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## Metaphors of High School Students about the Concept of “Interactive Whiteboard”

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### Abstract

The primary aim of this phenomenographic study is to discover the perceptions of high school students regarding the concept of “Interactive Whiteboard” through metaphors. Phenomenography, which is a qualitative research method, was used in the study. The research group of the study consisted of a total of 162 students studying at the 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup> and 12<sup>th</sup> grades of the information technologies department of an Anatolian high school of commerce. In order to collect the research data, each student in the research group was asked to complete the gaps in the sentence “Interactive Whiteboard is like...; because...” Content analysis techniques were employed for the analysis of the data in order to group the metaphors created by the students based on their common features. As the result of the analysis of the collected data, it was found out that the participants created 41 valid metaphors. These metaphors were classified under 6 conceptual categories in terms of their characteristics. In conclusion, it was determined that the students had highly positive perceptions about “Interactive Whiteboard”. However, it was observed that some of the students perceived “Interactive Whiteboard” as an unnecessary device.

**Key words:** FATIİH Project, Interactive Whiteboard, Metaphor, Perception of Interactive Whiteboard.

### Introduction

The comprehensive developments in science and technology have made it inevitable for the societies to keep up with change with all their institutions. It is necessary to design today’s education institutions which aim to train qualified individuals that can keep up with the information age in a way that can respond to change in the fastest way. The way for achieving this is through the integration of technology in educational environments (Ertmer, 1999; Ertmer, 2005; Harris, Mishra, & Koehler, 2009; Pierson, 2001). Computers, interactive whiteboards (IWBs), tablet PCs, digital projectors, video editing systems, software programs, teaching machines, computer assisted instruction (CAI), intelligent tutorial systems and of course the World Wide Web are the primary contemporary technologies that need to be integrated in educational environments (Francis, 2011; Genesi, 2009).

Discussions that have been ongoing for years on the effects of media devices on learning (Clark, 1983; Kozma, 1991; Lim, 2011) have now gained a new dimension with the educational use of IWBs. The British Educational Communications and Technology Agency (BECTA) (as cited in Hall & Higgins, 2005, p. 104) provides a clear outline of what an IWB is: “An interactive whiteboard is a large, touch-sensitive board which is connected to a digital projector and a computer. The projector displays the image from the computer screen on the board. The computer can then be controlled by touching the board, either directly or with a special pen”. In new generation IWBs, however, the surface of the board is scanned via electronic eyes and every touch of the hand on the board is precisely detected. Thus, the board functions virtually like a tablet PC or a touchpad computer. The interactive nature of the screen of the board provides the student and the teacher an opportunity to interfere with the tasks carried out on the board and thus gives a chance to make changes during the class and provides the feature of saving these changes (Erduran & Tatarođlu, 2009).

In recent years, massive investments have been made in information and communication technologies (ICTs) and the use of IWBs for the integration of technology in education is becoming gradually popular around the world. It is seen that many developed countries such as Britain, US, Canada and Australia have been making

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large investments in IWBs within the scope of the use of technology in education (Hall & Higgins, 2005; Slay, Siebörger, & Hodgkinson-Williams, 2008; Wood & Ashfield, 2008). For example, the government of the United Kingdom has invested huge amounts of money in ICTs in the education sector, including IWBs, “in the belief that their use in the educative process will raise attainment among British schoolchildren” (Hall & Higgins, 2005, p. 102). Developing countries like Turkey also make similar investments with the aim of increasing the success of students (Somyürek, Atasoy, & Özdemir, 2009). For example, ICTs classrooms were established at schools in Turkey within the scope of Basic Education Project Phase I and Basic Education Project Phase II between the years of 1998-2007. In this context, the Ministry of National Education established 7100 ICTs classrooms in approximately 5800 schools across the country in order to improve the quality of education (Özdemir & Kılıç, 2007; Pamuk, Çakır, Ergun, Yılmaz, & Ayas, 2013). These classrooms are equipped with computers, projection devices and multimedia devices. Afterwards, in 2011 General Directorate of Innovation and Educational Technologies was founded within the body of the Ministry of National Education in order to carry out the projects regarding technology supported education (MEB, 2011). In 2012, the pilot study of Movement of Enhancing Opportunities and Improving Technology (FATİH) Project was started by the Ministry of Education in the fifth and ninth grades of a total of 52 schools, including 4 primary and 48 secondary education institutions (MEB, 2013). With FATİH project, it is aimed to maintain the integration of the ICTs of our day in schools across Turkey. One of the most important steps of this project is equipping all the classrooms of the schools in Turkey with advanced IWB technologies.

