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Images of Future Technology Generated by Primary School Students through Their Paintings

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Abstract

This study aims to investigate the elementary school students' perceptions of future technology through their pictorial representations. The study carried out with fifth-grade elementary school students was applied to a class of 18 students. The 5th graders of Çağış Primary School in Balıkesir constituted the research context. The participant children were given pastel painting sets and asked to paint pictures related to future technology. Before this, they were given information about life in the future or using technology. Images collected from children participating in the study were analyzed using content analysis method. According to the analyses, it was determined that the children focused on more than one future technology topic in their paintings. A great majority of the students used "transportation" and important portion of students used "nature" as future technology themes in their paintings. The rest of the students used "Instruments-Devices" as future technology themes in their pictures.

Keywords: Future technology, pictorial representation, images, art education;

1. Introduction

We are witnessing a century, where information and communication are developing rapidly and technologic products are constantly being renewed. In the 21st century, life is becoming more convenient with the impact of intensely developing technologic products; however, the qualifications we require in

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order to access this convenience are increasing. The basic function of mass communication is to provide solutions for reality based problems while entertaining, to educate, and to assist certain values settling in society. The dazzling developments in IT Technology constantly demonstrate changes for the sustaining of pursuits of humans such as establishing communication, addressing daily needs, correspondence, and forms of work. In the society of today, while young children are becoming acquainted with the computer and using technology effectively, the previous generation is making efforts and taking lessons to overcome this task and a large majority of them can refer to the new generation, which is very acquainted with technology, as being detached from and irrelevant to their roots.

Many social benefits, which technology helps in arising, are balanced day by day with social problems arising from their use. These are problems ranging from the individual being under pressure, the multi-dimensional destruction of nature to the consumption of the world's limited sources. It is undeniable that technology is an integral part of our social world and has become a fundamental element of our daily activities. The need for any type of machine in performing almost all types of works in the social domain is one of the apparent characteristics of modern life. We use machines for travelling, communicating, producing goods, rendering services, and even entertaining each other. It can be said that technology, which facilitates our lives, makes the world smaller, and thus, creates more free time and makes us free and at the same time makes us easily traceable (Turan & Esenoğlu, 2006: 72-74).

In the society of today, children become acquainted with technology, particularly computers, at very early ages. The children and youth of today, who intensely use the computer and internet for assignments and extracurricular activities and entertainment both at home and school, are among the actors that take part the most in the portion requiring communication and interaction of technology in general and computers and internet specifically.When observed in this respect, children are the most prominent factors that use technology in a well manner and shall take it further (Canbek & Sağıroğlu, 2007: 33).

Children of the new generation are born and grow together with computers, the internet, mobile phones, cameras, and other products of the digital world. These children, which are referred to as "digital natives" by Prensky (2001), perceive the world in a different manner, think multi-dimensionally, make decisions faster, and transform technological products to the center of their lives. Computer games, e-mails, the internet, mobile phones, and mobile phone messages have become an integral part of the lives of these students. Studying the perspective of these digital natives, who are each a strong user and consumer of technology of today, is of significance in terms of directing this interest of theirs in a correct manner. In this context, the conducted study was formed in line with paintings of students concerning technology of the future. As a technique pictorial representation, in which they can express schemas envisaged in the minds of students, their emotions and thoughts better, was consulted.

Art and art education is of undeniable significance. The child, who is illiterate and cannot completely express him/herself, reflects him/herself and his/her inner world through his/her first doodles. This unconscious shapes and scribbles are replaced with conscious shapes with art education (Şişginoğlu, 2007). Humans are born with the competence of making sense of and interpreting the world, in which they live in. When this competence is supported under suitable conditions and environments, each individual interprets and expresses the world and itself in various manners. Just like each individual living in society, children too have the need to express themselves. In teaching settings, one of the most effective means for students expressing themselves is pictorial representation (Acer & İlhan, 2011). In addition to pictures being criteria useful for introducing the child to us in psycho-pedagogic terms, it is also of great significance in that it is an instrument of expression useful for reflecting the child's intelligence, personality, intermediate surrounding characteristics, and inner world (Yavuzer, 2007: 12). With the pictures they have sketched, students are able to express their emotions and thoughts through lines, forms, and colors and are able to demonstrate their thoughts on the future in a more comfortable manner.

