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Comparative Analysis of Metaphors of Primary School Students and Teachers on Interactive Whiteboards

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Abstract

This study aimed to examine the perceptions of primary school 4th-grade students and their teachers about interactive boards (ET) through metaphors. In this study, the phenomenological pattern, one of the qualitative research designs, was used. The study's working group, in which data analysis was conducted through the content analysis technique, consisted of 127 students studying in the 4th-grade of primary school and 41 primary school teachers. The sampling of the research was determined by the criterion sampling method. In the study, the data were, "Interactive boards like/similar to …, because … " was collected with a structured form consisting of questions asked. In the study, it was found out that the students and teachers produced 31 and 20 metaphors related to interactive whiteboards, respectively; that the metaphor "Computer" was the most frequently repeated metaphor by both teachers and students; that the category with the highest frequency was "Entertainment tool" in the categories produced by the students and that the category with the highest frequency was "Information collection tool" in the categories created by the teachers. It was also found out that while the metaphors created by the teachers and students related to IWBs were generally positive, but the participants produced some negative metaphors.

Keywords: Interactive whiteboard, metaphor, educational technology, student, primary school teacher

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Introduction

Defined as tools trying to clarify how people see the environment they live in, facts, events, and objects through different images (Ekiz & Koçyiğit, 2013), metaphors can be expressed as interpreting, defining, or explaining of one thing by mentioning another. It can be said that metaphors are mental images that help people perceive their environment and illuminate complex structures with simpler images. Some of the basic functions of metaphors may involve uncovering, interpreting, and transferring a great deal of data and information, ensuring that new information is discerned and eliminating uncertainties (Petrie & Oshlag, 1993). As they explain the unknown with the well-known metaphors, help understand and demonstrate a new fact and acquire new information more easily (Ekiz, 2001). In this case, metaphors can be defined as tools that explain the unknown with the well-known, express the complex concepts and structures with simple similes, and allow individuals to express themselves more easily. Metaphors can also be defined as tools by which abstract events, facts, principles, concepts, and rules are explained using concrete expressions, simple examples, and similes.

Metaphors can be said to be simulation tools that make complex structures understandable, diversify perceptions about education, and reveal teachers' and students' views on education's facts and concepts (Ekiz & Koçyiğit, 2013). Metaphors are developed by individuals to make an abstract or complicated concept or reality more comprehensible (Akın & Minaz, 2018). In short, it can be said that metaphors are mental images that enable individuals to perceive their environment and illuminate complex structures (Taş, 2019). In education, metaphors are preferred in educational planning, developing curriculum, motivating the individual to learn, bringing creative and inquisitive thoughts to the fore (Aydın and Pehlivan, 2010), and explaining the complex concepts and events and facts (Semerci, 2007). It can be said that through metaphors, teaching methods and techniques, program contents, teaching materials, roles, and tasks of teachers, perceptions related to lessons and abstract concepts encountered during the teaching process can be explained and understood more easily.

In Turkey, within the FATİH project's scope, IWBs were put into classrooms to make use of technology. Also known as the electronic board, smart board, and digital board, IWBs are presentation devices that use computers and reflectors together (Shenton & Pagett, 2008). IWB is an educational technology where computers and reflectors can be moved or

fixed, and teachers can transfer their materials as multifunctional via special software (Březinová, 2009).

Related literature reveals that the opinions of teachers and students are frequently used in the studies on IWBs. It is seen that the studies have centered on the use of IWBs in different learning environments, the contribution of IWBs to the teaching process, the attitudes towards IWBs, the competencies related to IWBs, the educational importance and limitations of IWBs (Adıgüzel, Gürbulak & Sarıçayır, 2011; Akgül, 2013; Alparslan & İçbay, 2017; Altınçelik, 2009; Ateş, 2010; Altun, Gülay & Mazlum, 2018; Aydın, 2017; Balkaş & Barış, 2015; Bilici, 2011; Çoklar & Tercan, 2014; Elaziz, 2008; Gündüz & Çelik, 2015; Koçak & Gülcü, 2013; Korkmaz & Korkmaz, 2015; Seyitoğlu, 2014; Sünkür, Arabacı & Şanlı, 2012; Smeets, 2005; Şanlı, Altun & Tan, 2015; Tatlı & Kılıç, 2013; Türel, 2012; Usluel & Uslu, 2013; Yazar, 2015). In these studies, based on teacher and student opinions, results were obtained that teachers and students generally exhibit a positive attitude towards ETs and believe that this technology contributes to the education and training process, prevents time loss, and provides communication.

There is no academic study that examines primary school students' and teachers' perceptions about IWBs through metaphors that add originality to this study. This study is expected to contribute to the literature concerning revealing students' and teachers' perceptions of an important technological tool through metaphors. Considering that students' perceptions begin to occur at primary school age, it can be pointed out that early detection of students' perceptions about teaching materials is necessary and essential. The fact that teachers are indispensable in the education process has enabled them to be the research subject. The metaphors produced by students and teachers within the scope of this research are based on "what kind of interactive whiteboard?" and "what kind of educational technology?" It is thought that the answers given to the questions add special importance to the research.