Despite the increasing interest in their educational use in recent years, relatively few studies have been conducted on IWBs. While some of these studies focused on the use of IWBs in certain subject areas (Ateş, 2010; Glover, Miller, Averis, & Door, 2007; Merrett & Edwards, 2005; Schmid, 2006; Wood & Ashfield, 2008), some others focused on the views of teachers regarding IWBs (John, 2005; Loveless, 2003; Somyürek, Atasoy, & Özdemir, 2009; Türel, Johnson, 2012) and some others centered upon the views of students on IWBs (Genesi, 2009; Hall & Higgins, 2005; Schut, 2007; Wall, Higgins, & Smith, 2005). For example, in a study conducted by Wall, Higgins and Smith (2005) views of students showed that IWBs enabled the use of various software programs, objectified abstract concepts and rendered the classes more enjoyable. Furthermore, the students who participated in the study stated that they learned easier with the use of IWBs. In a study on the views of primary school students on IWBs, Hall and Higgins (2005) reported that the students who participated in the study stated that IWB use made learning more enjoyable owing to their multimedia capabilities and entertaining features. In the same study, the negative aspects of IWBs were emphasized as technical problems, the insufficiency of students and teachers in terms of communication technologies skills and the students’ lack of access to technology. In a study by Schut (2007), the findings obtained through diaries kept by students and interviews showed that IWBs increased the interest of students in the subject and enriched the classes with certain features such as animation, sound, pictures and games.

In the present study, we endeavored to discover the perceptions of students regarding the IWBs set up at schools within the scope of FATİH project -which is still being executed in Turkey- through metaphors. The main purpose of using metaphors in this study is to reveal the students’ mental images of IWBs and to better understand the views of students on these devices. Metaphors enable the comparison of two events, cases, points or concepts and the presentation of the similarities between these in a figurative way. In this way, a metaphor either attracts attention to the similarities regarding two things or gives us the opportunity to explain one of the two things by substituting the other for the one to be explained (Coşkun, 2010). According to Arslan and Bayrakçı (2006), the use of metaphors maintains the balanced use of right and left brain functions for the development of creative thinking and problem solving skills. A metaphor is a mental tool that an individual can use for understanding and explaining a highly abstract, complex or theoretical concept (Saban, Koçbeker, & Saban, 2006). Metaphors are strong cognitive modelling mechanisms for individuals to analyze and create their own worlds and are generally used for understanding how reality and life are interpreted by the individual (Arslan & Bayrakçı, 2006). In the present study, it was aimed to determine what IWB, which has started to be used in schools within the scope of FATİH project, means for high school students through metaphor analysis.

## Method

Phenomenography is an empirical research method which was developed by Marton (1981, 1986) in the 1980s and has gradually become popular in education research (Erten, Kiray, & Sen-Gumus, 2013; Larsson & Holmström, 2007; Marton & Booth, 1997). The primary aim in phenomenographic studies is to maintain a wider and deeper understanding regarding experiences that are realized but not understood thoroughly and in detail (Yıldırım & Şimşek, 2006). In phenomenographic studies, in which experiences or views of participants regarding the concepts are collected through group interviews, observations, open ended questions, drawings

and dated documents (Marton, 1994), it is generally aimed to discover and interpret individual perceptions regarding a certain phenomenon.

Also in this study, the perceptions stated by high school students regarding IWB are examined through metaphors. The use of metaphors in research studies is highly useful in describing a case, event and phenomenon as it is and presenting a strong and rich illustration of a studied phenomenon, event and case (Yıldırım & Şimşek, 2006). Schmitt (2005) also states that metaphors are highly useful in transforming the complex information gained particularly in qualitative studies into clear and understandable patterns.

### Participants

The participants of this study were 162 students studying at the Information Technologies Department of an Anatolian high school of commerce. The rate and frequency distribution of the students who participated in the study according to their gender and grades are given in Table 1.

Table 1. Rate and frequency distribution of participants according to gender and grade

Variable	Selection	f	%
Gender	Female	74	45.7
	Male	88	54.3
Grade	9	57	35.2
	10	58	35.8
	11	22	13.6
	12	25	15.4
Total		162	100

According to Table 1, 74 of the participants were female and 88 were male students. Furthermore, 57 participants were 9<sup>th</sup> grade students, 58 were 10<sup>th</sup> grade students, 22 were 11<sup>th</sup> grade students and 25 were 12<sup>th</sup> grade students.