When the literature is examined, it can be observed that studies addressing children's paintings demonstrate diversity.   Image of scientists (Türkmen, 2008), image of mathematicians (Picker & Berry, 2000), perception of the concept of health (Rijey & Van Rooy, 2007), environmental issues (Sadık, Çakan

& Artut, 2011), perception of technology (Erişti & Kurt, 2011), perceptions of the internet (Esgi & Çevik, 2010), perception of popular culture (Erişti, 2010) and perception of the European Union (Belet & Türkkan, 2007) are among subjects discussed in studies conducted with primary school students.

The overall objective of this study is to examine the perception of future technology of students in the fifth year of primary school through paintings they have painted. Based on this overall objective, answers to the questions of "What are the opinions of primary school students on the concept of technology?" and "How do primary school students reflect their perception of future technology in their paintings?" have been sought in this study.

2. Method

This study is a qualitative study examining the form of future technology perception of children in the 11-12 year old age group through paintings they have painted. The universe of the study consists of 18 students studying in Class A of the 5th Grade at the primary school in the Çağış Village in the province of Balıkesir during the 2011-2012 academic year. Data was collected in the spring semester of the 2011-2012 academic year. Primarily, brain storming was carried out under the guidance of the researchers with the students concerning the use of future technology. Open ended questions were directed at the students and then they were requested to express their emotions and thoughts on future technology through paintings. The students painted their paintings with pastel paint on paper handed out by the researchers for one period. Each student wrote their name, surname, and a brief description of their painting on the back of the paining paper. Whilst the students were painting, the researchers and class teacher remained in the classroom.

The overall objective of this study is to examine the perception of future technology of students in the fifth year of primary school through paintings they have painted. Based on this overall objective, in the study the answers to the following questions have been sought:
1. What are the opinions of primary school students on the concept of technology?
2. How do primary school students reflect their perception of future technology in their paintings?

3. Analysis and Interpretation of Data

Data obtained from the pictorial expression of students and their discussed opinions have been analyzed and interpreted through descriptive analysis. In the analysis stage of the data, paintings painted by the students and their answers to open ended questions have been analyzed by researchers. As a result of these analyses, the themes appearing in the expressions of students based on the concept of technology have been gathered under the three titles of "benefits, characteristics, and definition of technology." Afterwards, these main themes have been separated into sub-themes. These are 1. Benefits of Technology; a) Making life easier, b) Usefulness, c) Problem solving, 2. Characteristics of technology; a) Entertaining, b) Pleasing, c) Sustainable; 3. Definition of technology; a) Invention, b)Power, c)Instrument.

The themes of opinions developed by students with regards to future technology are present in the following figure in the form of main themes and sub-themes.
1. Change of Nature; a) Magic Seeds, b) Growing Food, c) Ever-lasting Drinks, d) Clean Environment, e) Polluted World; 2. Future Architecture; a) Rising Homes, b) Homes with Geometric Shapes, 3. Transportation; a) Flying cars, b) Flying People, c) Flying Homes, d) Walking homes, e) Space Vehicles; 4. Instruments-devices; a) Walking ball, b) Magic Pen, c) Living Television, d) Change Controller, e) Robots, f) Cloning Machine.

Table 1. Opinions of Students on the Concept of Technology (N=18)

Themes	Sub Themes	Opinion No	Frequency
Benefits of Technology	Making life easier	17,16,15,14,13,10,8,7,4, 3,2,1,6,18	14
	Usefulness	15	1
	Problem Solving	7	1
Characteristics of Technology	Entertaining	15	1
	Pleasing	10,8,18	3
	Sustainability	8	1
Definition of Technology	Invention	14,13,11	3
	Power	12	1
	Instrument	9,8,5,4,2,1	6

As it can be observed in Table 1, answers to the question of "In your opinion, what is technology?" directed to the participants, is in three different categories. Accordingly, there are a total of 16 opinions expressing the benefits of technology. A total of 5 opinions on the characteristics of technology and 10 opinions emphasizing its definition have been discussed. Among all participants, 14 expressed the concept of technology as "making life easier", 6 participants expressed technology as an "instrument." Below there are samples of student opinions on technology.

Opinion 7: In my opinion, technology produces solutions making life easier and finds solutions to some causes.
Opinion 8: In my opinion, technology is an instrument required to make our lives easier. Technology is a very nice thing and is something that never finishes and increases as the years pass.
Opinion 12: Technology means power to me.
Opinion 13: Inventions in the future are called technology.

