edam

Educational Sciences: Theory & Practice - Special Issue • Autumn • 2987-2995

www.edam.com.tr/estp

Preschool Children's Ideas on Sustainable Development: How Preschool Children Perceive Three Pillars of Sustainability with the Regard to 7R*

Deniz KAHRİMAN-ÖZTÜRK[a]
Middle East Technical University

Refika OLGAN
Middle East Technical University

Tülin GÜLER
Hacettepe University

Abstract

The purpose of this study is to describe ideas of preschool children about sustainable development. Basic qualitative research was utilized and 36 preschool children enrolled in four different preschools in Ankara were included in the study. Semi-structured interviews were used to obtain data related to ideas of preschool children on three pillars (Environmental, Economical, and Social Cultural) of Education for Sustainable Development and analyzed with inductive content analysis based on 7R's (reduce, reuse, respect, reflect, rethink, and redistribute). Participant children reflected their ideas about reduce, reuse, respect, and recycle; while they did not report any ideas related to reflect, rethink, and redistribute. Moreover, gender did not seem to have an influence on preschool children's ideas about sustainability. It is suggested that sustainable practices should be integrated into early childhood curriculum and supported by preschool teachers, parents and society.

Key Words

Sustainable Development, Education for Sustainable Development, 7R, Early Childhood Education.

Impacts of humankind on the Earth and ecological systems in terms of climate change, resource depletion, and extinction of species revealed us that sustainable development (SD) should be an essential part of human life, not optional (Elliott, 2010). SD is a difficult concept to define. The most popular definition is reported by the Brundtland World Commission on Environment. According to that definition, "…sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 43). In a similar way, SD was defined by World Conservation Union (IUCN) as 'improving the quality of human life while living within the carrying capacity of supporting ecosystems', which highlights enhancing the quality of human life while protecting the Earth's capacity for next generations. Besides these two definitions, focusing on the relationship between the natural environment and humankind, Johannesburg Summit in 2002, added two more pillars in economical and socio-cultural terms into the definition of sustainable development to emphasize social justice and the fight against poverty. As the definition offers, sustainable development includes three integrated pillars: social-cultural, economic and environmental, and these three act together (UNESCO, 2005).

* This study forms part of a research project investigating young children's environmental attitudes. Moreover, this paper was revised after being presented at the International Conference on Global Issues of Early Childhood Education and Children's Rights, Gaziantep, Turkey, 27-29 April 2012.

a **Deniz KAHRİMAN ÖZTÜRK** is a research assistant and Ph.D. candidate in Early Childhood Education Programme at Middle East Technical University, Faculty of Education. Her academic interests are science education in early childhood and early childhood education for sustainable development. Correspondence: Res. Asst. Deniz KAHRİMAN ÖZTÜRK, Middle East Technical University, Faculty of Education, Deparment of Elemantary Education, 06800, Çankaya/ Ankara. E-mail: odeniz@metu.edu.tr Phone: +90 312 2103658. Fax: +90 312 2107984.

Table 1.
Three Pillars of Education for Sustainability Development and 7R's

Pillars	7R's	- Meaning	- Examples
Environmental	Reduce	doing more with less	leaving lights off when unnecessary reducing amount of toys bought
	Reuse	making more use of old things	drawing on both sides of a page making new toys from used articles asking parents to deliver materials to others they don't use any longer
Social-Cultural	Respect	respecting nature and its competences	not disturbing animals not harming environment
	Rethink	valuing other things	challenging the culture of consumption inspiring children to be creative
	Reflect	mentioning cultural differences in the world	talking about how children live in other countries making reflections possible during children meetings
Economical	Recycle	someone else can use it again	sorting out waste making birdhouses from recycled wood
	Redistribute	using resources more equally	exchange projects with poorer schools