### Data Collection Process

In order to determine the perceptions of the participants regarding the concept of 'Interactive Whiteboard', each student in the research group was asked to complete the gaps in the sentence "Interactive Whiteboard is like...; because...". At the beginning of the study, students were provided with the necessary explanations about the metaphors. It was especially emphasized a few times that students had to define 'Interactive whiteboard' in some way and they had to give an explanation for the definitions they made. For this, the students were given a blank sheet which only had an explanation of what they needed to do and the statement "Interactive Whiteboard is like...; because..." at the top. In the explanation section, the students were asked to focus on a single metaphor and write their opinions.

Saban (2009) states that in the studies in which metaphors are used as a research tool, the term 'is like' is generally utilized for reminding the connection between the "subject of the mental image" and the "source of the mental image" more clearly, the term 'because' is used for helping the students present a "reason" (or a "logical basis") for their own metaphors. The students were given 20 minutes to create the metaphors. This time given to students was considered to be enough since the aim was to utilize the first opinions of the students regarding the metaphors. The sentences which the students wrote regarding the concept of 'Interactive Whiteboard' constituted the basic data source of this study. The statement "Interactive Whiteboard is like..." showed what the student associated the 'Interactive whiteboard' with and how he/she perceived the concept and the statement "because..." showed how he expressed his/her perception.

### Data Analysis

Content analysis was used as a technique to analyze the data collected in this study. Yıldırım and Şimşek (2006) state that the basic goal of content analysis is to reach the concepts and connections that can explain the collected data, the data summarized and interpreted through descriptive analysis are subjected to a more extensive process by using content analysis and the concepts and themes that could not be noticed through a descriptive approach could be achieved by using content analysis. The basic procedure of content analysis is to collect corresponding data within the scope of certain concepts and themes and to organize and interpret these data in a way by which the reader can understand (Yıldırım & Şimşek, 2006).

The analysis process and the process through which metaphors were understood by the researchers included the following stages: First, the metaphors created by students were temporarily arranged according to alphabetical order. During the arranging stage, it was checked whether the students clearly indicated the metaphor. Furthermore, the sheets which were empty and those which did not comprise a metaphor were eliminated. It was seen that some students shared their ideas on IWBs rather than indicating a metaphor and some others did not provide an acceptable logical ground although they stated a metaphor. Based on all these, 42 sheets were eliminated and 120 sheets were selected for evaluation.

Finally, the valid metaphors created by the students were reviewed again and arranged according to alphabetical order and then sample metaphor explanations which represented each metaphor were selected. The aim of this selection was to facilitate the grouping of metaphors into categories and to enable the interpretation of the data. Following the selection of sample metaphors, the acceptable metaphors were grouped according to their similarities. The categories were developed according to the metaphors that were grouped with regard to the characteristics of the perception of IWB and the metaphors created by 120 students were divided into 6 groups.

### Reliability and Validity

Validity and reliability are two important criteria to assure the legitimacy of the results of a study. In a well-conducted study, the detailed report of the information and how the researchers obtained the presented results is an important criterion for validity (Yıldırım & Şimsek, 2006). The data collection and data analysis processes were explained in detail in order to establish the validity of the present study. Furthermore, the information obtained from this study was supported with the written statements of the students. To ensure the reliability of the study, the obtained information was analyzed by the researchers of this study. Afterwards, the researchers assembled to compare their analyses. At the same time, an analysis was performed by a different expert in order to see whether the metaphors that existed in the categories formed in the study represented the relevant category. In this regard, the metaphors created by the students and the categories developed by the researchers were presented to the expert in lists. The expert was asked to write the metaphors in the related category and then the groups created by the expert and the researchers were compared. The reliability of the study was determined based on the number of agreements and disagreements that was obtained from the comparison.

Reliability was calculated by using the formula suggested by Miles and Huberman (1994). As the result of the calculation of  $\text{Reliability} = \text{Number of agreements} / (\text{Total number of agreements and disagreements})$ , the reliability of the study was found to be 92%. In qualitative studies, a desired level of reliability is considered to be achieved in cases when the consistency between the assessments of the expert and the researcher is 90% or higher (Eren, Çelik, & Aktürk, 2013; Saban, 2009). The expert who was consulted for the reliability of this study associated 4 metaphors [glass(3), theater(1), computer(5), cheap-jack(1)] with groups different from those formed by the researchers. Thus, reliability was calculated as  $110 / (110 + 10) = 0.92$ . A reliability of 92% was achieved in the present study.