As it is believed that students' and teachers' perceptions, opinions, and evaluations related to IWBs today, also known as the information age, this study focuses on these boards. One of the reasons for carrying this study is the belief that is revealing teachers' and students' perceptions, as the arch figures of educational activities, about IWBs through metaphors will provide crucial information and perspectives for educators and decision-makers of education.

Metaphors related to IWBs used in schools and the internal consistency of these metaphors can provide crucial insight into teachers' and students' perceptions about technological teaching material, which have an important place in education. From this point of view, this study aimed to analyze teachers' and students' perspectives about learning and teaching practices by questioning the meanings of their emotions and thoughts about IWBs. Once teachers and students' perceptions are identified, it may be possible to reshape educational activities in the future and create new dynamics and seminal practices from different sources and tools.

This study aimed to examine the perceptions of the 4th-grade students and teachers in the primary school on interactive whiteboards (IWB) utilizing metaphors. For this purpose, the following questions will be taken as the basis.

1. What are the metaphors produced by the students regarding IWBs?
2. What are the metaphors produced by the teachers regarding IWBs?
3. What are the similarities and differences between the metaphors created by the students and teachers?

Method

Research Model

One of the qualitative research designs, the phenomenological pattern, was used in this study, which examines the 4th-grade students' and teachers' perceptions in the elementary school on interactive whiteboards through metaphors. Trying to elucidate the perceptions and reactions of individuals about a phenomenon or event based on their experiences, the phenomenological pattern (Fraenkel, Wallen & Hyun, 2011) focuses on the facts and concepts which we are aware of but about which we do not have detailed knowledge and understanding (Yıldırım & Şimşek, 2018).

Study Group

The study group consisted of 127 4th-grade students and 41 classrooms teachers of primary schools in the Altınordu district of Ordu province during the academic year of 2018-2019. The study sample was determined by the criterion sampling method, which is one of the purposeful sampling methods. Defined as the study of all situations that meet a

predetermined set of criteria, the criterion sampling method (Yıldırım & Şimşek, 2018) involves a sampling composed of people, events, objects or situations that have characteristics determined concerning the research problem (Büyüköztürk et al., 2017). In the study, the sampling selection criteria were determined based on being a 4th-grade student and teacher in the elementary school and the presence of IWB in the classroom. The gender range of students, 67 (52.76%) of whom are boys, and 60 (47.24%) of whom are girls, is between 10-11 while the age range of teachers, 23 (56.10%) of whom are male, and 18 (43.90%) of whom are female, varies between 38 and 59 with professional seniority range between 14 and 36.

Data Collection

Participants were given a structured form composed of the question asked as "Interactive whiteboards like/similar to …, because …" to determine the perceptions of the 4th-grade students and teachers in the elementary school about IWBs. Teachers and students were asked to complete these incomplete sentences according to their perceptions.

The reason for using metaphors as a data collection tool in this study is the capacity of metaphor as a methodological resource to render and connect knowledge and life experiences in relevant and meaningful ways (Black, 2013). One common use of metaphor in education research is to illustrate or explain a concept in a way that will communicate effectively to the intended audience (Midgley & Trimmer, 2013). Metaphors are also important in ensuring that the feelings and thoughts of the individual, which they are not incognizant of, are disclosed (Şahin & Sabancı, 2018).

Data Analysis

In this study, the content analysis technique was used to analyze data because it aimed to determine the perceptions of elementary school 4th-grade students and teachers they created in their minds about IWBs. According to Yıldırım and Şimşek (2018), the main purpose of content analysis, which aims to achieve the concepts and relations that can explain the data obtained, is to provide a more detailed treatment of the data and to reveal the concepts and themes that do not arise with a descriptive approach.

The analysis of metaphors produced by participants was made taking into account the steps of coding and sorting the data, compiling sample metaphor image, developing themes/categories, organizing the data according to the codes and themes, conducting the

validity and reliability analysis of the data, making the quantitative data inputs and analysis, and interpreting the findings (Ekiz, 2009; Şahin & Sabancı, 2018; Yıldırım & Şimşek, 2018).

The Step of Coding and Sorting The Data

At this step, metaphors produced by teachers and students are listed according to their frequency and coded as a metaphor word produced by each student and teacher. The forms of 127 students and 41 teachers were examined, and it was determined that there were no forms that did not have metaphor expressions, metaphors, or were left blank.

The Step of Compiling Sample Metaphor Image

At this stage, metaphor expressions about metaphors were determined and written. In order to determine the students whose explanations related to metaphors were quoted were named and numbered as "Student-1, Student-2, ….Student-127" while "Teacher-1, Teacher-2, ….Teacher-41" were used to determine the teachers who were quoted.

The Step of Developing Themes and Categories

At this stage, firstly, the codes were examined, and common/similar aspects were determined and put together to form themes/categories.

The Step of Organizing The Data According to The Codes and Themes

At this stage, metaphors produced by teachers and students in relation to IWBs were combined under similar categories/themes taking into account their common characteristics.