Environmental pillar of sustainable development deals with "the drawbacks of depleting natural resources, increased greenhouse gas emissions, overflowing landfills, rising sea levels and polluted waterways focusing on how poorest countries are the worst affected by these challenges in terms of poverty, migration, food and water scarcity, and health care problems" (Siraj-Blatchford, Smith, & Pramling Samuelsson, 2010, p. 14). Additionally, "Social, cultural and political issues regarding participation, emancipation, freedom, security, solidarity, equality and fairness that affect the quality and continuity of people's lives, between individuals and groups within and beyond national borders and between generations" are the issues grouped under the social-cultural pillar of sustainability" (Siraj-Blatchford et al., p. 18). The last component of the sustainability is economical pillar and it deals with concerns about "reducing of the direct environmental burden of producing, using and disposing goods and services; consuming goods and services that contribute positively to the health and well-being of women and children; and increasing the development and adoption of energy and water efficient appliances, public transport and other demand-side measures; production and sale of new goods and services adapted to the global environmental constraints" (Siraj-Blatchford et al., p. 25).

Education is regarded the essential tool to achieve aims of these threefold sustainable development (UNESCO, 1997, p. 16). UNESCO (1997) proposed that education plays a key role in enabling individuals and social groups to act more sustainably. It is now widely recognized that education guides societies to prefer sustainable ways of living. Hence, since the time sustainable development was first defined by UN General Assembly in 1987, the parallel concept of education for sustainable development (ESD) has also emerged. ESD was first described by Chapter 36 of Agenda 21 by United Nations Conference on Environment and Development (UNESCO, 1992). ESD is a concept that is "more than knowledge base related to environment, economy, and society; it also addresses learning skills, perspectives, and values that guide and motivate people to seek sustainable livelihoods" (UNESCO, 2005, p. 18).

7R's were identified by Brundtland Commission Our Common Future (1987) to ease ESD practices in educational settings. OMEP World Assembly also promoted three integrated pillars into more specified dimensions (7R) including; "Reduce, Reuse, Respect, Reflect, Rethink, Recycle and Redistribute" (Duncan, 2011; OMEP, 2010). In Table 1, pillars and dimensions (7R) of sustainable development are described and exemplified.

ESD seeks for alternative ways of living that will create a unique part of Earth's systems (Elliott, 2010). Goals of the UN Decade of Education for Sustainable Development (2005-2014, DESD) (2005) recommended that principles, values, and practices of sustainable development should be integrated into all aspects and levels of education and learning within three pillars. In summary, ESD aims to work with all levels of formal education on

local and global issues and to develop appropriate ideas, attitudes, values and behaviors with respect to sustainability in all levels of formal curriculum starting from the early childhood. Here, the noteworthy question arises: Can ESD with three pillars and 7Rs be applied in early childhood centers?

ESD is an emerging concept in early childhood education and early years has a fundamental role in achieving goals of sustainable development in terms of upbringing necessary attitudes, values and behaviors towards environmental, economical and social pillars of sustainability (Davis, 2009; Siraj-Blatchford, 2009). UNESCO (2008a) and Gothenburg Recommendations (UNESCO, 2008b) acknowledged that lifelong learning about education for sustainability should begin in early childhood (from birth) and should not be postponed until higher grades. In this regard, it is essential to keep in mind that early childhood period plays a key role in creating a mind shift to sustainable development. Another point to highlight is why it is essential to begin ESD in early childhood years. Many studies have been conducted and results highlighted the importance of early brain and cognitive development of young children (Spodek, 1993; Wolfe & Brandt, 1998). Recent scientific research discloses that babies are born with the capacity to understand a lot more than was previously thought to be the case (Kağıtçıbaşı, Sunar, Bekman, & Cemalcılar, 2005; Mustard, 2000; Spodek). This point is valuable to reveal the effect of enriched environments on children's capability to learn. Enriched environments including educational experiences alter brain structure and this process enhances all developmental domains of young children (Bredekamp & Copple, 1997). On this account, early childhood education that provides a variety of learning environments for young children plays a key role in the critical period in which the most significant developments occur in a person's life. Moreover, the main aim of the early childhood education is to enhance psychical, social-emotional, cognitive, language, social- emotional, psychical, and psychomotor and personal development of children who are younger than eight years of age. It is a systematic and planned education process that intends to reveal existing potential of children (Essa, 2005; Gordon & Browne, 2008). Hence, if education for sustainability is a lifelong process, then it must begin in the earliest years of life during the most significant developmental period. It must not be left until the child begins formal schooling. Consequently, Early Childhood Education for Sustainability (ECEfS) – a synthesis of 'early childhood education' and 'education for sustainability' is finally beginning to emerge as an active new field of interest (Elliott, 2010).