Consequently, 6 categories consisting of a total of 41 metaphors were formed and the metaphors and all the information were entered into SPSS statistics software. Following this procedure, the number of participants (f) and the percentages (%) which represent the 41 metaphors and 6 categories were calculated.

### Results and Findings

The students who participated in this study created 41 valid metaphors about the concept of IWB. There were 30 students who created the metaphor “teacher”, which comprises the majority of the total metaphor frequency. Furthermore, 23 of the metaphors were created by only one student. The number of students that created the remaining 18 metaphors varied between 2 and 30. The metaphors created by the students were classified into 6 general groups (Table 2). These groups were:

1. IWB as an instructive and guiding device,
2. IWB as a device that assists learning,
3. IWB as a source of information,
4. IWB as a source of happiness,
5. IWB as a source of entertainment,
6. IWB as an unnecessary device.

Table 2. Categories of metaphors created by students about the concept of IWB

Categories	Metaphor (Frequency)	Number of Metaphors	Total Number of Metaphors	%
1 IWB as an instructive and guiding device	Teacher(30), Key(1), Wheel(1), Robot(1)	4	33	27.5
2 IWB as a device that assists learning	Friend(9), Whiteboard(4), Glass(3), Tablet(3), My mother(2), Pencil(1), Hand(1), Plane(1), Projection(1), Theatre(1)	10	26	21.7
3 IWB as a source of information	Book(12), Computer(5), Scientist(2), Library(2), Encyclopedia(1), Golden source(1), My father(1), Brain box(1), Internet(1), Supermarket(1), Knowledge box (1)	11	28	23.3
4 IWB as a source of happiness	Chocolate(4), Candy(2), Fruit(1),	3	7	5.8
5 IWB as a source of entertainment	Cinema(6), Game(3), Television(2), Mp3(2), Noon break(1), Break time(1), Tivibu(1)	7	16	13.3
6 IWB as an unnecessary device	Boys(4), Unnecessary(2), Waste of time(1), Impudent trouble(1), Scrap(1), cheap-jack(1),	6	10	8.4
	Total	41	120	100

### Category 1. IWB as an instructive and guiding device

In this category, 4 metaphors were created by a total of 33 students (Table 2). The metaphors in this category were teacher(30), key(1), wheel(1) and robot(1). The metaphor “teacher”, which was created by 30 students, constitutes a significant majority of the metaphors in this category. The students who created these metaphors perceive IWB as an instructive and guiding device. According to these students, IWB is an instructive device that transfers the subjects to them like a teacher and a guiding device that shows them the way to knowledge. Some of the metaphors in this category and the reasons of students for creating them are stated by the students as follows:

*“IWB is like a teacher, because subjects are taught on the IWB and we learn the subjects from the IWB as we learn from the teacher.” (Student 67)*

*“IWB is like a teacher, because there are various applications and add-ons on the IWB. These add-ons not only make it easier to understand the subject, but also help us to reinforce the subject and do various activities.” (Student 114)*

*“IWB is like a teacher, because IWB gives us most of the information regarding the subjects like a teacher.” (Student 25)*

*“IWB is like a teacher, because it is a mediator that enables us to learn all the information.” (Student 66)*

*“IWB is like a teacher, because it gives us information, we get information from the subject modules it includes.” (Student 69)*

*“IWB is like a teacher, because we can learn everything we learn from the teacher also from the IWB.” (Student 83)*

*“IWB is like a teacher, because it helps me whenever I want to reach information.” (Student 88)*

*“IWB is like a teacher, because it teaches us how to revise all of our subjects.” (Student 110)*

*“IWB is like a teacher, because it enlightens us and helps us just like our teacher does.” (Student 111)*

*“IWB is like a key, because just as a key opens a door, IWB opens a door that goes to knowledge.” (Student 52)*

*“IWB is like a wheel, because cars cannot move without wheels, and the classes at school cannot progress without IWB.” (Student 80)*

*“IWB is like a robot, because it both teaches and never gets angry.” (Student 132)*