The Step of Conducting The Validity and Reliability Analysis of The Data

At this stage, a detailed analysis of the data was made, and sample metaphor expressions which are thought to represent the best metaphors in the research, were compiled. The reliability of the study's data was conducted by taking expert opinion, participant approval, peer review, and inter-coder reliability processes (Boyatzis, 1998; Lincoln and Guba, 1985; Miles, Huberman, and Saldana, 2014). In order to ensure the reliability of the study, expert opinion on conceptual categories that were formed was obtained; the response forms of the teachers and students were analyzed at two different times, and the percentage of conciliation in the analysis was determined as 94%. Also, a faculty member who participated in the research as a co-expert and forms, including the participant opinions, were examined separately by both the researcher and the co-expert; and the participants'

responses, possible codes, and themes were discussed efficiently. In addition to the researcher, another expert was given the coding task, and consistency of 92% was found in the researcher's lists and the assigned encoder for the analysis and categorization of the participants' responses. Since the confirmation of the data converted to written text strengthened the preciseness and validity of the data (Silverman, 2006), the data lists, which were converted into written text, were confirmed after being checked by the teachers and students. In addition, detailed analysis of the research process, archiving of unprocessed data, and openness to audit if deemed necessary increase the reliability of the study (Creswell, 2013; Yıldırım & Şimşek, 2018).

The Step of Making The Quantitative Data Inputs and Analysis

At this stage, the data were transferred to the computer, and the frequencies and percentages of the data were calculated.

The Step of Interpreting The Findings

At this stage, the findings obtained from the data analysis were presented in a systematic, logical, consistent, and understandable manner and in line with the purposes and sub-objectives of the study. The findings were systematically interpreted with a critical approach, and the possible causes of the findings were identified in a multidimensional manner. Discussions backed up by the results of the related literature were made. In the interpretation of the findings, overgeneralizations were avoided in results and discussions, and a flexible language containing probability was used. Researchers paid close attention to make recommendations based on the research findings.

Findings

In this section, the findings obtained from the analysis of the collected data are included.

Metaphors of Primary School 4th-Grade Students on Interactive Whiteboards

The metaphors of the 4th-grade students related to IWBs are presented in Table 1.

Table 1. *Metaphors Produced by Students on IWBs*

Rank No	Metaphor	f	%	Rank No	Metaphor	f	%
1	Computer	12	9,45	17	Film	3	2,36
2	Tablet	9	7,09	18	Laziness	3	2,36
3	Toy	8	6,30	19	Test	3	2,36
4	Game	8	6,30	20	Noise	2	1,57
5	Internet	7	5,51	21	Cinema	2	1,57
6	Smartphone	7	5,51	22	Getting Bored	2	1,57
7	Video	7	5,51	23	Message	2	1,57
8	Music	6	4,72	24	Question bank	2	1,57
9	Teacher	6	4,72	25	News	1	0,79
10	Information box	6	4,72	26	Treasury	1	0,79
11	Robot	5	3,94	27	Book	1	0,79
12	Television	5	3,94	28	Homework	1	0,79
13	Dance	4	3,15	29	Danger	1	0,79
14	Waste of time	4	3,15	30	Exam	1	0,79
15	Entertainment	4	3,15	31	Malfunction	1	0,79
16	Drowsing	3	2,36				

Table 1 highlights that 127 students produced 31 metaphors in total, and the most frequent metaphors among these metaphors were “Computer,” “Tablet,” “Toy” and “Game”; the least produced metaphors are ”News,” “Treasury”, “Book,” “Homework,” “Danger,” “Exam” and “Malfunction.”

The metaphors produced by students related to IWBs and categories created are presented in Table 2.

Table 2 shows that the metaphors produced by the elementary school 4th-grade students related to IWBs are grouped under five categories, and “Entertainment Tool” has the highest frequency among these categories, followed by “Information Tool,” “Communication Tool,” “Unpopular/Undesired Class” and “Exam Tool.” Sample metaphor expressions related to the determined categories are as follows:

Table 2. *Metaphors Produced Related to IWBs and Categories Created*

Categories	**f**	**%**	**Metaphors**	**F**	**%**
Entertainment tool	42	33,07	Toy, Game, Entertainment, Video, Music, Film, Dance, Cinema	8	25,81
Information tool	40	31,50	Computer, Tablet, Teacher, Information box, Robot, Treasury, Book	7	22,58
Communication tool	22	17,32	Smartphone, Internet, Message, News, Television	5	16,13
Unnecessary/undesired tool	16	12,60	Waste of Time, Drowsing, Danger, Laziness, Noise, Getting Bored, Malfunction	7	22,58
Exam tool	7	5,51	Test, Question Bank, Homework, Exam	4	12,90
Total	127	100	Total	31	100

Entertainment tool:

IWB is like **a** "*toy." We play with it in our spare time.* (Student-1)

*IWB is like "entertainment." It's a lot of fun for me because there are so many videos, movies, cartoons, animation, and music on the boards. (*Student-91)

IWB is like "music." We usually turn on IWB and listen to music. Sometimes we upload music songs we bring from home. (Student-67)

