Perceptions of secondary school 8th grade students regarding smart board concept

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Abstract

Technological developments are rapidly becoming widespread especially in developing countries. Educational institutions have also been affected by technological developments. One of the educational technologies which became popular recently is Smart Board (SB). The aim of this study is to determine 8th grade students' mental images of "SB" concept through metaphors. For this purpose, the students studying at 8th grade of a secondary school were asked to complete the sentence of "SB is like…Because…". Phenomenological research design was used in the axis of qualitative research approach and the data were collected through metaphors in the study. 86 students studying at 8th grade formed the population group of the study. The data of the study were reviewed for content analysis. The metaphors which are not valid were excluded. Then, raw data were formed by transferring these metaphors and their descriptions to computer environment. The metaphors with similar characteristics in these texts were grouped into 5 conceptual categories. According to the research findings, the participants produced 36 valid metaphors. According to the results of study, it was found out that the participants had positive concepts about "SB". Some participants were found to perceive SB as an unnecessary, boring and constantly deteriorating tool.

Keywords: Smart Board; metaphor; student; perception; 8th grade

1. Introduction

1.1. Literature review

It becomes necessary to renew or update educational programs and teaching materials every year as a result of major developments in science and technology in our age of information (Yeşilyurt, 2007). The ever-changing world order and innovations in teaching materials, some new needs that emerged in the teaching learning processes also forced learning environments to innovation. Existing learning

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environments needed to renew themselves with developing knowledge and technology (Yüce, 2019). For this reason, it became obvious that new generation learning environments should consist of environments that can appeal to multiple senses of students and make learning concrete and understandable. As a result of these needs, blackboards, one of the most important learning materials used in schools, left its place to smart (interactive) whiteboards.

Smart Board (SB) has been introduced to many schools for use of technology in formal education institutions within the scope of Movement of Enhancing Opportunities and Improving Technology (FATİH) in Turkey. Effective use of technology in education and training was aimed with FATİH project, whose piloting study was initiated at 5th and 9th grades of 4 primary schools and 48 secondary schools, 52 schools in total, in 2012 (Pamuk, Çakır, Ergun & Ayas, 2013).

Students, who use SB and multimedia activities together, can make positive contribution to their own learning by encountering an enriched learning environment. Therefore, learning environments need to be organized in accordance with multimedia activities. SBs installed in classrooms as a result of developments since 2012 have turned learning environments into interactive places with their facilities. Also, abstract subjects can become concrete and subjects can become more understandable with content organizing at EBA portal. SBs are among indispensable course materials of classroom environments with both easy accessibility and many features (Yalap & Yılmaz, 2017). Also, Fidan (2018) draws attention to the conscious use of technological devices such as computers and smart phones by students.

Our mental perceptions, concepts regarding objects or anything are related to the concept of metaphor. Because what we think about concepts, what sort of belief and value we have, emerge in our daily actions, behaviors and reactions. Metaphors are outside reflections of mind. What we react and what opinions we have about any image are hidden in the content of the metaphors. For this reason, students' perceptions should be checked frequently by using metaphor techniques in education administrations and possible misperceptions should be corrected in the process.

As a concept, metaphor is a powerful mental tool that an individual can use to comprehend an abstract and difficult to understand phenomenon (Afacan, 2011). Metaphors enable a similarity relationship between newly learned things and previously learned knowledge. Concrete information is stored in memory with the help of this similarity relationship (Gün, 2015). The essence of metaphor is to understand and experience one thing from another's perspective (Lakoff & Johnson, 1980). We can memorize the things we want to learn or keep in mind with the help of any object through metaphors. Abstract and hard to learn subjects can be concrete and easy through metaphors in this way.