## **Category 2. IWB as a device that assists learning**

In this category, 10 metaphors were created by 26 students (Table 2). The metaphors in this category were friend(9), whiteboard(4), glass(3), tablet(3), my mother(2), pencil(1), hand(1), plane(1), projection(1) and theatre(1). The students who created these metaphors perceive the concept of IWB as a device that assists learning. Some of the metaphors in this category and the reasons of students for creating them are stated by the students as follows:

*“IWB is like a friend, because it helps us study our subjects. Just as I learn from my friends, I learn from the IWB too.” (Student 39)*

*“IWB is like a friend, because showing interest in it is good for the subjects. It can teach you the things you do not know.” (Student 117)*

*“IWB is like a whiteboard, because it helps us to have a lesson easily.” (Student 81)*

*“IWB is like a glass, because it shows and teaches everything to us.” (Student 24)*

*“IWB is like a tablet, because it is touch-operated, it is like a computer and it is very similar to a tablet. I can use all the subjects I study on my tablet also on the IWB too.” (Student 146)*

*“IWB is like my mother, because it helps me in every respect like my mother.” (Student 32)*

*“IWB is like a pencil, because I can write everything I want very easily.” (Student 30)*

*“IWB is like a hand, because we can find everything by touching the IWB just as we can find everything by touching with our hands.” (Student 12)*

*“IWB is like a plane, because we can reach information fast and easily just as we can reach anywhere we want fast and easily by plane.” (Student 53)*

*“IWB is like a projection device, because it helps us learn by reflecting and displaying the information in the books for us.” (Student 36)*

*“IWB is like a theatre, because it visually presents the existing fact to us.” (Student 124)*

## **Category 3. IWB as a source of information**

In this category, 11 metaphors were provided by 28 students (Table 2). The metaphors in this category were book(12), computer(5), scientist(2), library(2), encyclopedia(1), golden source(1), my father(1), brain box(1), internet(1), supermarket(1) and knowledge box(1). The students who created these metaphors perceive the concept of IWB as a source of information which they can utilize anytime. Some of the metaphors in this category and the reasons of students for creating them are stated by the students as follows:

*“IWB is like a book, because it contains a lot of information and informs students.” (Student 31)*

*“IWB is like a book, because I can reach all kinds of information I want easily through the IWB.” (Student 87)*

*"IWB is like a book, because it saves information and presents to us when we want to reach it." (Student 96)*

*"IWB is like a computer, because everything we look for exists in the IWB just as it exists in a computer." (Student 78)*

*"IWB is like a scientist, because IWB has a lot of information as scientists have most of the information." (Student 51)*

*"IWB is like a library, because just as we reach the information we want through thousands of books in a library, IWB also enables us to reach information faster and quicker." (Student 113)*

*"IWB is like an encyclopedia, because whenever we want to search something we look up an encyclopedia. We can look for anything we need also on the IWB just like an encyclopedia." (Student 140)*

*"IWB is like a golden source, because all useful information is there." (Student 161)*

*"IWB is like a brain box, because it enlightens us with its knowledge." (Student 9)*

*"IWB is like the internet, because we find information more systematically and easily by means of it." (Student 62)*

*"IWB is like a supermarket, because we can find all the lesson notes we need on the IWB." (Student 86)*

*"IWB is like a knowledge box, because all the information needed by students regarding school subjects can be obtained easily by opening this box." (Student 149)*

#### **Category 4. IWB as a source of happiness**

In this category, 3 metaphors were provided by 7 students (Table 2). The metaphors in this category were chocolate(4), candy(2) and fruit(1). According to the students, using the IWB enables them to understand the subject better and thus to feel happy. Some of the metaphors regarding this category and the reasons of students for creating them are stated as follows:

*"IWB is like chocolate, because I become happy when using it, just as I become happy when eating chocolate." (Student 49)*

*"IWB is like chocolate, because just as chocolate gives happiness, IWB also gives happiness." (Student 119)*

*"IWB is like candy, because when I use the IWB I feel energetic and happy during the classes, just as I feel energetic and happy when I eat candy." (Student 2)*

*"IWB is like a fruit, because when I eat fruit, I both enjoy it and I take advantage of the vitamins. When I am studying with the IWB, I understand the subject better and since I understand the subject better, I become happy." (Student 124)*