IWB is like "cinema." There are many cartoons, animations, and movies on these boards. Most of the time, our teacher opens these films for us, and we all watch them. (Student-104)

IWB is like **a** *"video." We often watch videos during breaks and lunch breaks.* (Student-2)

Information tool:

IWB is like a "computer." Since there is a computer in IWB, it can do everything the computer does, and it knows everything. (Student-101)

IWB is like a "teacher." We learn a lot of information from IWBs just as we learn from the teacher. (Student-50)

IWB is like an "information box." As these boards are connected to the internet, you can write and learn down any information. (Student-39)

IWB is like "book." We learn much from IWBs just as we learn from books. (Student-32)

IWB is like **a** *"robot." Robots give us information by speaking. These boards can give information vocally.* (Student-5)

Communication tool:

IWB is like a "smartphone." We can communicate via smartphones. These boards also have this feature due to the internet. (Student-28)

IWB is like the "internet". We can communicate with relatives who are far away via voice and video calls. These boards also have this feature, but teachers do not allow use for this purpose. (Student-86)

IWB is like a "message". We can send and receive messages from these boards. Therefore, these boards always bring to mind messaging. (Student-10)

IWB is like "news." When we turn on these boards, sometimes the news goes down from the bottom, and I read them all. (Student-121)

IWB is like "television". IWB shows us news from our country and other countries just as we watch and learn from television. (Student-46)

Unnecessary/undesired tool:

IWB is like "drowsing". While I watch IWB, I always sleep. (Student-2)

IWB is like "noise". I'm very uncomfortable when the teacher opens the board in the class, or my friends watch videos from the board. I am annoyed by loud the sound. (Student-110)

IWB is like "getting bored". The teacher frequently turns on IWB in the class. I get bored, keeping quiet, and looking at the same place. (Student-24)

IWB is like a "waste of time." Our teacher spends a lot of time turning on IWB. Most of the time in the class is spent on turning on the board. (Student-68)

IWB is like "laziness". The teacher turns on IWB and shows us a movie or a video. We idly watch from our desks. (Student-110)

Exam tool:

IWB is like a "test. " Our teacher usually opens test exams from IWB, and we answer the questions. (Student-18)

IWB is like a "question bank." IWB contains many questions. These boards remind me of the question bank because of the abundance of questions. (Student-84)

IWB is like "homework". Our teacher gives homework assignments. Most of my friends do their homework on this board. For, when you open this board, it shows homework that has been done. (Student-100)

IWB is like an "exam". These boards include exam samples and questions for all classes. (Student-111)

Metaphors Produced by Primary School Teachers Related to Interactive Whiteboards

The metaphors produced by primary school teachers related to IWBs are presented in Table 3.

Table 3. *Metaphors Produced by Primary School Teachers Related to IWBs*

Rank No	Metaphor	f	%	Rank No	Metaphor	f	%
1	Computer	5	12,20	11	Teacher	2	4,88
2	Convenience	4	9,76	12	Information	1	2,44
3	Resource	4	9,76	13	Cinema	1	2,44
4	Technology	3	7,32	14	Robot	1	2,44
5	Library	3	7,32	15	Laziness	1	2,44
6	Film	3	7,32	16	Treasury	1	2,44
7	Music	2	4,88	17	Waste	1	2,44
8	Speed	2	4,88	18	Inconvenience	1	2,44
9	Entertainment	2	4,88	19	Future	1	2,44
10	Waste of time	2	4,88	20	Easiness	1	2,44

Table 3 highlights that 41 teachers produced 20 metaphors in total and that the most frequently repeated metaphors were "Computer," "Convenience" and "Resource"; the least produced metaphors are "Information," "Cinema," "Robot," "Laziness," "Treasury," "Waste," "Inconvenience," "Future" and "Easiness."

The metaphors produced by primary school teachers and categories created related to IWBs are presented in Table 4.

Table 4. *Metaphors Produced by Primary School Teachers and Categories Created Related to IWBs*

Categories	**F**	**%**	**Metaphors**	**F**	**%**
Information tool	16	39,02	Computer, Resource, Library, Teacher, Information, Treasury	6	30,00
Technological tool	11	26,83	Convenience, Technology, Speed, Robot, Future	5	25,00
Entertainment tool	8	19,51	Film, Music, Cinema, Entertainment	4	20,00
Unnecessary/Undesired tool	6	14,63	Inconvenience, Waste of time, Laziness, Waste, Easiness	5	25,00
Total	41	100	Total	20	100

Table 4 demonstrates that the metaphors produced by primary school teachers are group under four categories and that "Information tool" has the highest frequency, followed by "Technological tool," "Entertainment tool," and "Unnecessary/Undesired tool." Sample metaphor expressions related to the determined categories are as follows:

Information tool*:*

IWB is like a "computer." Because IWBs have all the features of computers, I often use the board like a computer. (Teacher-12)

IWB is like a "teacher". IWBs can act as a teacher since they have both verbal and visual broadcasting features. (Teacher-38)

