



Study of Environmental Education on Environmental Knowledge of preschool age Children in Rasht City, Iran

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ABSTRACT: The current study survey Environmental Education on Environmental Knowledge of preschool age Children in Rasht City. The shaping of attitude and values, needed commitments and skills for preserving and protecting environment of individuals begins at an early age. Children as young as pre-school age should be involved. At this age they are very susceptible to the influence of teachers and other people. The current exploratory study examined the effectiveness of a pilot environmental education program, for increasing environmental knowledge and increasing positive environmental perceptions in kindergarten children. The sample of the study is comprised of 104 preschool age children living in Rasht city, Iran. Children were individually interviewed before and after the program to assess changes in their environmental knowledge. Three kindergarten classrooms were randomly assigned to receive the program and three were exposed to story time not related to environmental education. The interview questionnaire was adapted from 'The Children's Attitudes toward the Environment Scale-Preschool Version' (CATES-PV). Results revealed that the environmental education program was effective in increasing environmental knowledge and environmental perceptions for boys in the experimental group. These results from the current study can inform educators about how to integrate developmentally and culturally appropriate environmental education at the kindergarten level and encourages future research on early childhood environmental education and developing better, more psychometrically sound measures.

Keywords: preschool, Environmental education, Environmental Knowledge, Rasht city.

INTRODUCTION

This study survey Environmental Education on Environmental Knowledge of preschool age Children in Rasht city, Iran. Almost all kindergartens of Iran are houses that have converted to kindergarten by the least changes and for arranging the space in them, mural paintings have been considerable used. All educational experts agreed with this point that pictures have kind of potential ability for playing the role in education. Iran's environmental crisis is considered the most severe worldwide (World Bank, 2011). Environmental concerns such as climate change, water shortages, air pollution, and energy crises are currently foci of international attention (United Nations, 2012; World Watch Institute, 2011). A substantial portion of Iran's existing environmental problems stems from a lack of awareness and poor cultural perspectives on the interactions of humans and nature. In fact, it is a kind of cultural problem. Thus, national and international impetus is required to support environment conservation culture within the classes of society.

In this regard, public environmental education is the solution to confront this cultural issue. Indeed, environmental education is a preventive strategy useful in improving environmental knowledge (Meiboudi *et al*, 2012).

The necessity of creating proper relations between humans, nature and the environment requires extensive teaching. Children as young as pre-school age should be involved. At this age they are very susceptible to the influence of teachers and other people (Domka, 2004). Early years of life are regarded as the sensitive period in which human development reaches its optimal stage (Morrison, 2001). The rationale supporting this claim is the recent brain research and research on cognitive development referring critical importance of early years to start learning in life (Nuthbrown, 2006). Environmental education involves recognizing norms and describing concepts to develop skills and attitudes required for understanding relationships among human beings, culture and the environment.

Environmental education also includes policymaking and friendly behavioral rules related to environmental quality (NAAEE, 2004). Environmental education consists of three aspects: "Education about the Environment," "Education in the Environment," and "Education for the Environment" (UNESCO-APEID, 1996).

Environmental education aims to provide opportunities to engage in exploratory learning in order to develop environmental awareness, knowledge, values, attitudes, and skills needed to make informed and responsible choices that protect human health and the environment (North American Association for Environmental Education [NAAEE], 2010); Attitudes toward environmental issues become critically important in the early years of life (Davis, 2009).

In the 2000s, scholars suggested that environmental education was effective in improving academic achievement among students in grades K-12 (Bartosh, Tudor, Ferguson, & Taylor, 2006; Norman, Jennings, & Wahl, 2006). For example, in one of the largest studies, Lieberman, Hoody, and Lieberman (2005) randomly assigned four schools into environmental education groups with four matching control groups. They found that children who participated in environmental education curricula performed better in writing, reading, and math on standardized state tests compared to children in non-environmental education groups.

However, there is little empirical evidence examining early childhood environmental education. For example, there were 39 early childhood environmental education articles from 14 peer-reviewed journals between 1996 and 2007 (Davis, 2009). Most topics did not report whether environmental attitudes are developed in favor of the environment or for the benefit of the people. Erten (2002) investigated that 82% of families warn their children to save energy at home. When the underlying reason was asked to families, they reported their economical concern in terms of expensive bills rather than environmental protection.

The present study aimed to examine the effectiveness of a pilot environmental education program with kindergarten children in an effort to add to the literature base in this disregard field. Almost all kindergartens of Iran are houses that have converted to kindergarten by the least changes (Meiboudi *et al.*, 2011). The study researched young children's knowledge and perceptions related to the environment together with changes in their knowledge and perceptions after participating in the program. Research proposes that children are developing ideas about local and global environmental concerns. Several running lengthwise investigated

changes in children's knowledge about environmental issues such as waste management, deforestation, and climate change (Palmer & Suggate, 2004). Considering the largest sphere of environmental issues relating to environmental protection in the syllabus for children of 5-6 years, Fratzak (1995) researched 320 children in this age group, concluding that about 60% had a high level of knowledge about nature.