This emerging issue has not taken adequate interest from researchers. The preliminary survey (1996-2007) of a number of international research journals in early childhood education and ESD revealed that fewer than 5% of the articles was published over a 12-year period underlying both absence of studies in this research area and practical applications in early childhood education centers (Davis, 2009).

The beginning studies were initiated in Australia since 1997 with Sustainable Planet Project and reported in 2005. This project involved a range of activities about reducing waste, lowering water consumption and improving biodiversity. Researchers sought to highlight how one early education center has engaged sustainability issues into their curriculum. They regarded children's portfolios and observation notes as data source. Researchers had evidence that very young children are quite capable of integrating sustainability issues into their daily life (Davis, 2007). In another study, Prince (2011) conducted a two phase qualitative study with twelve preschool children, six parents and six preschool teachers. Researcher adapted case study and a two week integrated curriculum was implemented including children's environmental interests and two interviews were conducted with teachers, parents and children before and after integrated curriculum was implemented. Children were reported to learn about the issues of sustainability. As a final recommendation of this study, Prince suggested the curriculum integration between early childhood education and education for sustainable development with reference to extension of sustainability ideas of preschool children. In another qualitative study Lewis, Mansfield, and Baudains (2010) also stated that participation of preschoolers (N=36) in projects about sustainability issues was an effective and meaningful approach that engages them in sustainability learning experiences. Children were able to express their knowledge, attitudes, behavioral intentions and actions regarding sustainability issues in terms of reducing, recycling and respecting. Findings of this study also indicated the evidence that young children can learn about sustainability by actively participating in projects.

Haktanır et al. (2011) conducted a qualitative research to describe preschooler's ideas about environmental pillar. Researchers applied a short term intervention through the project approach and

made pre-post interviews with 80 preschool children. Their pre-interview findings indicated that preschoolers were capable of understanding reducing and reusing issues and post interviews revealed that preschool children's ideas improved after the intervention. Similar results also found in another study exploring preschoolers' ideas about reducing water, paper and electricity consumption and reusing old materials (Grodzinska–Jurczak, Stepska, Nieszporek, & Bryda, 2006). When we look at the studies about economical pillar of sustainable development, some of the researchers concluded that even the 4-year-old can manage recycling issues if they were given opportunity to be aware of the issue (Palmer, 1995; Palmer, Grodzinska-Jurczak, & Suggate, 2003) and they can reflect their ideas about recycling even after short term training (Ozturk-Kahriman & Karaaslan, 2010). Relevant literature presents limited information about social-cultural pillar of sustainable development. Kidd and Kidd (1990) found that young children have positive points of view towards animals and environments when they are provided activities such as visiting animal shelters and livestock farms. Similarly, Paprotna (1998) found that 6 years old preschool children (N= 54) can learn respecting and behaving well to nature when they have experiences in natural settings.

As a result of the above summarized state of the literature survey, it can be seen that there is a growing interest in studies relevant with education for sustainable development and young children. These studies proposed a rich description about preschoolers ideas on ESD in terms of reduce, reuse, recycle, and respect and the importance of educational experiences on improving their ideas. As another similar point of the relevant literature summarized above is that gender has not been considered as an important variable to differentiate preschooler's ideas regarding sustainable development. On the other hand, reports offer that gender perspective should be integrated into education for sustainable development issues (UNESCO, 1992, 2008b). Before gender perspective is integrated, we should know whether women and men differ in their ideas about sustainable development and when those ideas begin to be shaped. Despite lack of gender studies about ESD, environmental studies that are related to environmental pillar of ESD reveal us females are more willing to deal with environmental issues beginning from puberty (UNESCO, 1992).There is, however, some uncertainty as to how and when this gender differentiation begins. In order to contribute, the current study intends to examine preschool children's ideas about sustainability and gender differences. From this aspect, following research questions were posed:

1. What are the ideas of preschool children on 3 pillars (Environmental, Economical, and Social Cultural) of Sustainable Development and more-specified dimensions (7R's)?
2. Does gender seem to have an influence on preschool children's ideas about sustainable development and more-specified dimensions (7R's)?