IWB is like a "treasury." These boards are connected to the internet and are considered a rich information store. (Teacher-9)

IWB is like a "library". IWBs are like libraries with many books in terms of the information they contain, thanks to internet technology. It is possible to obtain all the information provided by a library with hundreds of books. (Teacher-32)

IWB is like a "resource." These boards are considered very important sources of information because they can give us any information in a few seconds thanks to search engines. (Teacher-5)

Technological tool*:*

IWB is like "convenience". These boards make it easier to access, disseminate, and share information. (Teacher-19)

IWB is like "technology". IWBs indicate the current situation in technology. (Teacher-7)

IWB is like "speed". It is very fast to access and share information with IWBs, thus preventing time loss. (Teacher-3)

IWB is like a "robot." Robot technology has improved a lot, and we can consider IWBs as robots that have entered our academic life. (Teacher-30)

IWB is like a "future". These boards always remind me of the future. I believe our technology will shape our future. (Teacher-40)

Entertainment tool*:*

IWB is like a "movie". During classes, I open movies about the subject very often. (Teacher-18)

IWB is like "music". During breaks, children often use these boards to listen to music. Sometimes we listen to music in lessons. (Teacher-29)

IWB is like "cinema". We often watch movies with students using IWBs as a cinema screen. (Teacher-3)

IWB is like "fun". These boards seem like a fun box because they can find many videos, cartoons, animations, and music songs. (Teacher-21)

Unnecessary tool*:*

IWB is like "inconvenience". Turning on IWB and trying to find the material related to the subject matter is exactly inconvenient. I think it would be better if I taught the lesson. (Teacher-35)

IWB is like a "waste of time." It takes a lot of time to turn on IWB. And find the movie or video on the subject. Sometimes the internet is cut off or too slow, which is wasting time. (Teacher-1)

IWB is like "laziness". Some teachers turn on IWB in the class, open movies for children, and not teach anything. At the same time, students prefer to watch movies instead of listening to lectures. In short, these boards make both teachers and students lazy. (Teacher-38)

IWB is like "waste". I don't think IWBs are very useful. I think the government wastes money every time I see these boards. (Teacher-8)

IWB is like "easiness". Most of my colleagues and students get accustomed to easiness because of IWB. Both teachers and students can easily access all kinds of

information without making any effort. This makes people get accustomed to readymade things and easiness. (Teacher-24)

Discussion

In the current study, it was found that the students produced 31 metaphors related to IWBs and the most frequently repeated metaphor was the computer' metaphor and that the metaphors created by students associated with IWBs were collected in 5 categories and the category with the highest frequency was the category of "Entertainment Tool" followed by the categories of "Information Tool," "Communication Tool," "Unnecessary/Undesired Tool" and "Exam Tool". In the study, it was also found that the primary school teachers produced 20 metaphors related to IWBs and the most frequently repeated metaphor among these metaphors was the metaphor "Computer" and that the metaphors produced by teachers related to IWBs were collected in 4 categories and the category with the highest frequency was the category of "Information Tool" followed by the categories of Technological Tool", "Entertainment Tool" and "Unnecessary/Undesired Tool."

It is observed that a large number of metaphors were produced by students and teachers related to IWBs. The fact that many different metaphors were created can explain that teachers' and students' perceptions based on their observations, knowledge, and experience are different. Metaphors that are important for individuals to express their feelings and thoughts are mental tools that a person can use to understand and clarify an abstract, complex or theoretical phenomenon at a high level (Yob, 2003). Metaphor helps to expose the symbolic meanings of the words and helps individuals understand what others think, feel, and understand (McEntee-Atalianis, 2011; Patterson, 2017).

The metaphor produced by the students most in the research is the metaphor of "Computer." It can be said that the high level of creating the "Computer" metaphor is because IWBs have common features with computers. IWBs are the tools in which computers and projectors are used together. It can be said that children who are in close contact with computer technology have likened these tools to computers since the software installed on IWBs has similar features as computer software, such as video and movie playback, listening to music, drawing and diagrammatizing, and recording. The words stated by a student as "IWB is like 'computer.' Since there is a computer in IWB, it can do everything the computer does, and it knows everything." support the findings that reveal students compare IWBs to computers. In a study conducted by Kaya and Aydın (2011),

students stated that they likened IWBs to computers because of their features such as writing and drawing, visual and auditory presentation facilities, multimedia features, and the internet connection. A study by Sünkür et al. (2012) stated that students perceived and used IWBs as computers. In the study conducted by Çoklar and Tercan (2014), it was determined that IWBs made the users dependent on the computer because of their similarity to computers.

The metaphors produced by the students related to IWBs were mostly grouped under the category "Entertainment Tool." In this category, students compared IWB to toys, games, entertainment, video, music, film, dance, and cinema. This result of the study shows that IWBs are perceived as an entertainment tool by students. It can be said that IWBs' multimedia features such as video and movie playback, listening to music, playing games, drawing, and diagrammatizing led to a high emphasis on the component of IWBs as an entertainment tool. It can also be said that this perception is caused by the use of IWBs' functions such as film, cartoon, animation, video watching, listening to and downloading music, and playing games during breaks. The words stated by a student as "IWB is like 'entertainment.' It's a lot of fun to me because there are so many videos, movies, cartoons, animation and music on the boards. Sometimes, we open these boards in the break and dance" are meaningful.