Metaphor is a mentally powerful model, because a certain mental scheme is reflected on another mental scheme by establishing a relationship between two unrelated phenomena by means of metaphor. Metaphors enable an individual's mind move from one particular understanding to another in this way (Saban, 2008). Metaphor as a word derives from the combination of two Greek words of "meta" (change) and "pherein" (convey) (Levine, 2005). Metaphor, corresponding words such as simile and figurative expression in Turkish, is one of the popular data collection tools in qualitative research studies recently. Metaphors are used in various levels of education. Metaphors are referenced in curriculum development and planning, promoting learning and developing critical thinking in educational management. Metaphors can be regarded as defining instruments in directing teaching applications and teachers' places in modern education understanding in teacher training (Vadeboncoeur & Torres, 2003).

1.2. Research questions

The aim of this study is to reveal the perceptions of 8th grade students concerning SB through metaphors. Following questions were answered in line with the purpose of this study:

•   What kind of metaphors did the secondary school 8th grade students use to identify the concept of "SB" with?

•   How do the secondary school 8th grade students describe the metaphors that they identify with the concept of "SB"?

•   Which conceptual categories are the metaphors that were defined by the secondary school 8th grade students divided in terms of common features?

2. Method

2.1. Research design

This study was designed as a qualitative one and the researchers followed a phenomenological approach. The phenomenological inquiry focuses on cases that we are aware but we do not have in-depth and detailed understanding. Phenomena can be encountered in various ways such as experiences, events, situations, orientations, concepts, perceptions or participating in a program (Creswell, 2007; Patton, 2002). Phenomenology provides an appropriate research base for studies that not only are completely different for us, but also aim to investigate cases that we do not fully understand (Yıldırım & Şimşek, 2005).

The concept of "like" is used to associate clearly the relationship between "subject of the metaphor" and "source of the metaphor" in studies where metaphor is used as a research (Saban, 2009). Metaphors allow us to "know" as means of understanding nature and environment and making senses from irrelevant real objects (Yıldırım & Şimşek, 2005).

2.2. Participants

The study group of this study consists of 8th grade students of Atatürk Secondary School in Yahyalı district of Kayseri. The students voluntarily participated in the study. The distribution of the participants by sex is as follows:

Table 1. Features of the Participants

Sex	f	%
Female	52	60,5
Male	34	39,5
Total	86	100

As can be seen from Table 1, there were 52 female participants and 34 male participants. There were 86 students in total participated in the study. The proportion of female students is higher than that of male students.

2.3. Data collection procedure

The data were collected from the students studying at 8th grade in the Atatürk Secondary School in Yahyalı district of Kayseri in 2015-2016 Academic Year. Metaphors were explained to the students, then, they were asked to complete the papers on which the expression of "Smart Board is like…, because…" was written. The information regarding purpose of the study and where the data would be used were explained on the directions section of the paper. The students were asked to describe the SB by focusing on a particular metaphor in 25 minutes.

2.4. Data analysis

Content analysis technique was employed to analyze the data. Content analysis aims to reach relationships and concepts to explain collected data. Content analysis processes data in a more detailed way, and themes and concepts that cannot be realized by descriptive analysis can be revealed through content analysis (Yıldırım & Şimşek, 2005). The steps suggested by Aydın and Ünaldı (2010) and Saban (2008) were followed in the content analysis, and these are 1) naming stage, 2) classifying and clarifying stage, 3) collection and categorization development stage, 4) validity and reliability stage, 5) transferring the data to the computer stage.

The criterion was whether the students can produce metaphors regarding the "SB" in the study in which the mental conceptions of the students studying at 8th grade secondary school were investigated. Then, the papers collected from students were numbered according to the students' order of delivery. 86 working papers of the participants were subjected to grading and refining. Some of the students wrote their thoughts regarding SB, while others did not produce any metaphors. As a result, 5 metaphors were excluded from the research, and 36 valid metaphors were taken into consideration.

The materials produced by the participants are listed in alphabetical order at collection and categorization stage. Then, sample metaphor expressions representing the metaphor were chosen. The metaphors produced by the students were examined in terms of common characteristics and the resulting metaphors were divided into 5 groups.