Method

Research Design

This study intends to illustrate preschool children's ideas on sustainable development in terms of environmental, social- cultural and economical pillars. In order to have an in depth understanding of preschool children's ideas on three pillars of sustainable development, basic qualitative research methods were employed for both data collection and the data analysis procedures. According to Merriam (2009) basic qualitative research design seeks to achieve a very detailed understanding of an issue or a problem from first-hand records. In present study, in order to attain in-depth understanding about preschool children's ideas on sustainable development, data were collected from 36 preschool children and then analyzed by employing qualitative research techniques. The children's ideas were categorized based on 3 pillars and coded 7R's of sustainable development in terms of reuse, reduce, respect, rethink, reflect, recycle and redistribute (Duncan, 2011).

Participants

The participants of the study were 5-year (n=15) and 6-year old (n=21) preschool children. There were 19 boys and 17 girls, all from families with medium level socio-economic status. Participants of this study were selected through convenience sampling. They (n=36) were attending four different public preschools supervised by the Ministry of National Education of Turkey in Çankaya and Altındağ districts of Ankara. As for the school context, none of the schools specifically highlights education for sustainable development. However, only one out of the four preschools has a recycle bin in the school entrance and children can use it. After ethical and parental permissions were obtained, a participant list was prepared, and each appointment was made with the help of preschool teachers in each school.

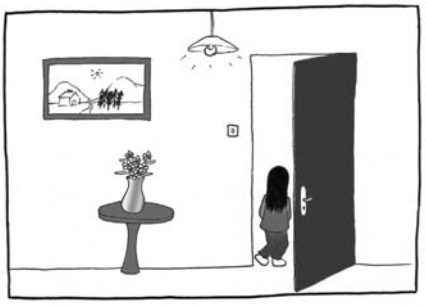

Figure1. *Example of Instrument Picture*

Data Collection Instrument and Procedure

The interview form was obtained by the pictorial questionnaire named "Preschool Children's Attitudes towards Environmental Issues". The interview form and the pictures telling each item were developed by Ozturk-Kahriman, Olgan, and Tuncer (2012). The interview form included 12 questions along with related pictures. In the current study, this pictorial questionnaire was used to explore preschool children's ideas about 3 pillars and 7 R of sustainable development. During data collection, children were interviewed face to face in an empty room to avoid interruptions. They were asked to look at pictures that are representing two different (a positive and the other negative) model behaviors. For example, as shown in Figure1, there are two pictures of a child leaving the room. In the left-hand picture, the child leaves the lights on when leaving the room whereas in the right-hand picture, the child turns the lights off. Then the interviewee is asked to express her/ his ideas about pictures. Some of the interview questions are exemplified in Table 2.

Table 2.
Examples of Interview Questions

Some children use both sides of the paper when they draw or write but other children use only one side of the paper when they draw or write. What do you think about it?
Some children never disturb or catch animals they find outside but some children like to disturb or catch animals. What do you think about it?
Some children put recyclable items in the recycle bin but other children just throw things away when they are finished with them. What do you think about it?
Some children give their old toys to other children or reuse them in different ways when they do not play them anymore. But others throw them away. What do you think about it?
Some children like living in crowded places such as cities and towns but other children like/ would like to live in places where there are more plants trees and animals. What do you think about it?

Data Analysis

The one-to-one interviews were audio-taped, and then each interview record was transcribed and coded by researchers. In the first stage, categories for 3 pillars and the codes for 7R were recorded together with several examples for each. After the codes were assigned, the data set was revised and coded once more for each pattern. Finally, the children's ideas were coded within 7R's for each question.