In a study by Gülcü (2014), it was stated that it is an important advantage of IWBs that visual materials such as painting, photography, and video can be used effectively during the class. In the study conducted by Gündüz and Çelik (2015), students found IWBs to be entertaining. The words stated by a student as "IWB is like 'toy.' We play with it in our spare time" and "IWB is like 'video.' We often watch videos during breaks and lunchtimes on IWB." also support the findings of the study related to the perception of IWBs as a means of an entertainment tool by students. In other studies, it has been found that IWBs break the monotony, make lessons more fun and interesting and increase motivation in the classroom (Ateş, 2010; Balkaş & Barış, 2015; Beeland, 2002; Bilici, 2011; Kırbağ-Zengin, Kırılmazkaya & Keçeci, 2011; Levy, 2002; Sünkür et al., 2012). Türel (2012) states that the activities made through IWBs are very interesting and fun and thus lead students to focus on the material or technology and ignore the lesson, which can be considered a disadvantage.

It can be said that the frequency and way teachers use these boards in the classes are also influential in their perception of IWB as an entertainment tool. The words stated by a student as "IWB is like 'cinema.' There are many cartoons, animations, and movies on these boards. Most of the time, our teacher opens these films for us, and we all watch them." are

noteworthy. In his study, Türel (2010) suggests that teachers using various visuals and activities such as hide/show, drag/drop, and matching activities can provide a more meaningful and fun way to learn for students.

A remarkable result in the study is the seven metaphors collected under the category of "Unnecessary/Undesired Tool," developed by some students concerning IWBs (Waste of Time, Drowsing, Danger, Laziness, Noise, Getting Bored, and Malfunction). In the study conducted by Gündüz and Çelik (2015), it was determined that the use of IWB in the class was unnecessary. It can be said that how teachers perceive and use these boards is highly influential in students' perceptions about IWBs as an unnecessary and undesired tool. The words stated by some students as "IWB is like 'laziness.' The teacher turns on IWB and shows us a movie or a video. We idly watch from our desks." and "IWB is like 'waste of time'. Our teacher spends a lot of time turning on IWB. Most of the class is spent on turning it on." are meaningful. According to Tor and Erden (2004), benefiting from IWBs is closely related to teachers' knowledge and skills in this field. In their study, Glover and Miller (2001) pointed out that the use of IWB is important in providing educational benefits. In some studies, it has been determined that teachers do not use IWBs in their classrooms and that some teachers are not able to use this technology sufficiently because they use some limited features of these boards (Beauchamp, 2004; Gürel, Ülgen, Çağıltay & Yıldırım, 2007; Korkmaz & Korkmaz, 2015; Smith, 2008). The failure of teachers to actively use these tools probably creates a perception of redundancy towards these tools.

Among the reasons why students perceive IWBs as undesired and unnecessary tools are frequent technical failures and malfunctions (Çoklar & Tercan, 2014; Gülcü, 2014; Türel, 2011), the lack of adequate and suitable materials that can be used in IWBs (Somyürek, Atasoy & Özdemir, 2009; Türel & Demirli, 2010), the presence of physical problems (being unable to see the screen, the position of the board, the size of the board, lighting, noise, etc.) (Gülcü, 2014; Hall & Higgins, 2005), reduction in students' motivation led by the passivation of students due to teacher-centered presentations (Gülcü, 2014; Türel, 2012), and the issue of waste of time caused by IWBs (Gülcü, 2014; Keser & Çetinkaya, 2013). The words by a student read as "IWB is like 'getting bored.' The teacher turns on IWB frequently during the class. I get bored keeping quiet and looking at the same place continuously. I think the teacher should teach the lesson" support the findings obtained in the study.

The metaphor produced by the teachers most is the metaphor of "Computer." It can be said that the reason behind the high level of creating the "Computer "metaphor is the common features of IWBs with computers. IWBs are an educational technology that offers a wealth of material via the internet network where computers and the projection device can be moved or fixed. Teachers can transfer their work in a multifunctional manner through multi-media thanks to special software (Březinová, 2009). It is an expected result that teachers perceive IWBs, consisting of the combination of smart screen and computer technology, as computers (Korkmaz & Korkmaz, 2015). IWBs are tools that can electronically present and control the educational contents through the computer and touch screen they contain, allow the ability to control, and have the features of caching and storing (Altınçelik, 2009; Altun et al., 2018; Bayrak, Karaman & Lead, 2014; Hall & Higgins, 2005; Tataroglu & Erduran, 2010). IWBs are generally compared to a computer by teachers because they consist of a computer, an interactive whiteboard, a reflector, and some software. The fact that it facilitates access to many sources of information and allows this information to be presented in the classroom can be said to be the reason why teachers compare IWBs to computers. The words by a teacher as "IWB is like a 'computer' and since IWBs have all the features of computers, I often use the whiteboard like a computer" also explain why teachers compare IWBs to computers.