In the validity and reliability stage, the focus was on validity and reliability of the processes. Validity and reliability are important in terms of scientific value. Reporting the collected data in a detailed way and explaining how the research results are achieved are among important criteria of validity in a qualitative research (Yıldırım & Şimşek, 2005). The data were transferred to a computer at reliability stage, and two lists including the data were given two experts and they were requested to match these two lists in order to enhance reliability of the study. The metaphors of participants regarding the concept of "SB" are categorized in tables. Metaphors divided into categories are given in participant numbers (f) and percentages (%) with some of the student descriptions, and the data in tables were interpreted.

3. Results

Table 2 and Table 3 show the positive and negative perceptions of the 8th grade students about the concept of "SB".

Table 2. Positive Perceptions of Secondary School 8th Grade Students Regarding the Concept of "SB"

Category	Code	Metaphor	Participants		Sum of Codes	
			f	%	f	%
Positive metaphor	10	Miracle	1	1,23		
	44	A burning lighter	1	1,23		
	13	Education nest	1	1,23		
	40	Book	9	11,11		
	81	Time evaluator	1	1,23		
	60	A book we didn't bring	2	2,46		

Code	Metaphor	f	%		
46	Telephone	2	2,46		
5	World	1	1,23		
45	Brain	1	1,23		
16	Treasure not found	1	1,23		
32	Time machine	2	2,46		
40	Encyclopedia	4	4,93		
55	Information box	6	7,40		
2	Teacher	15	18,5	25	86.42
79	Library	4	4,93		
31	Jet	2	2,46		
49	A garden	1	1,23		
4	A part of life	1	1,23		
17	Greengrocer	1	1,23		
76	Cinema	3	3,70		
42	Music box	4	4,93		
73	Candy	1	1,23		
19	Dream	1	1.23		
33	Game	3	3.70		
57	Television	2	2.46		

Table 3. Negative Perceptions of Secondary School 8th Grade Students Regarding the Concept of "SB"

Category	Code	Metaphor	Participants		Sum of Codes	
			f	%	f	%
Negative metaphors	59	Prison	1	1.23		
	77	Inaccessible thing	1	1.23		
	52	Forbidden ware	1	1.23		
	6	A balloon in the box	1	1.23		
	8	Inaccessible blessing	1	1.23		
	23	Inaccessible information	1	1.23	11	13.57
	26	Jewel	1	1.23		
	78	Turtle	1	1.23		
	37	Cigarette	1	1.23		
	3	Brainwashing tool	1	1.23		
	7	Family ties	1	1.23		

According to the data in Table 2 and Table 3, 86.42 % of the metaphors formed by the participants are positive and 13.574 % are negative. 70 participants produced 25 positive metaphors. 11 participants produced 11 negative metaphors. The participants associated the SB with miracle, a burning lighter,

education nest, book, time evaluator, a book we didn't bring, telephone, world, brain, treasure not found, time machine, encyclopedia, information box, teacher, library, jet, a garden, a part of life, greengrocer, cinema, music box, candy, dream, game and television.

13,57% of the participants developed negative attitude towards SB. The participants associated the SB with prison, inaccessible thing, forbidden ware, a balloon in the box, inaccessible blessing, inaccessible information, jewel, turtle, cigarette, brainwashing tool and family ties. When the explanations of the negative perceptions of the participants towards the SB were examined, the participants generally complained about the easy deterioration of smart board and inability to connect to video-watching sites such as YouTube.

The metaphors developed by the participants for the concept of "SB" are; SB as tutorial and information source, SB as a tool to help you learn, SB as an assistant tool to help you learn, SB as a forbidden and inaccessible tool, SB as a source of happiness and entertainment and SB as an unnecessary tool. Table 4, Table 5, Table 6, Table 7 and Table 8 present the metaphors produced by 8th grade students, description of metaphors, number of participants (f), percentage (%) and categorical distribution of metaphors.