#### **Category 5. IWB as a source of entertainment**

In this category, 7 metaphors were provided by 16 students (Table 2). The metaphors created in this category were cinema(6), game(3), television(2), mp3(2), noon break(1), break time(1), tivibu(1). The students that created the metaphors in this category perceive IWB as a source of entertainment that enables them to enjoy themselves. Some of the metaphors regarding this category and the reasons of students for creating them are stated as follows:

*"IWB is like cinema, because it is very enjoyable to watch movies on the IWB when there are no classes, because it has a very wide screen." (Student 154)*



*“IWB is like cinema, because the whole class can watch a movie without making any noise for 3 hours.” (Student 123)*

*“IWB is like a game, because I play a lot of games and have fun together with my friends owing to the IWB.” (Student 57)*

*“IWB is like a television, because we can watch movies on the IWB.” (Student 44)*

*“IWB is like an mp3, because we always listen to music and enjoy ourselves with my friends using the IWB.” (Student 95)*

*“IWB is like noon break, because we enjoy ourselves by watching movies and listening to music on the IWB during noon break.” (Student 136)*

*“IWB is like break time, because we always play games on the IWB during break time.” (Student 137)*

*“IWB is like tivibu, because we watch all the movies on the IWB and enjoy ourselves.” (Student 160)*

### **Category 6. IWB as an unnecessary device**

In this category, 6 metaphors were provided by 10 students (Table 2). The metaphors created in this category were boys(4), unnecessary(2), waste of time(1), impudent trouble(1), scrap(1) and cheap-jack(1). The students that created these metaphors think that the use of IWB in classes is unnecessary. Some of the metaphors regarding this category and the reasons of students for creating them are stated as follows:

*“IWB is like boys, because boys always disrupt the class. A large part of the class is also disrupted when IWB is used.” (Student 129)*

*“IWB is like an unnecessary object, because it is of not much use and causes noise and visual pollution.” (Student 159)*

*“IWB is like a waste of time, because we can study more during the classes rather than spending that much effort for using the IWB.” (Student 23)*

*“IWB is like an impudent trouble, because seeing it consumes the peace of the soul and causes sadness.” (Student 100)*

*“IWB is like scrap, because it always breaks down when we try to use it in class.” (Student 131)*

*“IWB is like cheap-jack, because all those unnecessary students gather around it and fight to touch it.” (Student 139)*

### **Discussion and Conclusion**

The aim of the present study is to determine what the IWB, which has started to be used widely in schools around Turkey within the scope of FATİH project, means for high school students through metaphor analysis. The 41 metaphors created by high school students considering the perceptions regarding the concept of IWB were divided into 6 groups. According to these categories, IWB was perceived as an instructive and guiding device, a device that assists learning, a source of information, a source of happiness, a source of entertainment and an unnecessary device. The most important metaphors in these categories were respectively “Teacher(30)”, “Friend(9)”, “Book(12)”, “Chocolate(4)”, “Cinema(6)” and “Boys(4)”.

In various metaphor studies, it is stated that a single metaphor would not be enough to explain a concept as a whole. As cited by Saban, Koçbeker and Saban (2006, p.504), Yob (2003) states that “Primarily, a metaphor is not the thing being referred to but a symbol of it. If it were the same as the thing it was referring to it would not be needed. Therefore, it is other than and in some respects less than what it refers to, even when referring powerfully and provocatively. One way to compensate for this deficiency in representation is to employ a

variety of metaphors". Similarly, also in this study, the IWB is referred to as "an instructive and guiding device", "a device that assists learning", "a source of information", "a source of happiness", "a source of entertainment" and "an unnecessary device" by the students through various different metaphors.

According to the findings obtained in the study, the category with the highest metaphor frequency was "IWB as an instructive and guiding device" ( $f=33$ ). Accordingly, 27.5% of the participants stated that IWB has an instructive and guiding feature. A review of the related literature shows that the features of the IWB that enhance teaching and learning were emphasized in previous studies (Kennewell & Beauchamp, 2007; Smith, Higgins, Wall, & Miller, 2005; Tataroğlu & Erduran, 2010; Wall, Higgins, & Smith 2005). According to Beauchamp and Kennewell (2008), IWBs, which have an important place in ICTs, increase the motivation of students in classroom practices. In a study on the views of primary education students regarding IWB applications in the teaching of Geography subjects in Social Sciences classes, Kaya and Aydın (2010) report that the students stated that they better comprehended the Social Sciences classes through the use of IWBs. According to the students in the research group of the study, the IWB is a device that facilitates the job of the teacher, provides a visual aspect to the lesson and enables them to learn easier.