The metaphors produced by teachers related to IWBs were mostly grouped under the category of "Information Tool." Teachers compared IWBs to a computer, resource, library, teacher, knowledge, and treasury. This result shows that IWBs are perceived by teachers as information tools. It can be said that the high level of emphasis on the ability of IWBs as an information tool is because IWBs facilitate access to information through computer and internet technology. This perception may stem from the fact that it uses these tools, and teachers can have access to all kinds of information they need through search engines in particular. Statements by some teachers read as "IWB is like a 'resource,' and these boards are considered to be very important sources of information because they can send us all kinds of information within a few seconds thanks to search engines" and "IWB is like a 'library.' Thanks to the internet technology, it is possible to obtain all the information that a library can provide with hundreds of books from these boards." back up the quantitative data obtained in this study. In a study by Sünkür et al. (2012), students stated that they could learn a lot from these boards by emphasizing the feature of IWBs related to acquiring knowledge. For, if needed, a piece of extra information or resource can be easily accessed

via the Internet through IWBs (Adıgüzel et al., 2011). In this case, it can be said that the use of IWBs in the learning environment allows students to have access to information more easily and learn better.

Teachers perceive IWBs as tools providing information because of their features such as giving and structuring information, displaying information with available sources and visuals, making explanations and comments on the subject, consolidating what is learned, recording activities, drawing pictures and graphics, playing films and videos, and being able to conduct interactive experiments (Cogill, 2002). A teacher's statement as "IWB is like a 'teacher.' IWBs can function as a teacher because they have both verbal and visual broadcasting features. IWB is a technology that facilitates access to many sources of information and enables their transfer into the class (Balkaş & Barış, 2015). As stated by a teacher, "IWB is like 'treasury.' Since these boards are connected to the internet, they are considered a rich information store."

A noteworthy result in the study is the five metaphors that are gathered under the "Unnecessary/Undesired Tool" category developed by some teachers concerning IWBs (waste of time, inconvenience, laziness, wasting, and ease of use). It is seen that metaphors under this category generally express undesirable situations in the education process by teachers. It is understood that these metaphors evoke the difficulty that can disrupt the educational process, wasting the time which is very important in the teaching process, the laziness and passivity which is likely to be rejected by those who influence the education process or by those who are influenced by the education process, and the spoon-feeding that prevents questioning. Results of other studies back up the statements by some teachers on the relevant issue as "IWB is like 'spoon-feeding.' The majority of my colleagues and students get accustomed to spoon-feeding and easiness. Not only teachers but also students have access to any type of information easily with no research and effort. This leads people to spoon-feeding and easiness." and "IWB is like 'laziness.' I know that some teachers turn on IWB during the class and have students watch movies and do not teach anything.

Furthermore, students prefer watching these movies lazily to listening to the class. In short, these boards make both teachers and students lazy." Some studies have pointed out the negative sides of IWBs as follows: IWBs lead to easiness for teachers and students, push them to laziness, passivize teachers and students, give rise to teacher-centered teaching, cause difficulty related to material preparation, lead to a loss of control on students during the installation and adjustment of the device, and have technical failures due to lack of

technological infrastructure (Altınçelik, 2009; Çoklar & Tercan, 2014; Gülcü, 2014; Keser & Çetinkaya, 2013; Türel, 2012). It can be pointed out that teachers perceive IWBs as unnecessary and undesired tools because technical failures or the time lost during the installation and operation of the system disrupt the flow of teaching and cause noise by weakening the class control, the duration of the lessons is not used effectively due to problems occurring in the calibration or computer connections, and interest and motivation of students reduce as students are unable to participate in the learning activities led by a teacher-centered presentation. The statement of some teachers as "IWB is like 'inconvenience.' I believe it is inconvenient to turn on IWB and find a subject-related material. I think it would be better if I would teach the lesson instead of dealing with the board." and "IWB is like a 'waste of time.' Using IWBs is not easy. It takes a lot of time to turn it on and find the film or video related to the subject. Sometimes the Internet is cut off or too slow, which causes a waste of time".

Adıgüzel et al. (2011) found in their study that teachers argued that IWBs reduce teachers' role and importance in educational activities. Teachers also think that IWBs will have negative effects such as weakening the ability of reading and writing books, making individuals addicted to the internet and computer, and making them move away from learning by experience leading them to get accustomed to ease (Aktaş, Gökoğlu, Turgut & Karal, 2014; Shenton, & Pagett, 2008). In the studies conducted by Bilici (2011) and Çoklar and Tercan (2014), it was determined that IWBs raised difficulties for teachers in terms of material and technical characteristics. In a study by Altun et al. (2018), it was found that teachers did not believe that IWBs were very useful. It is remarkable to note the expression of a teacher who stated, "IWB is like a 'waste.' I don't think IWBs are very useful. Every time I see these boards, I feel that the state wastes money." Besides, despite huge investments, they are not used with full capacity and are kept idle in some schools, which can be considered important problems related to IWBs (Türel, 2012).