These results are coherent with known developmental aware patterns, so there is really no surprise here. However, there is a require for education about environmental issues for young children because they need precise information in understanding how individual actions influence both local and remote environments.

Tests of the effectiveness of environmental education programs shown positive impacts on children's academic skills (Lieberman *et al.*, 2005). A kind of environmental education studies have been guided with children in elementary school to show changes in their environmental knowledge (Larson, Castleberry, & Green, 2010).

The recent study focused on an attempt to enlarge young children's knowledge and promote positive perceptions toward the environment. There is some proof that young children have the capacity to gain specific environmental knowledge from intervention programs. For example, Hadzigersiou *et al.*, (2011) researched the effects of an environmental education program on 159 children ages four and five in eight nursery school classrooms in Greece. Children participated in a circle time that taught about the significant roles played by trees.

The researchers question formally children to estimate knowledge of trees and willingness to participate in tree planting activities before and after the story. Before the tree story interference, children's ideas of trees focused around how trees can be accustomed for making products such as accessories, paper, and food. A week after the interference, children's ideas about trees reflected the interference program. For example, children presented oneself that trees were important because they provide protection from flooding and granted oxygen. Children also enlarged in their readiness to participate in tree planting activities after the interference. Those findings indirectly suggest that environmental education has the possible to infuse proenvironmental perceptions in kindergarten children. The study showed the effectiveness of a short environmental education program on improving young children's knowledge and encouraging environmental behavior.

METHODOLOGY

Present study is a descriptive research and is categorized in applied research group. This study aimed to explore forty 5-6 years old preschool students' environmental knowledge and environmental perceptions with an emphasis on gender differences. Participants were one to one interviewed and interview sheets were regarded as data source of this study. Strength analysis indicated that a total of 64 participants were needed to detect medium effect sizes (Faul *et al.*, 2007). So, forty two participants were to be randomly assigned to the experimental group and 42 to the control group. A total of 98 children participated in the study from six kindergarten programs in Rasht city. The city of Rasht (center of Gilan Province) is located in the northern part of Iran (Fig. 1) with a population of about 520,000 (Technical report, OWRCMR 2007).



Fig. 1. The location of Gilan province and Rasht city in Iran.

The remaining 98 participants ranged in age from 4-6 years, with a mean age of 60 months (SD = 8.51 months) and a mode of 72 months. The summary of the sample is indicated in Table 1.

Chi square analyses were used to check the adequacy of randomization. Groups did not differ significantly in percentages on older in contrast to younger participants. However, there were significantly more boys in experimental group, $\chi^2(1, 98) = 6.2, p = .03, V = .26$. However, variance and sample size ratios met ANOVA

hypothesis of homogeneity. There were no gender differences in pre-program environmental knowledge or violation of assumptions, so gender was not used as a covariate.

Pre-program several of environmental knowledge and perceptions between experimental and control groups were examined using one-way ANOVAs. Environmental knowledge did not differ by group, $F(1, 98) = 0.39, p = .50, \eta^2 = .003$, gender, $F(1, 98) = 0.42, p = .51, \eta^2 = .003$, or age, $F(1, 98) = 0.54, p = .46, \eta^2 = .04$.

Table 1. Case study sample (N = 98).

| Methodology | Experimental | Control |
|-------------|--------------|---------|
| Survey | 48 | 50 |
| Interviews | Boys | 23 |
| | Girls | 19 |

Children in the environmental education group participated in nine 30-minute group activities over a five week cycle. Children in the control group participated in nine 30-minute group activities separate to environmental education so that they had the same amount of exposure to the researcher and interviewers. Children's environmental knowledge was assessed by the same three research assistants previous to and at the conclusion of the program.

This study assessed children's environmental knowledge using a picture interview developed by the author based on the methodology of the Peabody Picture Vocabulary Test (PPVT) (Dunn & Dunn, 1981). The PPVT measures language abilities as an example of vocabulary knowledge with children as young as age two. Studies using the PPVT indicated that kindergarten children can identify correct words by pointing at pictures (Gray, Plante, Vance, & Henrichsen, 1999). Picture interview designs have been used in studies measuring children's environmental knowledge (Palmer, 1995; Palmer & Suggate, 2004). In this study, children were shown a total of six picture cards and asked to identify correct items. Each card included a set of four pictures. For instance, an interviewer showed pictures of animals and ask a child to identify a compost critter. Higher scores indicate more correct answers. The sample of the picture is in Fig. 2.



Fig. 2. One sample of the picture assessed children's environmental knowledge.

