# World from children's eyes: This is our World!

**Ebru Guller**\*, Department of Architecture, Dokuz Eylul University, Buca, 35160 Izmir, Turkey

**Ayca Tokuc**, Department of Architecture, Dokuz Eylul University, Buca, 35160 Izmir, Turkey

**Abstract**

Knowledge and awareness of environmental and ecological issues, and the propensity to think and care about these issues from a wide perspective, i.e., environmental consciousness, are necessary, and can be improved by environmental education. This study aims to evaluate and improve environmental consciousness of children. This work shows the preliminary results of a workshop entitled 'This is our world'. In this context, in the first stage, how the children see the world that they are living in is researched by examining their answers to the question 'What kind of a place is the world?' In the second stage, the children answered the question 'What kind of a world do we want?' and presented their ideas about the world they dream to live in. In the third stage, the children designed on balloons, which represented the world. Their answers and designs were collected via a semi-structured interview form and two- and three-dimensional visual materials, i.e., pictures and models. The data were evaluated through keywords related to their conceptual development and environmental consciousness. Content analysis and semiotic analysis were applied to the data. In addition, the written data, the visual data and the analysis results were triangulated to test for consistency between the data and analysis results. In conclusion, how to build a healthy world was examined by deciphering the children's dream world.

**Keywords:** Environmental education, environmental perception, environmental consciousness, children.

\* ADDRESS FOR CORRESPONDENCE: **Ebru Guller,** Department of Architecture, Dokuz Eylul University, Buca, 35160 Izmir, Turkey.
*E-mail address*: ebru.guller@deu.edu.tr / Tel.: +90-232-301-8452

## 1. Introduction

These days, environmental problems, which have been on the agenda since the 1960s, including decreasing natural resources, increasing pollution as a result of urbanisation and industrialisation, global climate change and global warming, desertification of the soil, depletion of the ozone layer, etc., have become more visible and noticeable through extreme global events around the world, such as tsunami, hurricane, earthquake, irregular weather events, climate changes, and the disappearance of tropical forests. Therefore, people have become more sensitive to their rapidly changing world. Since the main cause of environmental problems is human origin, this situation requires individuals to become more active and to do something for the sake of the world (Kola-Olusanya, 2017). Creating an environmental paradigm against environmental deterioration that threatens the future of the world, and hence the future of people, and adopting environmentally friendly behaviours require effort (Khan, 2018). Thus, the significance of environmental education given to individuals and students' cognitive structures related to environmental concepts have become evident (Ozcan & Demirel, 2019) with emphasis on it being lifelong and comprehensive. Environmental education is a multidisciplinary research field that has focused on cognitive knowledge since its conception. However, as Nazir and Pedretti (2016) point out, there is a shift in this focus 'towards raising peoples' environmental consciousness in deep and substantive ways'. In this article, environmental consciousness refers to knowledge and awareness of environmental and ecological issues, and the propensity to think and care about these issues from a wide perspective.

Various studies (Collado & Evans, 2020; Jung & Cho, 2015; Lee, Sung, Wu, Ho & Chiou, 2020) indicate that environmental experience and environmental consciousness are critical factors that affect pro-environmental behaviour. Therefore, environmental education – beginning from family life and continuing in schools and extracurricular learning environments – is necessary in order to reach a level of environmental consciousness and to protect the balance between manmade and natural environments (Guller, Tokuc, Kokturk & Savasir, 2019). There are many programmes that facilitate environmental experience (Couper & Porter, 2016; Jeronen, Palmberg & Yli-Panula, 2017; Otto & Pensini, 2017); however, their effectiveness is not always ensured. For instance, Garner, Taft and Stevens (2015) compared the effect of attending two similar summer camps on the issues of connection with nature, environmental stewardship, interest in environmental learning and discovery and environmental consciousness. Their pre- to post-camp questionnaire results show a significant increase on the issues of interest in learning and environmental consciousness on the camp that provided intentional environmental education, while there was no change in the results of the camp that did not provide such education. Although this study has some limitations, and its generalisation to the whole populace can be problematic, its results indicate that the involvement of cognitive processes in interaction with the environment has affective results.