Validity and Reliability of the Study

There is a common point that qualitative studies need to ensure credibility of the research. Creswell (2007) suggested eight strategies to increase validity of qualitative studies: Prolonged engagement, triangulation, peer review or debriefing, negative case analysis, researcher bias, member checking, rich-thick descriptions, and external audits. Three of them were utilized in this study. Firstly, peer review or debriefing was used. Each phase of the study was monitored by two researchers who have experience in qualitative research. Secondly, rich and thick descriptions –detailed explanations- were used while reporting research model, participants, instrument, and data collection procedures and data analysis. Finally, member checking was done where participants were asked for meanings of their answers during the normal course of interview.

To increase reliability of the study, the data analysis process was conducted by authors independently (Creswell, 2007). Firstly, the first author coded the data, and then other author specializing in early childhood education for sustainable development, did recoding. The coders reached full agreement on all of the codes. The other strategy used to ensure reliability is about ethical issues. Consent form was

taken from parents and children were told during the implementation that they could stop or take a break if they got bored.

Findings

This research aimed to explore preschool children's ideas on sustainable development corresponding 3 pillars and 7R's and possible influences of gender on children's ideas. The preschool children's ideas about sustainable development were categorized in the line with 3 pillars and 7R's of sustainable development (Duncan, 2011). Findings are organized based on research questions and corresponding sample answers for each dimension and sub-dimension are presented below. In figure 2 and subsequent explanations, 'F' and 'M' refer to female and male children, respectively.

What are the Ideas of Preschool Children on 3 Pillars and 7R's of Sustainable Development?

The first research question aimed to explore preschool children's ideas on sustainable development corresponding to 3 pillars and 7R's. Findings regarding the "Environmental Pillar" revealed that a large number of preschool children (n= 23) in the sample mentioned reducing water, paper and electricity consumption for saving the environment. The number of ideas about "reuse" slightly differed from "reduce". Only thirteen children (13) out of 36 emphasized reusing old things to protect the environment. Examples from children's answers can be seen below:

> *"Cars flow exhaust that dirties nature I think my father should drive less" (P 14, F)*
>
> *"If we consume electricity less, less radiation is fired, so that we cannot harm nature as much." (P 11, M)*
>
> *"We can use paper less, if we use back side of paper, tree are cut down less than now, so that nature can survive better." (P11, F)*
>
> *"It is bad to chuck out old toys, instead of my mother and father's fixing it" (P3, M)*
>
> *"We can use something like old toys and broken things as junk materials, for example, I created a mobile using waste CDs." (P 30, F)*
>
> *"I gave my bicycle to my friend, because in order to produce new bicycle, much money, time and energy is required." (P 22, F)*

Findings concerning the "Social- Cultural Pillar" illustrated that two-thirds of the preschool children (n= 24) underlined respecting animals, plants, nature and people as can be seen in their explanations below. On the other hand, findings of this pillar revealed that preschool children did not seem to have an idea about "rethink" and "reflect".

> *"Their survival is very important because some of animals extinct they have right to live." (P 16, F)*
>
> *"Animals like freedom, if we take them to our home; they miss surprises in the nature."(P 30, M)*
>
> *"Wild animals should not be killed even if they harm people." (P 19, F)*
>
> *"I never disturb cats and dogs in the street because they can get sad and unhappy."*
>
> *(P 13, M)*

Findings about the economical pillar demonstrated that a few (n= 9) preschool children considered recycling as exemplified below but no children mentioned redistributing.

> *"Plastics, glasses, and papers that are thrown into recycle bin are recycled, with this way we can save the nature." (P 7, M)*
>
> *"Wastes threw away recycle bin are carried to factories and recycled to glass, plastic, and paper. We should always separate wastes." (P 9, M)*
>
> *"Recycle bin recycle old papers, glasses, plastics and cans and therefore we save nature."(P 11, F)*
>
> *"I think we should separate bottles, papers and cans and put them into different bins to be recycled." (P 20, F)*

Does Gender seem to have an Influence on Preschool Children's Ideas about 3 Pillars and 7R's of Sustainable Development?