Table 2. The Perception of Future Technology in the Paintings of Students (N=18)

Themes	Sub Themes	Painting No	Frequency
Change of Nature	Magic Seeds	1	1
	Growing Food	5,18	2
	Ever-lasting Drinks	7,18	2
	Clean Environment	13,16	2
	Polluted World	9	1
Future Architecture	Rising Homes	3,8	2
	Homes with Geometric Shapes	13,17,11,5	3
Transportation	Flying cars	6,10,	2
	Space Vehicles	11,12	2
	People	18,10,6	3
	Walking homes	10,16,17	3
	Flying Homes	8,10	2
Instruments-Devices	Walking ball	13	1
	Magic Pen	14	1
	Living Television	15	1
	Robots	10,8	2
	Change Controller	4	1
	Cloning Machine	2	1

As it can be observed in Table 2, the paintings painted as a response to the question of "In your opinion, how should future technology be?" directed to the students have been grouped in 4 categories. These themes have been discussed under the titles of the change of nature, future architecture, transportation, and instruments-devices. In 8 of the student paintings there are pictorial expressions of changes in the future resulting from the change of nature, and in 5 of them the architectural change of the

future was dealt with. In 12 paintings on transportation of the future there are different figures and the total of pictorial expressions with technological instruments of the future have been determined as 7.

4. Finding and Interpretation

4.1. Change of Nature

Fig.1. (a) painting no 18; (b) painting no 5

Painting No 18:
It is a painting expressing that roles in life changed in the future. In the painting it can be seen that humans travel by flying and they have wings as parts of their bodies. With regards to this painting, the student has used the following expression:
"In my opinion, in future technology, humans fly in the sky. I imagined it like this. Flowers and fruits are larger and we eat them and they never finish. I would really like to live in such a world."

Painting No 5:
In the painting in the sub theme titled growing fruits there are samples of bean and tomato figures in relation to the change of nature in the future. At the same time, the "tomato house" figure in this painting also reflects the creative ideas of the individual regarding future architecture. The student has used the following expressions with regards to this painting:
"In my painting there is a tree of beans, house of tomatoes, and a glove made from a broom.
Tree of beans: The beans on it are edible and medicine can be made from them.
House of Tomato: It has windows in the form of waves.
Gloves made from a broom: when sweeping, it will be like as if you had a hand."
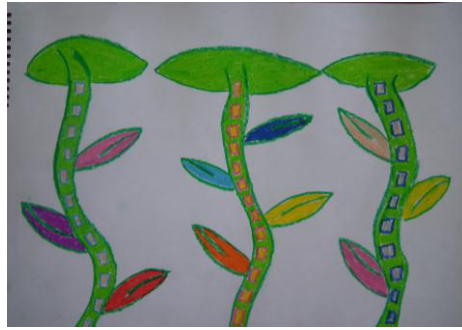
4.2. Future Architecture

Fig. 2. (a) painting no 13; (b) painting no 3

Painting No 13:
These homes, which were depicted by the student with triangles and various geometric shapes under the future architecture style, were expressed to be "smart homes" by the students. Another striking figure in this painting is a transportation vehicle called the "walking ball", which is believed to be a part of transportation in the future. The student has expressed his/her opinions regarding the painting in the following manner:
"As time and technology advances, humans build their homes in different forms. These homes must definitely address all our needs. They should be smart. They should be able to do whatever we wish. People shall stand on something like a wheel so they do not have to walk. The wheel shall take them around. The shapes of trees are different and people have wanted to make the environment more beautiful. They want to live in a different and more fun place."

Painting No 3:
In this painting, the architecture of the future has been depicted based on "nature." Homes at heights enabling humans to reach the sky have been imagined. The student has expressed his/her opinions regarding the painting in the following manner:
"In this painting there are homes made of beans. These homes reach out to the sky. The tallest one has a leaf garden, rectangular windows, and small leaf stairs. The houses are entered by climbing these stairs. Let's use green paint more. Because I like the color green. I made the leaves colorful, because I imagined it to be like that."