Gifford and Nilsson (2014) reviewed various studies to look for personal and social factors that affect pro-environmental behaviour and have found 18 factors. These factors are childhood experience, knowledge and education, personality and self-construal, sense of control, values, political views and worldviews, goals, felt responsibility, cognitive biases, place attachment, age, gender, chosen activities, religion, urban versus rural residence, norms, social class, proximity to problem sites and cultural and ethnic variations, and none of the above. Yet, Gunduz (2013) showed that gender is not a significant issue for primary school students. She estimates this is because primary school children do not have a fully developed environmental consciousness, rather their consciousness is in the beginning stages of development.

This article aims to investigate the expectations and hopes for the world where the children want to live in. This is managed by examining the results of a workshop entitled 'This is our world!', held on 27–29 September 2019, during the H2020 Researchers Night 2019 and 4th International Mersin Science Festival. The participants were children from primary and secondary schools. They defined the world of their dreams through keywords and designed this world on balloons. The manner in which

the children represented their keywords and designs was investigated in terms of their outlook and design approach to environmental issues. In addition, their design methods were also evaluated.

## 2. Methods

The aim of this study is to evaluate and improve the environmental perception of children. This work shows the preliminary results of a workshop held in the 4th International Mersin Science Festival in 2019 and H2020 Researchers Night in September 2019. There were many simultaneous workshops and it reached 43,276 visitors. The workshop entitled 'This is our world!' was carried out with 27 primary (11 from 1st and 2nd classes; 16 from 3rd and 4th classes) and 11 secondary school students (5th and 6th classes), with 24 girls and 14 boys. The ages ranged between 6 and 13 years.

In this context, in the first stage, how the children see the world that they are living in is researched through their answers to the question 'What kind of a place is the world?' in the pre-event questionnaire. In the second stage, the children answered the question 'What kind of a world do we want?' and presented their ideas about the world they dream to live in through a semi-structured interview form (Figure 1a). In the third stage, the children visually designed in two dimensions and three dimensions on balloons, which represent the world, by using different materials, such as cotton, eva, felt, etc. (see Figure 1b). The catch phrase of their work is 'Let's design our world'.



a                b

**Figure 1. Stages of the workshop**

All the data were analysed by qualitative research methods. The answers of the first and second stages were evaluated via content analysis to realise concepts and themes (Yildirim & Simsek, 2008). The data consist of keywords related to the subjects' conceptual development and environmental consciousness. The keywords were summarised and categorised. Meanwhile, the third stage added the kinaesthetic dimension as observed via two- (2D) and three-dimensional (3D) visual materials. The visual materials allowed the participants to directly share their own realities (Creswell, 2015). How to build a healthy world was examined, while the children's dream world was deciphered by semiotics. In addition, data were triangulated and tested for consistency between data and analysis (Patton, 2014). In conclusion, children put forward their perception of the world. The data were categorised into keywords and deciphered, according to their education levels, gender and the consistency between their writings and their designs.

This study has some limitations. The setting of the science fair did not allow for a strict control of participants; therefore, age, education level and gender of the participants are not balanced. The analysis of the end-products showed that an analysis according to the education levels of the participants would lead to meaningful results. In this context, the education levels of the students are separated into three: Level I consists of 1st and 2nd years of primary school; Level II contains 3rd and 4th years of primary school; and Level III consists of 5th and 6th-years secondary school students.

Another limitation was the materials used in the study; they were usually soft and included cotton, eva, felt and various paper-based products. The materials they did not include any rigid materials that would harm the balloons, therefore making linear 3D elements were not easy.