The second research question was formulated to scrutinize whether gender seem to have an influence on preschool children's ideas regarding sustainable development or not. Children's responses indicate that gender is not a variable that differentiates preschool children's ideas on 3 pillars of sustainable development. The chi-square test was conducted to confirm qualitative findings. According to the statistical results regarding the environmental pillar, reduce [x2 (1, n= 36): p= .137] and

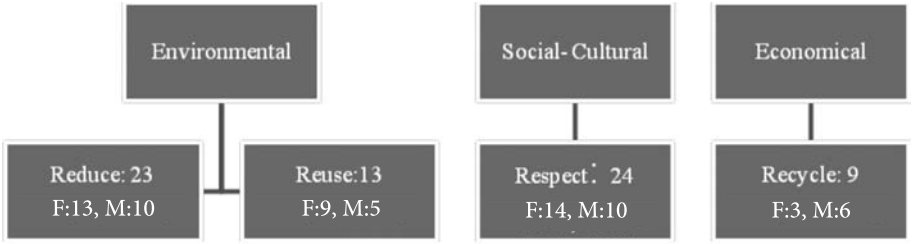

Figure 2. *Summary of Findings*

reuse [x2 (1, n= 36): *p*= .102] were not associated with gender. Also, the results respecting the social-cultural pillar [x2 (1, n= 36): *p*= .059] were found to be uncorrelated with gender. Those corresponding to the economical pillar, recycle [x2 (1, n= 36): *p*= .335] was similarly not linked with gender.

Discussion

The present study aimed to investigate preschool children's ideas about sustainable development and gender differentiations. In the relevant literature, there is scarcity of research about preschool children's ideas in the line with 7R's of sustainable development. Findings of this study indicated that most of the preschool children mentioned about reducing and reusing in the line of environmental pillar. Likewise, Haktanır et al. (2011) and Grodinzka–Jurczak et al. (2006) found that young children can express their ideas about reduce and reuse issues. Moreover, Haktanır et al. explained that these two concepts can easily be made meaningful for children in preschool settings with different hands on projects and activities. Also, Turkish National Curriculum of Early Childhood Education includes examples of this kind of activities (Ministry of National Education [MONE], 2006).

Regarding economical pillar of sustainable development, a small number of studies pointed out recycling issues. Findings of these studies (Palmer, 1995; Palmer et al., 2003; Ozturk-Kahriman & Karaaslan, 2010) indicated that young children can understand recycling issues when they confronted with enough stimulus and experiences about recycling. Correspondingly, the current study findings also showed that all preschool children who attended the school with a recycle bin and recycling activities were familiar with recycling issues. On the other hand, the rest of the children did not have similar experiences or stimuli.

In line with social-cultural pillar of sustainable development, findings of this study indicated that preschool children have higher levels of respect towards plants and animals. Similarly, Kidd and Kidd (1990), and Paprotna's (1998) studies results revealed that even young children can reflect their positive ideas about plants and animals. In fact, preschool children have many opportunities to interact with plants and animals in their daily life, in school settings and at home as well as outside (Kidd & Kidd; Paprotna).

Based on the current study findings, it can be implied that preschool children's ideas about 7R's of sustainable development are limited in some terms. Their answers to questions indicated that they do not have any idea about reflect, rethink and redistribute aspects. Underlying reason of children's unfamiliarity with reflect, redistribute and rethink can be their cognitive level. According to Piaget (1959), preschool children are still at preoperational stage that they may have difficulties to understand these abstract concepts. Therefore, in order to help children internalize these concepts, they need more concrete materials and hands-on experiences about redistribute, reflect and rethink. As Haktanır et al. (2011) reported preschoolers' ideas about sustainability issues can be enlarged by providing them some tangible examples from their life.

Based on the second research question, findings indicated that gender does not seem to have an influence on preschoolers' ideas about sustainable development. In the relevant literature, there is not any gender study that researchers could find about sustainable development. However, as mentioned in Goteborg Recommendations, we believe the importance of gender perspective since studies conducted with older ages indicated that women have more positive ideas, attitudes, and behaviors towards sustainability (Schultz et al., 2001). Therefore, it is important to investigate gender differences in preschool age to understand when this positive approach of women begins to be shaped.