4.3. Transportation

Fig. 3. (a) painting no 10; (b) painting no 17

Painting No 10:
In this painting with dominant airplane, car, house, and human figures, the theme of "transportation" has been determined as the main theme. It can be seen that in a majority of student paintings, there is the theme of "transportation". This demonstrates that students perceive the concept of future technology as flying objects. The student has expressed his/her opinions regarding the painting in the following manner:
"For me, in the future there are walking homes, tall trees, homes on trees, and colorful trees. There is a child, who has put on wings and is flying around. I painted a flying car and robot dog. Those things, which I have painted, are entertaining and comforting everyone and making them happy. In brief, it makes our lives easier"

Painting No 17:
As in painting 10, in painting 17, it can be observed that under the main theme of "Transportation", the sub theme of "walking homes" have been depicted. In this painting, the student personifies the home and has indicated this with a happy facial expression. The birds in the painting are reinforcing this. At the same time, this walking home has been discussed as the concept of "nature" and has been depicted as presenting its products to humans and is glad to do this. The student has expressed his/her opinions regarding the painting in the following manner:
"In this painting, by using geometric shapes for the year 2200 I have painted a house with a triangular top, that produces fruits, has flowers and birds, and those butterflies carry humans."

4.4. Instrument - Devices

Fig. 4. (a) painting no 2; (b) painting no 4

Painting No 2:
In the painting numbered 2 above, in the middle column of the painting paper, which the student has divided into three, the student has depicted a cloning machine and in the columns to the sides, the student has depicted that it is possible to be at different places at the same time after the cloning procedure. Thus, by stating that technology could make human life easier in the future, the student has attempted to explain that there shall not be a case of 'timelessness'. The student has expressed his/her opinions regarding the painting in the following manner:
"In the year 2100 there is cloning. Someone has cloned himself and these clones are going everywhere. That man is resting at home. In other words, this cloning machine handles all our work. In the 1st painting, the clone is going to work and in the 3rd painting it is going out dining with the girlfriend of its owner."

Painting No 4:
In this painting, a "controller" designed for the future is striking. With this controller, humans in the future are able to return to their past state whenever they desire and return back to their previous state. At the same time, a house that has been depicted with geometric shapes has been formed by considering a human face. Again, this can be an example of homes being personified.
The student has expressed his/her opinions regarding the painting in the following manner:
"I painted this painting because people are playing games and they want to show themselves sometimes as giants and sometimes as dwarfs. But in the year 2100, they are able to make themselves giants or dwarfs with a single controller. And they are able to go to one of their past states. If they wish, they are able to pass from their babyhood to their childhood. In the year 2100 the sun shall come alive and clouds shall have geometric shapes. The stump and leaves of trees are in the shape of triangles. There is a home and the bottom floor of this house is normal and its top floor is in the form of a human."

5. Conclusion and Suggestions

Students expressed their views on the concept of technology as the benefits of technology, the qualities of technology, and its definition in their written expressions; however, they associated the concept of technology with concepts such as computers, phones, projectors, radios, cell phones, and internet in their verbal expressions prior to their written expressions.

During the interviews conducted with the students before the painting session, in addition to the concepts they reflected in their drawings in the brainstorming activity regarding the technology of the future they also expressed themselves in the following creative activities: Robots working instead of humans so humans do not get tired, a device used for storing the information in the memory without ever having to attend school, houses in the shape of a body of water to avoid water shortage in the future, roller coasters like in amusement parks and special vehicles fitted for them. GPRS in the shape of spectacles, folding pocket-sized houses and computers, a teleportation device, changing the color of the paper to the requested color at one touch with an electronic pencil during painting, a device that creates an abundance of food and water in an arid region when it is in contact with the soil, appearing bars of chocolate when the word chocolate is written on paper with an electronic pen. Above all, greater emphasis given by the students is a machine they designed depending on the concept of "time." The reasons for requiring such a device in the future are stated as follows: 1. Immortality of humans 2. Return to childhood period whenever they wish 3. Repair mistakes 4.Having the power to see the future whenever they wish 5. Changing the current conditions (for example: To experience the summer time instead of winter time).

Despite the wide-variety of students' verbal expressions in the research, due to the limited time and the space of the drawing paper, they have been able to reflect their imaginations on the papers to a small extent. In students' expressions of future technology the reflection of visual media and internet used for games and learning purposes as well as their level of preparedness on their drawing papers is inevitable. Considering that this research is performed in a village primary education school, the traces of versatile and creative thinking of new generation students in their views on technology are observed. In addition, in the examples regarding future technology the element that draws attention deals with the positive functions of technology as a means of obtaining things that are requested as well as providing entertainment and amenities. Students have never mentioned the abuse of technology in the future or its adverse effects.

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