## 3. Results and Discussion

The keywords that the children used to describe their perceptions of the environment and the world they live in and to describe the world of their dreams were quite diverse, reaching up to 36 keywords during defining the existing world and up to 50 keywords during defining the world of their dreams. Keywords of similar meanings were grouped together, and 17 keywords were assessed in the end; they are given in Table 1. The combination of similar keywords is as follows: 'accessibility', 'sidewalk for disabled', 'justice', 'no poverty', 'no violence against women' and 'equality between men and women' are grouped together under the title of 'liveable for all'. The keywords 'goodness', 'love' and 'peace' are collected under the title of 'positive feelings'. Keywords 'no water pollution', 'no air pollution', 'clean', 'abundant oxygen', 'no garbage' and 'recycling' are evaluated together under the title of 'clean environment'. The keywords 'nature' and 'natural environment' are combined under the title of 'natural environment'. Definitions that include general geographic information, such as mountain, sun, etc., are also aggregated under this title. As the number of children focusing on trees and forest keywords was very high, there was also a separate title of 'trees' for evaluation. Keywords that focus on water, such as 'seas', 'stream' and 'water sources', are merged together under the title of 'water issues'. 'Child friendly' and 'play' keywords are clustered under the title of 'child friendly'. Keywords such as 'villas' and 'houses', which define a city or a village as a built environment, are combined under the title of 'living space'. The answers of 'blue', 'green' and 'colourful' keywords, which are used for the dream worlds, are grouped together under the title of 'defined by colour'. The title of 'education' consists of the keywords of 'school', 'library' and 'environmental education', while the 'renewable energy' title holds the keywords of 'sun', 'windmill' and 'dam'.

**Table 1. Keywords and their frequencies according to education levels and gender**

| Keywords | $f_{level I}$ | $f_{level II}$ | $f_{level III}$ | $f_{female}$ | $f_{male}$ | $n$ |
|---|---|---|---|---|---|---|
| Humane | 27.3 | 18.8 | 36.4 | 25.0 | 28.6 | 10 |
| Nature friendly | 0.0 | 0.0 | 18.2 | 4.2 | 7.1 | 2 |
| Child friendly | 18.2 | 25.0 | 18.2 | 25.0 | 14.3 | 8 |
| Liveable for all | 45.5 | 18.8 | 36.4 | 37.5 | 21.4 | 12 |
| Animal friendly | 27.3 | 31.3 | 54.5 | 50.0 | 14.3 | 14 |
| Natural environment | 36.4 | 25.0 | 27.3 | 33.3 | 21.4 | 11 |
| Trees | 18.2 | 43.8 | 45.5 | 37.5 | 35.7 | 14 |
| Water issues | 9.1 | 12.5 | 27.3 | 16.7 | 14.3 | 6 |
| Clean environment | 54.5 | 43.8 | 36.4 | 41.7 | 50.0 | 17 |
| Renewable energy | 1.8 | 6.9 | 2.8 | 9.6 | 2.0 | 5 |
| Living space | 9.1 | 37.5 | 9.1 | 20.8 | 21.4 | 8 |
| Less concrete | 0.0 | 12.5 | 9.1 | 12.5 | 0.0 | 3 |
| Positive feelings | 63.6 | 43.8 | 45.5 | 70.8 | 14.3 | 19 |
| Beautiful | 27.3 | 37.5 | 18.2 | 25.0 | 35.7 | 11 |
| Defined by colour | 36.4 | 31.3 | 18.2 | 25.0 | 35.7 | 11 |
| Education | 0.0 | 12.5 | 18.2 | 8.3 | 14.3 | 4 |
| Technology | 9.1 | 6.3 | 9.1 | 4.2 | 14.3 | 3 |

The metaphor 'World' is observed and what is not observable is taught from many books, documentaries and lectures before formal education. The environment forms a big part of this metaphor and is investigated by many researchers via content analysis. Shepardson (2005) infers that middle school students have a limited ecological understanding of the environment as an area that supports animal life, rather the students refer to the environment as a place they satisfy their needs like food. Dogan (2017) determines 25 metaphors related to the environment from middle school

students, and interprets his findings as the students' education and life experiences formed intuitive perceptions related to concept of the environment, yet these perceptions are weak and inadequate.