Another finding of the study shows that the participants perceived IWB as "A device that assists learning" ( $f=26$ ). Accordingly, 21.7% of the participants stated that IWB is a device that assists learning. In this category, the participants see IWB as a "whiteboard" that helps their learning and facilitates the lessons, a "friend", "mother" and "hand" that helps them and provides convenience in every respect, and as a "plane" which enables all these in a fast and easy way. Similarly, in a study conducted by Wall, Higgins and Smith (2005), the perceptions of students about the IWB in classrooms were studied in Britain. As the result of the study, it was stated that the students generally perceived IWBs as a device that helped them to comprehend and understand the subjects.

According to the findings of the study, the category with the highest metaphor frequency after the category of "IWB as an instructive and guiding device" was the category of "IWB as a source of information" ( $f=28$ ). Besides, with 11 different metaphors, this category is the one with the highest number of metaphors created by the participants. Accordingly, 23.3% of the participants see the IWB as a source of information that they can utilize any time. Levy (2002) classifies the contribution of IWBs to teaching in three main groups as 'learning resources and the presentation of information', 'explanation of concepts and ideas' and 'interaction and facilitation of activities'. IWBs are powerful tools for interaction and besides maintaining the accessibility of various resources; they support discussion and interactive learning (Becta ICT Research, 2003). In addition, if necessary or when an extra resource related to a topic is needed, it is possible to connect to the internet via the IWB and make use of these resources during the teaching process (Starkings & Krause, 2008).

According to the findings of the study, the category with the least number of metaphors was the category of "IWB as a source of happiness" ( $f=7$ ). Accordingly, 5.8% of the participants perceive the IWB as a source of happiness. Furthermore, with 3 different metaphors, this category is the one with the lowest number of metaphors created by the participants. In their metaphors, the participants state that they become happy when they use the IWB just as they become happy when they eat "chocolate", "candy" and "fruit" and because of this they see the IWB as a "source of happiness".

Another finding obtained in the study is that the IWB was perceived as a "Source of entertainment" ( $f=16$ ) by the participants. According to this, 13.3% of the participants see the IWB as a "source of entertainment" that helps them have an enjoyable time because they can "watch movies", "listen to music" and "play games" on the IWB. Several other studies on the views of students regarding IWBs also provided findings which show that IWB was seen as a source of entertainment by the students (Genesi, 2009; Hall & Higgins, 2005; Levy, 2002; Mechling, Gast, & Thompson, 2008; Wall, Higgins, & Smith, 2005). Genesi (2009) conducted a study in order to determine the perceptions of third grade students about IWBs. As the result of the study, Genesi (2009) found that the students saw IWBs as entertaining and interesting devices because of their multimedia features and advanced visual contents.

Another remarkable finding of the study is that the IWB was perceived as an "Unnecessary device". When the metaphors created by the participants about IWB in this category are examined, it is seen that the setting up of the IWB for use during the class caused "a waste of time" and the device was perceived as a "scrap" because of the technical problems experienced during its use. Similar findings exist in the related literature. According to Wall, Higgins and Smith (2005) the IWB is seen as a problem by the students because it causes technical problems like other technological devices and it is needed to wait for turning it on and off during the class. In a study conducted on 6<sup>th</sup> grade students, Hall and Higgins (2005) state that the students see certain technical

problems, the incompetence of students and teachers in terms of using ICTs and the limited access of students to technology as the negative aspects of using IWBs.

In conclusion, when the metaphors that the students created about the concept of IWB and the categories formed using these metaphors are taken into consideration, it is seen that 94 students (78.3%) were aware of the educational benefits of IWBs and had positive views about IWBs, 16 students (13.3%) were interested in certain features of the device such as watching movies, listening to music and playing games and 10 students (8.4%) were not aware of the educational benefits of the IWBs and had negative views about the device. According to these findings, it is seen that there is a need for improving the attitudes of students and teachers towards IWBs and thus technology in order to maintain the relevant and effective use of this technology.

## Recommendations

Since the findings presented here are the results of a small qualitative study, it is considered that it would be too early to take radical and fast decisions about IWBs in schools where the use of these devices is still in infancy stage. It is suggested that more studies should be conducted on how to integrate technologies like the IWB, which provide huge benefits in terms of enriching educational environments and increasing the effectiveness of the lesson, into teaching environments.

## Notes

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