Firstly, the category of 'SB as tutorial and information source' had a proportion of 37,03% among the metaphors categorized into categories according to Table 4. Participants compared SB to the teacher in the category of 'SB as tutorial and information source'. Participants compared SB to the teacher and the information box in the category of 'SB as tutorial and information source'. In this category, SB was associated with metaphors such as teacher, jet, greengrocer, part of life, information box, library and a garden. The features of SB such as teacher, library, guide for students and lectures are emphasized. 'SB as an assistant tool to help you learn' category is the one that the participants most cared about. This can be considered as the participants have positive thoughts towards SB and they think SB is useful.

Table 4. Categorical Distribution of Metaphoric Perceptions of Secondary School 8th Grade Students Regarding the Concept of SB

Cate.	Code	Metaphor	Sample Explanations from the Participants	f	%	f	%
SB as tutorial and information transmitter	55	Information box	SB is like an information box. Because it gives information and illuminates us.	6	7,40		
	2	Teacher	SB is like a teacher. Because, it delivers lessons like a teacher.	15	18,51		
	79	Library	SB is like a library. Because we study and learn our lessons on it.	4	4,93		
	31	Jet	SB is like a jet. Because, whenever we open it, we get information with jet speed.	2	2,46	30	37,03
	49	A garden	SB is like a garden. Because, we eat fruit called information through Smart Board.	1	1,23		

| | 4 | A part of life | SB is like a part of life. Because, it is a kind of board that helps everything in life. | 1 | 1,23 | | |
| | 17 | Greengrocer | SB is like a grocery store. Because, it has every kind of fruit you look for. | 1 | 1,23 | | |

Secondly, 'SB as an assistant tool to help you learn' category got 32,09 % according to Table 5. The participants associated SB with book, smart phone, burning lighter, miracle, world and brain. The category of 'SB as an assistant tool to help you learn' is considered as a metaphor of which they can study on when they do not bring books, manage time effectively and enables to access every sort of information when necessary by the participants. As it is understood from the data, the participants saw this category as a useful tool for accessing information.

Table 5. Categorical Distribution of Metaphoric Perceptions of Secondary School 8th Grade Students Regarding the Concept of SB

Cate.	Code	Metaphor	Sample Explanations from the Participants	f	%	f	%
	10	Miracle	We learn from SB. We study on it.	1	1,23		
	44	A burning lighter	SB is like a burning lighter. Because, it brightens our way.	1	1,23		
	13	Education nest	SB is like an education nest. Whenever we open it, information blows.	1	1,23		
SB as an assistant tool to help you learn	40	Book	SB is like a book. It helps us in learning.	9	11,1		
	81	Time evaluator	SB is like a time evaluator. Because, we use class time effectively.	1	1,23		
	60	A book we didn't bring	SB is like a book that we don't bring. Because, when we don't bring books, we study on it.	2	2,46	26	32,09
	46	Telephone	SB is like a smart phone. Because it helps us learn at any moment.	2	2,46		
	5	World	SB is like the world. Because we find everything in it.	1	1,23		
	45	Brain	SB is like a brain. Because, we get every sort of information.	1	1,23		
	16	Treasure not found	It's like a treasure that has not been discovered yet. Because it allows us to find everything immediately.	1	1,23		

	32	Time machine	SB is like a time machine. Because it allows us to find both old and new information.	2	2,46		
	40	Encyclopedia	SB is like an encyclopedia. Because we find what we look for.	4	4,93		

Thirdly, 'SB as a source of happiness and entertainment' takes the 3rd place with 17, 28% among the categorized metaphors according to Table 6. The participants associated this category with candy, cinema, music box, dream, play and television. The concept of SB is considered as a tool which is funny and playable, gives happiness, enables to watch movies and listen to music. At this category, they considered SB in a positive way.