Table 1 shows 'the frequency of the usage of the keywords' and 'how many times they are used'. The frequency of use according to the education levels and the frequency of use according to gender are analysed separately. The keyword 'nature friendly' is used only in education Level III. The 'less concrete' keyword is only used in Level II and Level III. The living space is mostly used by the participants from Level II. The frequency of use of the training keyword increases with the level of education. The keyword 'animal friendly' is most often used by the participants from Level II and Level III. 'Positive feelings' and 'natural environment' are among the most mentioned keywords in each group. In terms of gender, only three girls expressed their desire for 'less concrete'. In addition, girls express their feelings more than boys by utilising the keyword 'positive feelings'; moreover, they were also more widely mention the keyword of 'animal friendly'. It is significant that 'technology' keyword is used more in boys' dream world than girls.

The models are evaluated as being 2D or 3D; however, only the trees gaining the third dimension does not mean that the model itself gained a third dimension since all of the children affected each other by interacting through the workshop process, and after a while all the models contained similar 3D trees. A general evaluation can be that the participants of younger age and therefore of lower education level remained more literal (pure knowledge) and 2D in their designs; meanwhile, the older participants designed their models in 3D. The children, whose 3D perception is more developed, preferred producing the whole model in 3D – by designing all objects in 3D – while the others preferred to work by drawing or cutting and pasting on the balloon in 2D. Although 'positive feelings' and 'clean environment' were the most frequent keywords, most of the elements on the 3D models were concrete elements: trees, seas, buildings and animals. Trees were used to represent 'trees' and other metaphors like 'clean environment' in addition to 'natural environment', 'parks', 'liveable for all' or 'less concrete'; therefore, they dominated the visual data and were interpreted more deeply by triangulating data. Gungor Cabbar (2020) investigated trees as a metaphor that can be used to tell, explain or relate to an unknown concept and associates 111 metaphors for trees from 295 4th-years students living in different cities of Turkey. She categorised the data, in which the most frequent three categories were 'tree as a living being', 'tree as the source of life' and 'tree as a home', which also agree with the interpretation of this study. Guller, Tokuc, Kokturk and Savasir (2020) investigated environmental awareness through metaphors for environmental problems and solution proposals, and report nine environmental problems and 111 solution proposals; thus, they propose a problem-solution and group work and discussion-based teaching model for environmental awareness.

The keywords and designs on the balloons were evaluated according to their consistency, in other words the designs that successfully reflected the written keywords are defined as consistent, while the designs that do not show a good match with the writings are called inconsistent. Even though some designs could be evaluated as successful in terms of their outlook to the environment and the keywords they offered, they were classified as inconsistent when they did not suit the keywords the designer (child) mentioned before starting the design. Table 2 shows the frequency of consistency between keywords and designs according to the education levels I, II and III and gender (female, male), and the total number of either consistent or inconsistent designs. In contrast to the expectations, as the level of education increased, the consistency between designs and consistency decreased. This has two main reasons from the viewpoint of the workshop leaders. First, as the age and education level of the children increased, they conveyed more abstract and intangible hopes and dreams about the world they want to design; however, the representation of these ideas were hard, therefore some of the designers could not find ways to present these issues and their feelings. This finding is in alignment with Guller et al.'s (2019) study with 130 middle school students. Second, the quality of time they could spend on their designs in the science fair was limited because they also wanted to attend to other activities competing for their time and attention. On the contrary, the

younger children were eager to work for hours on the balloons until they finished their designs. The consistency percentage of females and males does not show a significant difference.