Conclusion

In this study, preschool children expressed their ideas about reduce, reuse, recycle and respect dimensions while they did not mention redistribute, reflect and rethink. Children' familiarity with reduce, reuse, recycle and respect can be explained by children's having many experiences about these more concrete concepts in preschool settings (Güler, 2011). As Haktanır et al. (2011) underlined that different educational activities and projects help children understand sustainable development. This may show the importance of providing stimuli and experiences about sustainable development in early childhood settings. In order to enhance children's ideas, sustainable practices in terms of reduce, reuse, recycle, redistribute, respect, reflect, and rethink can be integrated into early childhood education curriculum (Duncan, 2011). Early childhood educators are responsible for providing opportunities for children to meet sustainability issues and enhance their ideas; therefore they can be trained to be more open to the integration of sustainability issues in their curricula. In addition, teacher can encourage parent and society to accompany this process (Prince, 2011).

In conclusion, there is, therefore, a need to further develop existing early childhood education approaches that offer experiences for young children regarding education for sustainable development issues and involve active participation of teachers, parents and society in this process.

Based on the findings, we recommend that further research can be conducted to determine and analyze young children's attitudes and behaviors related to sustainable development in the long run. Moreover, possible influences of school types (public, private, eco-school etc.) and providing or not in-class visual and printed stimuli on children's ideas and behaviors related to sustainable development can be investigated. Although, our study indicates that gender seems not to have an influence on preschoolers' ideas about sustainable development, further research should be conducted to explore the gender factor since it is addressed that females have key roles with more positive ideas, attitudes, and behaviors in enhancing sustainable development practices (Schultz et al., 2001; UNESCO, 1992).

References

Bredekamp, S., & Copple, S. (Eds.). (1997). *Developmentally appropriate practice in early childhood programs*. Washington, DC: National Association for the Education of Young Children.

Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches.* Thousand Oaks, CA: Sage.

Davis, J. (2007). *Climate change and its impact on young children*. Early Childhood Australia. Retrieved 25/02/08 from www.eca.org.au.

Davis, J. (2009). Revealing the research 'hole' of early childhood education for sustainability: A preliminary survey of the literature. *Environmental Education Research, 15* (2), 222- 241.

Duncan, E. (2011). *Report Part 2 – ESD in practice.* Norway: OMEP (Organisation Mondiale Pour L'Éducation Préscolaire).

Elliott, S. (2010). Essential, not optional: Education for sustainability in early childhood centers. Exchange: *The Early Childhood Leaders' Magazine 192*, 34-37.

Essa, E. L. (2005). *Introduction to early childhood education* (4th ed.). New York: Thomson Delmar Learning.

Gordon, A. M., & Browne, K. W. (2008). *Beginning essentials: In early childhood education*. Canada: Thomson.

Grodzińska-Jurczak, M., Stępska, A., Nieszporek, K., & Bryda, G. (2006). Perception of environmental problems among preschool children in Poland. *International Research in Geographical and Environmental Education, 15* (1), 62-76.

Güler, T. (2011). Environmental education. In B. Akman, G. Balat & T. Guler (Eds.), *Science education in early childhood* (pp. 181-200). Ankara: Pegem Akademi Publishing.

Haktanır, G., Güler, T., Yılmaz, A., Şen, M., Kurtulmuş, Z., Ergül, A. et al. (2011). *Reduce and reuse: Turkish preschool children's education for a sustainable world.* Paper presented at the meeting of the World Organization for Early Childhood Education in Brazil.

Kağıtçıbaşı, Ç., Sunar, D., Bekman, S., & Cemalcılar, Z. (2005). *Continuing effects of early intervention in adult life: Preliminary findings of Turkish early enrichment project second follow up study*. Istanbul: Mother Child Education Foundation Publications.

Kidd, A. H. & Kidd, R. M. (1990). Social and environmental influences on children's attitudes toward pets. *Psychological Reports, 76*, 807-818.

Lewis, E., Mansfield, C., & Baudains, C. (2010). Going on a turtle egg hunt and other adventures: Education for sustainability in early childhood. A*ustralasian Journal of Early Childhood, 35* (4), 95-100. Retrieved from EBSCOhost.

Merriam, S. B. (2009). *Qualitative research and case study applications in education*. San Francisco: Jossey Bass.