Table 6. Categorical Distribution of Metaphoric Perceptions of Secondary School 8th Grade Students Regarding the Concept of SB

Cate.	Code	Metaphor	Sample Explanations from the Participants	f	%	f	%
SB as a source of happiness and entertainment	73	Cinema	SB is like a cinema. Because, we watch movies on it and we have a lot of fun.	1	1,23		
	76	Music box	SB is like a music box. Because, we listen to music from SB and have fun while listening to music.	3	3,70		
	42	Candy	SB is like a candy. Smart Board both entertains and gives happiness as candy makes people happy.	4	4,93		
	19	Dream	SB is like a dream. Because, no one could think of such a thing many years ago. Thanks to SB, we realize our dreams and become happy.	1	1,23	14	17,28
	33	Game	SB is like a game. Because, we can play games with it. Thanks to the games we have a lot of fun.	3	3,70		
	57	Television	SB is like television. Because whenever we want, we can watch many things such as movies, documentaries and animation from smart board in the classroom.	2	2,46		

Fourthly, the category of "SB as a forbidden and inaccessible tool" was at the 4th place with 8,64% according to Table 7. They associated SB with prison, an inaccessible thing, a forbidden ware, a balloon in the box and jewel. SB was considered as a tool which is inaccessible, permanently locked, not connecting many network addresses and running at a very slow speed. The participants developed negative metaphors towards SB at this category due to the fact that these boards are kept locked after lessons.

Table 7. Categorical Distribution of Metaphoric Perceptions of Secondary School 8ᵗʰ Grade Students Regarding the Concept of SB

Cate.	Code	Metaphor	Sample Explanations from the Participants	f	%	f	%
SB as a forbidden and inaccessible tool	59	Prison	SB is like a prison. Because it's locked whenever we need it	1	1,23		
	77	Inaccessible thing	SB is like an unreachable thing. Because, it is locked whenever we try to reach it.	1	1,23		
	52	Forbidden ware	SB is like a forbidden item. Because, the teachers don't want us to touch Smart Board.	1	1,23		
	6	A balloon in the box	SB is like a balloon inside a wooden box. Because when we try to reach, it is always locked and closed.	1	1,23		
	8	Inaccessible blessing	SB is like an inaccessible blessing. Because, when we try to watch videos from the internet, we can't access video-watching sites like YouTube.	1	1,23	7	8,64
	23	Inaccessible information	SB is like inaccessible information. Because there are no other users apart from teachers.	1	1,23		
	26	Jewel	SB is like jewel. Just as we can't reach the jewel, we can't reach it because it is forbidden.	1	1,23		

Lastly, the most striking aspect in the analysis of the data of the study was that the participants see the smart board as an unnecessary tool according to Table 8. They associated SB with turtle, cigarette, brainwashing tool and family ties at this category. They considered Smart Board as an unnecessary tool, an addictive object, unnecessary as it is easily broken and boring. At this category, the participants developed negative attitudes towards SB.

Table 8. Categorical Distribution of Metaphoric Perceptions of Secondary School 8th Grade Students Regarding the Concept of SB

Cate.	Code	Metaphor	Sample Explanations from the Participants	f	%	f	%
SB as an unnecessary tool	78	Turtle	SB is like a turtle. It is unnecessary as it proceeds very slowly.	1	1,23		
	37	Cigarette	SB is like a human being addicted to smoking. When used too much, it becomes an addiction. For this reason, it is unnecessary.	1	1,23		
	3	Brainwashing tool	SB is like a brainwashing tool. Because it occupies people's brains.	1	1,23	4	4,93
	7	Family ties	SB is like family ties. As we use it, we become dependent on it.	1	1,23		

4. Discussion

SBs are the leading technologies used in the classrooms with the reflection of technological developments in education. Balkaş and Barış (2015) investigated the effects of SB on teacher roles, classroom management, classroom interaction and student motivation. They found out that SB helps teachers to extend their roles out of traditional ways and helps them to conduct more efficient processes in courses.