Table 2. Consistency of keywords and designs according to education level and gender
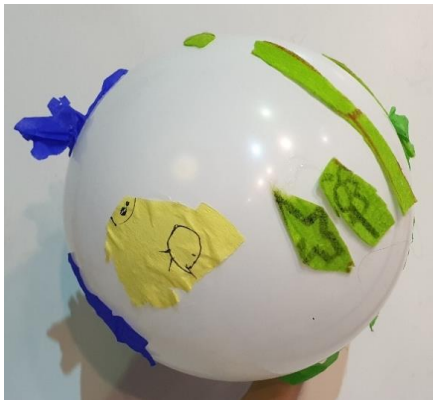
| Consistency between keywords and designs | $f_{level\ I}$ | $f_{level\ II}$ | $f_{level\ III}$ | $f_{female}$ | $f_{male}$ | Total number |
|---|---|---|---|---|---|---|
| Inconsistent | 9.1 | 25.0 | 45.5 | 25.0 | 28.6 | 10 |
| Consistent | 90.9 | 75.0 | 54.5 | 75.0 | 71.4 | 28 |

### 3.1. Inconsistent

A female student from primary school (education Level I) wrote of her dream world as 'Good people, nature, flowers, sisterhood, no offense, a world in peace'. The design is in 2D and shows pieces of a tree, a flower, an animal and some literal natural objects. Yet, the good feelings expressed in her writing do not exist, as shown in Figure 2a.

A female student from primary school (education Level II) wrote of her dream world as 'I want it to be beautiful. And I want everyone on the world to live a very good life without arguing. And I want everybody to be friends'. These good expectations cannot be clearly observed on her design (Figure 2b), although we can find blues and greens that can be easily associated with natural environment; however, this design is also inconsistent because the keywords and the design do not fit.

A male student from primary school (education Level II) wrote of his dream world as; 'I want the world to be a good, kind, charitable place'. This definition depends on just abstract concepts; therefore, they are also very difficult to reflect on the design. That is why they cannot be seen and identified on the balloons easily, as is the case in this design (Figure 2c).



a



b

c                                                              d
**Figure 2. Samples of inconsistency between keywords and the designs**

A female student from secondary school (education Level III) wrote of her dream world as 'For me, technology should develop much more but without giving damage to the world'. While she emphasises technology as the main keyword, there is no reflection of it on her balloon (Figure 2d). Therefore, it is regarded as inconsistent.

### 3.2. Consistent

A male student from primary school (education Level I) wrote of his dream world as 'a world of technology, a green and magnificent world, a world with beautiful people, cars working with solar energy, hearts spread everywhere on the world'. He expressed his dream on the balloon via cutting and pasting 2D objects and writing. His design incorporates various robots and an environmentally conscious production band that relays technology and a house for scientists who will develop the world. Sun and trees represent the natural environment and occupy a large amount of space on the balloon. Technology and natural world form a balance together (Figure 3a).



a



b



c



d

e                                                    f

**Figure 3. Samples of consistency between keywords and the designs**

A female student from primary school (education Level I) dreamt of, 'a just, joyful, happy, colourful, animal friendly, clean, sunny world full of trees and games'. The student represented the tangible and intangible aspects of her dream on the balloon by using a huge smiling sun, a colourful rainbow, green and blue colours for nature and water, fishes in the water, a one-storey house neighbouring the green and blue elements and a flower garden (Figure 3b).

A female student from primary school (education Level II) emphasised the keywords of the colour green, animal friendly and living space in her dream of 'little villages, abundant green areas, cats, dogs, animals'. While her dream consisted of mostly literal descriptions, she added elements that represent renewable energy and education onto her model world. The dam that is related to renewable energy also involves cleanliness inherent to the nature with a swimming fish. She designed a library near the living area as a focal point for education (Figure 3c).

A female student from primary school (education Level II) wrote of her dream world as, 'technologic, I want to have fun, logical and necessary places. I want to have places where both children and adults can use. I want to have much nature and many plants, and I want the humans to use everywhere according to its purpose'. The balloon transfers geographical information with green landmasses and blue seas and is 2D. A playground within trees covers a significant area. The concept of positive feelings (love) is symbolised by hearts and enters as an additional keyword from the thinking process while designing the product (Figure 3d).