Ministry of National Education (MONE). (2006). *36-72 Aylık çocuklar için okul öncesi egitim programı ve okul öncesi eğitim kurumları yönetmeligi*, The curricula and regulation for early childhood education. İstanbul: Morpa Kültür Yayınları.

Mustard, F. (2000, December). *Early childhood development: The base for a learning society*. Paper presented at the HRDC/ OECD Meeting, Ottawa, Canada.

OMEP. (2010). *OMEP World Congress and Assembly in Götheburg University*. Retrieved October 5, 2011 from http://www.omep.org.gu.se/digitalAssets/1314/1314390_esd-congress-report-child-interviews.pdf

Ozturk-Kahriman, D., & Karaarslan, G. (2010, August). *Effect of a short term intervention on preschool children's attitudes towards recycling and reusing.* Paper presented in the European Conference on Educational Research, Helsinki, Finland.

Ozturk-Kahriman, D., Olgan, R., & Tuncer, G. (2012). A qualitative study on Turkish preschool children's environmental attitudes through ecocentrism and anthropocentrism. *International Journal of Science Education, 34,* 629-650.

Palmer, J. A. (1995). Environmental thinking in the early years: Understanding and misunderstanding of concepts related to waste management. *Environmental Education Research, 1* (1), 35–45.

Palmer, J. A., Grodzinska-Jurczak, M., & Suggate, J. (2003). Thinking about waste: Development of English and Polish children's understanding of concepts related to waste management. *European Early Childhood Education Research Journal, 11* (2), 117–139.

Paprotna, G. (1998). On the understanding of ecological concepts by children of pre-school age. *International Journal of Early Years Education*, *6* (2), 155-164.

Piaget, J. (1959). *The language and thought of the child* (trans. M. Gabain). London: Routledge & Kegan Paul Ltd (Original work published in 1926).

Prince, C. (2011). Sowing the Seeds: Education for sustainability within the earlyyears curriculum. *European Early Childhood Education Research Journal, 18* (3), 273-284. Retrieved from EBSCOhost.

Siraj-Blatchford, J. (2009). Editorial: Education for sustainable development in early childhood. *International Journal of Early Childhood, 41* (2), 9-22.

Siraj-Blatchford, J., Smith, K., & Pramling Samuelsson, I. (2010). *Education for sustainable development in the early years.* Organisation Mondiale Pourl´Education Prescolaire (OMEP).

Schultz, I., Hummel, D., Empacher, C., Kluge., D., Lux, A., Schramm, E. et al. (2001). *Research on gender, the environment and sustainable development: Studies on gender impact. Assessment of the Programmes of the 5th Framework Programme for Research, Technological Development and Demonstration.* Retrieved May 10, 2012 from ftp://ftp.cordis.europa.eu/pub/eesd/docs/wp1_endversion_complete.pdf

Spodek, B. (Ed.). (1993). *The handbook of research on the education*. New York: Teachers College Press.

UNESCO. (1992, June). *Agenda 21–Report of the United Nations Conference on Environment and Development. Chapter 36. Promoting education, public awareness and training.* Rio de Janeiro, UNESCO.

UNESCO. (1997). *Educating for a sustainable future: A Trans-disciplinary vision for concerted action.* Retrieved October 5, 2010 from http://unesdoc.unesco.org/images/0011/001106/110686eo.pdf

UNESCO. (2005). *United Nations decade of education for sustainable development (2005-2014).* Retrieved October 5, 2010 from http://portal.unesco.org/education/admin/ev.php

UNESCO. (2008a). *Early childhood and its contribution to a sustainable society*. Paris: UNESCO.

UNESCO. (2008b). *The Gothenburg Recommendations on Education for Sustainable Development.* Retrieved 30/01/09 from http://omep.vrserver2.cl/cgibin/procesa.pl?plantilla=/archivo.html&bri=omep&tab=art_6&campo=c_file&id=270

WCED. (1987). *Report of the World Commission on Environment and Development*. General Assembly Resolution 42/187, 11 December 1987.

Wolfe, J., & Brandt, R. (1998). What we know from brain research. *Early Childhood Research Quarterly Educational Leadership*, *56* (3), 8–14.