When the literature is reviewed, it is seen that there are many mental perception studies on SB concept especially in our country. One of the studies in this area was conducted by Aktürk, Mıhçı and Çelik (2014). High school students' perceptions about SB were determined in the study titled metaphors of high school students about the concept of SB. The study showed that 78.3% of the students developed positive attitude towards SB. Moreover, Altınçelik (2009) concluded that teaching becomes concrete through the easy use of audiovisual materials and learning becomes permanent by the help of SBs.

5. Conclusions

The participants developed 36 different metaphors in this study in which secondary school 8th grade students' perceptions of SB used in schools within the scope of FATİH project were determined through metaphors. The results showed that 25 metaphors were positive and 11 metaphors were negative. When the metaphors were analyzed, it was seen that students' perceptions about SB were positive in general. While 86.41% of the students developed a positive attitude towards SB; 13,58% of them have developed a negative attitude.

The students developed positive attitude towards SB at the categories of SB as tutorial and information source, SB as an assistant tool to help you learn and SB as a source of happiness and entertainment; while they produced negative metaphors towards SBs at the categories of SB as a forbidden and inaccessible tool, and SB as an unnecessary tool.

Based on the results, several suggestions can be provided. Firstly, some participants developed negative attitudes towards the concept of SB. From this point of view, the studies can be designed to help students develop positive attitudes towards the benefits of technology. Secondly, studies can be conducted on student roles in educational models that are presented with technology. Thirdly, studies and activities can be carried out for the effective use of SB in the courses. Lastly, research studies can be planned on how to integrate educational technologies such as SB into teaching environments.

6. Ethics Committee Approval

The authors confirm that this study does not need ethics committee approval. (Date of Confirmation: 16.03.2020)

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Ortaokul 8. sınıf öğrencilerinin akıllı tahta kavramına ilişkin algıları

Öz

Teknolojik gelişmeler özellikle gelişmekte olan ülkelerde hızla yaygınlaşmaktadır. Eğitim kurumları da teknolojik gelişmelerden nasibini almıştır. Son dönemlerde yaygınlaşan eğitim teknolojilerinden biri de akıllı tahtadır. Bu araştırmanın amacı, ortaokul 8. Sınıf öğrencilerinin "Akıllı Tahta" kavramına ilişkin sahip oldukları zihinsel imgeleri benzetimler aracılığıyla belirlemektir. Bu amaçla 8. Sınıfta okuyan öğrencilerden "Akıllı Tahta… gibidir. Çünkü…" cümlesini tamamlamaları istenmiştir. Araştırmada nitel araştırma yaklaşımı ekseninde olgubilim araştırma deseni kullanılmış ve incelenecek veriler benzetimler yoluyla toplanmıştır. Araştırmanın çalışma grubunu, 8. Sınıfta öğrenim gören 86 öğrenci oluşturmaktadır. Araştırmanın verileri içerik analizi yapılmak üzere gözden geçirilmiştir. Geçerli olmayan benzetimler ise ayıklanmıştır. Daha sonra bu benzetimler ve benzetimlerin açıklamaları bilgisayar ortamına aktarılarak ham veriler oluşturulmuştur. Bu metinlerde benzer özellik taşıyan benzetimler 5 kavramsal kategori etrafında toplanmıştır. Araştırma bulgularına göre katılımcılar 36 geçerli benzetim üretmiştir. Araştırma sonuçlarına göre katılımcıların "Akıllı Tahta" hakkında olumlu kavramlara sahip oldukları ortaya çıkmıştır. Bazı katılımcıların ise akıllı tahtayı gereksiz, sıkıcı ve sürekli bozulan bir araç olarak algıladıkları görülmüştür.

Anahtar sözcükler: Akıllı Tahta; benzetim; öğrenci; algı; 8. sınıf

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