A female student from secondary school (education Level III) wrote of her dream world as, 'I want a clean, good, beautiful and friendly world'. The keywords positive feelings, clean environment and humane are emphasised in this description. The buildings on the balloon are two to three storeys high (low-rise) spread inside the greenery. Her design exceeded her written description and she added a representation for the keyword of animal friendly on the balloon. She showed animal friendly with animal figures like butterflies, fishes and a frog (Figure 3e).

A female student from secondary school (education Level III) described her dream world as, 'I want a world that is child friendly and nature friendly, and full of good people'. Her narrative is associated with the keywords of humane, child friendly, nature friendly and defined by colour. Her design has many levels of presentation. She added the slogan of 'DO NOT FIGHT' onto the balloon. A cheerful picnic scene, a pleasant tea-drinking scene, figures of man and women evoking gender equality show the depth of her thoughts. Animals and nature talk with tags of 'protect us' and 'protect the nature', respectively, which support the expression of the balloon (Figure 3f).

## 4. Conclusion

One of the main reasons for the increasing many environmental problems that we are facing today is the lack of knowledge and environmental awareness amongst individuals. Environmental awareness can be raised with educational and informative programmes; in addition, creating awareness in this subject from a young age can also be possible by environmental education. In this context, children's thoughts on environmental concepts can be counted among important factors to be considered. Yet, educating only children is not enough. Trainers in this field should also be actively involved in learning new knowledge and practice different educational models on providing effective environmental education. Thus, this article considers it important to provide feedback on the selection, organisation and teaching of environmental issues and to provide opportunities for the development of environmental education programmes for children by presenting a sample workshop process.

'This is our world!' workshop incorporated 1.5 hours of production time, when children concentrated on the world they are living on and questioned the environment that they live in, while thinking of the problems they see. They defined the world as a whole, with its positive and negative connotations. At the same time, they thought about improving its conditions and forming a world of their dreams. This study supports children's pro-environmental thinking practices and guides them to gain a critical yet constructive approach at the same time. These kinds of design practices are not common in the Turkish education system's school curricula, whereas they are important to consolidate the existing lessons.

The three domains of learning are involved through this workshop process. In the first stage, mainly the children's cognitive processes are targeted with a concrete question of 'What kind of a place is the World?' The second stage aims to add the affective domain by involving feelings and values with the question of 'What kind of a World do we want?' The third stage of design adds a kinaesthetic dimension and supports the cognitive or affective answers with the motto 'Let's design our World'. The 3D design samples are usually successful in focusing and supports the cognitive or affective structure of the child's dream world.

Fleshing out the designs, which involved a 3D thinking process, took the written answers further in terms of environmental awareness and the increase in environmental consciousness was observed on the finished models. Primary school students were more excited and eager to take part in the study, due to the materials (balloons) used in the study. They wanted to stay until their designs were finished (after the allotted time of 1.5 hours), thus they spent more time on their designs. As the age and education level increases, the use of abstract concepts also increased. Generally, the little designers' dreams that they articulate in written form and their designs on the balloons were consistent with each other in terms of emphasised keywords.

Design practices are at the core of many disciplines, such as engineering, architecture, etc.; therefore, they must be more integrated into formal education since interacting through many mediums is necessary to progress design thinking. The children are aware of many problems the world is facing and this study made them to think about these problems. It assisted them to realise that they have to formulate and dream about their solutions, and to make efforts to change the world into their own dream world. Making decisions about the environment in which they do not normally have a say in and changing the world to a place they want to live in were the most exciting parts for them. The final presentation of their designs on balloons gave them a chance to share their ideas with the other students, their parents, their teachers and the public, and to see the differences between many designs and ways of expression. This study was limited in the sample size, that is age, education level, gender and written communication skills of the children, yet this was a pre-study before a systematic workshop organisation. A continuation of the study with a more focused group in further studies will show the significance of the limitations.

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