

The covariance test showed that thedifference between themean scores of two groups was significant (F= 11.868, P= 0.001, $\eta^2 = 0.150$) with the elimination of the effect of a pre-test. Therefore, it could be said that green intelligence training had a significant effect on the environmental experience (Table 4). Regarding to the size of the η^2 statistic, we couldsay that effect ofeducation on environmental experience was 15%.

Hypothesis 2: Green education training has an impact on the environmental citizenship behaviour of primary school students (Table 5).

Table 5. Mean and standard deviation of pre-test and post-test environmental citizenship behaviour by a group.

		Group			
		Test		Control	
		Mean	standard deviation	Mean	Standard deviation
Environmental citizenship behaviour	Pre-test	66.43	6.835	66.51	4.668
	Post-test	69.68	5.759	66.97	5.451
	Post-test after removing pre-test effect	69.71	0.774	66.94	0.774

Table 6. The results of the covariance test for environmental citizenship behaviour.

Original effect	Degrees of freedom	Average squares	The value of Test F	The minimum significant level	η^2 amount of training effect
Environmental Experience	1	734.291	35.052	0.000	0.343
Group	1	133.785	6.386	0.014	0.087
False	67	20.949			

The covariance test indicated that the difference between themean scores of the two groups was significant, with the elimination effect of pre-test (F=6.386, P=0.014, $\eta^2 = 0.087$). Therefore, it can be said that green education training had a significant effect on the citizenship behaviour of the environment (Table 6). Given the size of the η^2 statistic, it could be said that the effect of education on the citizenship behaviour of the environment was 8.7%.

Hypothesis 3: Green Intelligence Education has an impact on the relationship with the nature of primary school students (Table 7).

Table 7. Mean and standard deviation of relation with the nature of the pre-test and post-test by the group.

		Group			
		Test		Control	
		Mean	Standard deviation	Mean	Standard deviation
Environmental citizenship behavior	Pre-test	54.14	4.741	52.91	4.973
	Post-test	58.20	8.680	52.46	5.183
	Post-test after removing pre-test effect	57.85	1.128	52.80	1.128

Table 8. The results of the covariance test with nature.

Original effect	Degrees of freedom	Average squares	The value of Test F	The minimum significant level	η^2 amount of training effect
Environmental experience	1	513.333	11.612	0.001	0.148
Group	1	438.280	9.915	0.002	0.129
False	67	44.205			

The covariance test showed that the difference between themean scores ofthetwo groups was significant, with a significant reduction in the effect of pre-test (F = 9.915, P = 0.002, η^2 = 0.129). Therefore, it could be said that education of green intelligence had a significant effect on the connection with nature (Table 8). Given the size of the η^2 statistic, it could be said that the effect of education on the connection with nature was 12.9%.

Hypothesis 4: Green Intelligence Education has an impact on the nature-oriented nature of primary school students.

The covariance test showed that the difference between the mean scores ofthe two groups was significant (P = 0.0005, η^2 = 0.269). Therefore, it could be said that education of green intelligence had a significant effect on natural intelligence. Regarding the size of the η^2 statistic, it could be said that the effect of education on naturalistic intelligence was 26.1% (Tables 9 and 10).

Table 9. Mean and standard deviation of pre-test and post-test naturalistic intelligence by a group.

		Group			
		Test		Control	
		Mean	standard deviation	Mean	Standard deviation
Environmental citizenship behavior	Pre-test	40.34	3.865	41.03	3.222
	Post-test	44.71	4.113	40.61	4.048
	Post-test after removing pre-test effect	44.87	0.639	40.46	0.639

Table 10. The results of the covariance test of naturalistic intelligence.

Original effect	Degrees of freedom	Average squares	The value of Test F	The minimum significant level	η^2 amount of training effect
Environmental experience	1	178.531	12.542	0.001	0.158
Group	1	337.372	23.702	P≤ 0.0005	0.261
False	67	14.234			

In this study, the effect of green intelligence training on environmental experience, environmental citizenship behaviour and connection with nature was investigated. The covariance test was used to test the hypotheses and the results of the research findings were discussed as follows.