RESULTS AND DISCUSSION

Alteration from pre- to post-program scores between the children in the experimental and control groups were analyzed using mixed model ANOVAs. There was no main effect for group, $F(1, 98) = 0.51, p = .70, \eta^2 = .03$, or a group by time interaction, $F(1, 98) = 0.14, p = .91, \eta^2 = .33$. However, there was a main effect for time, $F(1, 98) = 31, p < .001, \eta^2 = .33$. Participants in the experimental and control group both improved their environmental knowledge in an equal manner over time. See table 2 for changes in means and standard deviations in environmental knowledge by group.

Table 2: Means and Standard Deviations in Environmental Knowledge by Group.

| | Pre | | Post | |
|--------------|-----|-----|------|-----|
| | M | SD | M | SD |
| Group | | | | |
| Experimental | 2.0 | 1.3 | 2.8 | 2.1 |
| Control | 1.8 | 1.0 | 2.4 | 1.9 |

Gender and group were accustomed as factors to analyze environmental knowledge in mixed model ANOVAs. There was no main effect for group, $F(1, 98) = 0.81, p = .28, \eta^2 = .05$, or gender, $F(1, 98) = 0.61, p = .62, \eta^2 = .10$. However, there was a main effect for time, $F(1, 98) = 11.01, p < .001, \eta^2 = .10$. This result was qualified with a important time, group, and gender interaction with a medium effect size, $F(1, 98) = 5.0, p = .07, \eta^2 = .09$. Simple effects tests revealed that boys in the experimental group significantly improved their environmental knowledge from pre- to post-program, $F(1, 42) = 6.1, p = .06, \eta^2 = .17$. Environmental knowledge among boys in the control group remained the same. Girls did not improve over time, $F(1, 42) = 1.81, p = .17, \eta^2 = .05$.

This showed indicates that boys in the experimental group improved more in their environmental knowledge than girls of either group or boys in the control. Table 3 shows changes in means and standard deviations in environmental knowledge by gender and group.

Table 3: Means and Standard Deviations in Environmental Knowledge by Group, Gender.

| | Experimental | | | | Control | | | |
|--------|--------------|-----|------|-----|---------|-----|------|-----|
| | Pre | | Post | | Pre | | Post | |
| | M | SD | M | SD | M | SD | M | SD |
| Gender | | | | | | | | |
| Girls | 2.1 | 1.4 | 2.8 | 1.3 | 2.0 | 1.3 | 2.1 | 1.6 |
| Boys | 1.4 | 1.4 | 3.3 | 1.5 | 2.1 | 1.3 | 2.1 | 1.1 |

CONCLUSION

This study show that the shaping of attitude and values, needed commitments and skills for preserving and protecting environment of individuals begins at an early age. Also environmental knowledge increased with significance for boys in the experimental group with a medium effect size, compared to no significant change for girls or boys in the control group towards environmental issues. Forming environmental knowledge and environmental perceptions beginning from early years is a key way of dealing with environmental problems of twenty first century (Biriukova, 2005; Nikolaeva, 2008). The current study was intended to investigate the effectiveness of a short environmental education program on improving young children's knowledge and encouraging environmental behavior.

The results is inconsistent with existing environmental education research with young children such as Gulay *et al.* (2010) and Hadzigeorgiou *et al.* (2011) who found effectiveness of single-topic environmental education programs for experimental boys and girls.

Also, the current study is inconsistent with Larson *et al.* (2010) who evaluated the effectiveness of an experimental five-day multi-topic environmental summer camp program with children age six to thirteen and found that both boys and girls in the environmental program improved their environmental knowledge significantly. In the experimental group almost all of the children had an inclination to save water, electricity and paper. A similar result was obtained by the study of Grodzinska-Jurczak *et al.*, (2006) that aimed at exploring preschooler's environmental attitudes.

Almost all affect size for boys in the environmental education group show a possible gender bias in the environmental program. Due to the fact that the education program used a theme of environmental heroes, this might have drawn towards boys' attention more than girls'. While gender has been planned little in environmental education comprehensive inquiry with kindergarten children, the current result deny Larson *et al.* (2010) who found no gender difference in environmental knowledge among children between six and thirteen who be involved in a five-day environmental education program.

These intermingled results may reflect the differences in participant ages, program content, instructions, and estimation methods. Environmental knowledge and environmental perceptions of preschool children can be enhanced by environmental education programs including both indoor and outdoor activities with a view that environmental attitudes formed during the early years of life have long lasting effects.

The current exploratory evaluation of an experimental environmental education program, Heroes of the Environment in Training, shows its potential to increase environmental knowledge and environmental perceptions among kindergarten children, particularly for boys and perhaps best suited for older children. In the direction of with Larson *et al.* (2010) and Gulay *et al.* (2010), this study contributes to the attempts at developing the appropriateness and effectiveness of environmental education in enlarging environmental knowledge at the kindergarten level. Although today the Islamic Republic of Iran faces Environmental education growth and major successes have been made during recent years; yet, in Iran, on the early childhood education level, there are not structured environmental education programs. However, hands on educational implementations in preschool classrooms need to be enriched and generalized.

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