Hypothesis 1: Environmental intelligence training is effective for elementary students in Bojnord. According to the results of the test, hypothesis A test showed that there is a significant difference between the mean scores of post-test in two groups with the elimination of the pre-test. According to the results of thehypothesis test, it can be said that green intelligence training has a positive and significant effect on the environmental experience of primary school students. Also, in explaining the result of hypothesis 1, it can be stated that the students of the experimental group obtained better scores in the post-test than the control group, and this increase was becauseof they received aneducation based on green intelligence, and this training has had a positive impact on their environmental experience. In general, it can be concluded that when students in the experimental group have received the necessary training in the development of green intelligence, they have better and more beneficial effects on their environmental experience.

Hypothesis 2: Green education training has an impact on the environmental citizenship behaviour of primary school students. According to the results of the test, hypothesis 2 was shown. The difference between the mean post-test scores of two groups was significant with the elimination of the effect of a pre-test. Therefore, it can be concluded that green education training has a positive and significant effect on the environmental citizenship behaviour of primary school students. It should be noted that the results of this research are consistent with the results of Obydenkova and Salahodjaev (Obydenkova and Salahodjaev, 2016). Explaining the result of hypothesis 2, it can be stated that the students of the experimental group obtained better scores in the post-test than the control group, and this increase was because they received the knowledge based on green intelligence, and this training has had a positive impact on their citizenship behaviour. In general, it can be concluded that when students in the experimental group have received the necessary training in the development of green intelligence, they have better and more beneficial effects on their environmental citizenship behaviour.

Hypothesis 3: Green Intelligence Education has an impact on the relationship with the nature of primary school students.According to the results of the test, hypothesis 3 has been shown. The difference between the mean scores of two groups is significant, with the elimination of the effect of apre-test. Therefore, it can be said that education of green intelligence has a significant effect on the relationship with nature of elementary school students. It can be said that the students of the experimental group obtained better scores in the post-test than the control group, and this increase was due to the fact of they received aneducation based on green intelligence, and these tutorials have a positive impact on the relationship with its nature. In general, it can be concluded that when students in the experimental group have seen the necessary training in green intelligence, they have better and more beneficial effects in relation to nature.

Hypothesis 4: Green intelligence training has an impact on the character of primary school students.

Conclusion

According tofour hypothesis tests,the difference between the mean scores ofthetwo groups is significant with the elimination of the effect of a pre-test. Therefore, it can be said that education of green intelligence has a significant effect on the nature of gradient intelligence in elementary school students. The explanation for the result of hypothesis 4 can also be explained by the fact that the students of the experimental group obtained better scores in the post-test than the control group, and this increase was because they received aneducation based on green intelligence and these tutorials have had a positive impact on their naturalistic intelligence. In general, it can be concluded that when students in the experimental group have received the necessary training in green intelligence, they have a better and more beneficial effect on their naturalistic intelligence. Gardner's Multiple Intelligence Theory suggests that students who have certain limitations in certain categories of intelligence can cause their developed intelligence to pass through these obstacles (Armstrong, 2009; Pereira and Forster, 2015). So that each person can improve his/her level of intelligence until he/she has sufficient training (Gardner, 1983; Yenice and Aktamış, 2010). In general, the results of this study showed that the use of education based on multiple intelligences (natural intelligence) has increased and improved the environmental citizenship behaviours, environmental experience and connection with nature in students. Therefore, the education system should have the ability to foster naturalistic intelligence both within and outside the classroom, in the future, to improve environmental citizenship behaviours, environmental experiences, and good relations with nature. This will help empower the teacher to apply nature-based intelligence training techniques and to create green intelligence activity centres throughout the training process.

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