In this study, it was found that the number of metaphors by students and teachers were very close, that even the metaphors of "Computer, Film, Music, Teacher, Library/Book, Entertainment, Waste of Time, Treasury/Information Box, Cinema/Television and Laziness" were identical, and that the metaphor of "Computer" was the most frequently repeated metaphor by both students and teachers. In the study on the teachers' and students' responses to the interview questions, it was understood that explanations related to the metaphor "Computer," which was the most frequently repeated one, and other similar

metaphors were alike. Similar thinking of teachers and students about IWBs shows that both the learner and the teacher have agreed on a teaching tool. This situation can be considered as a positive result of using these tools at the highest level.

In the study, it is seen that metaphors produced by teachers and students related to IWBs are gathered in similar categories, and even the categories of "Entertainment Tool," "Information Tool," and "Unnecessary/Undesired Tool" are identical. It is understood that the category which is produced by students most and has the highest frequency is "Entertainment Tool" and that this category consists of metaphors of "Toy, Game, Entertainment, Video, Music, Film, Dance, and Cinema." It can be said that these students, who are between 10-11 years old, perceive IWBs as a means of entertainment as they are more interested in the multimedia features such as video and movie playback, listening to music, playing, drawing, and diagrammatizing. It is understood that the category of "Information Tool" is the one produced by teachers with the highest frequency and that this category consists of metaphors of "Computer, Resource, Library, Teacher, Information, and Treasury." It can be said that teachers' roles and tasks related to giving information, training, and teaching are influential in their perceptions towards IWBs as a means of information tool. It is concluded from the results of the study that students emphasize the entertainment aspect of the IWBs.In contrast, teachers emphasize the information aspect depending on their characteristics, experience, age, and interests. The fact that both the category of the entertainment tool and the category of information tool is top priority categories and that metaphors that make up these categories are similar reveal that teachers and students similar thoughts on these tools. It is expected that this similar thinking will be reflected in the educational activities positively.

A striking result in the study is the existence of the category of "Unnecessary/Undesired Tool" created by both teachers and students from similar metaphors such as "Waste of Time, Laziness, Noise, Getting Bored, Inconvenience." It can be said that among the reasons why some students and teachers perceive IWBs as unnecessary/undesired tools are technical failures/disruptions arising before and during their use, lack of adequate and appropriate material, the existence of physical problems related to the classroom environment, the possibility of causing teacher-centered presentations, reducing students' motivation by passivizing students, and causing waste of time. Similar opinions by teachers and students demonstrate that both learners and teachers agree on both

positive and negative aspects of a teaching tool. This situation can be considered as a positive result in taking necessary measures to benefit from these tools at the highest level.

Metaphors produced by teachers and students in relation to IWBs are specifically the photo frames of these boards and of the educational technologies in general. The metaphors produced about boards can determine the direction of the attention of decision-makers and practitioners of educational technologies by revealing the importance of the board, to what extent students and teachers attach importance to the board, its popular and unpopular aspects among students and teachers, and the demands and expectations of the teachers and students about IWBs. In this study, metaphors produced by teachers and students can be considered as responses to the questions "What kind of interactive whiteboard?" and "What kind of educational technology?" in the eyes of teachers and students.

Conclusion

When the results of the study are evaluated as a whole, it is seen that the metaphors of the elementary school 4th-grade students and their teachers about the IWBs are generally positive. In this context, it can be said that teachers and students have positive perceptions about these boards. In other studies, it has been concluded that teachers and students had positive feelings and thoughts and showed positive attitudes towards smart boards (Beauchamp, 2004; Beeland, 2002; Glover, Miller, Averis & Door, 2007; Kaya & Aydın, 2011; Somyürek et al., 2009; Sünkür et al., 2012; Wall, Higgins & Smith, 2005). However, the fact that some metaphors and some of the metaphor explanations are negative, although not too much, also show that teachers and students have negative feelings and thoughts about smart boards. In other studies conducted, it has been concluded that teachers and students carry some negative emotions and ideas towards smart boards (Altınçelik, 2009; Çoklar & Tercan, 2014; Gülcü, 2014; Keser & Çetinkaya, 2013; Türel, 2012). It should be considered that the positive emotions and thoughts of teachers and students regarding the technological equipment used in educational activities can lead to an increase in success by utilizing these tools at the highest level. Therefore, the teachers' and students' opinions and thoughts who produce negative metaphors about IWBs should be evaluated in detail, and necessary measures should be taken to eliminate negative perceptions.

In many studies, the lack of knowledge and experience of teachers and students about IWBs is expressed as the main cause of problems related to IWBs (Kayaduman, Sarıkaya and Seferoğlu, 2011; Korkmaz & Korkmaz, 2015; Levy, 2002; Smith, Higgins,

Wall & Miller, 2005; Somyürek et al., 2009). If teachers and students become confident in using technological resources, know the characteristics of IWBs and understand the basic principles and logic of interactive learning (Kennewell & Beauchamp, 2007), they will be able to use and benefit from IWBs more effectively and efficiently and at the highest level.

The positive impact of IWBs on learning depends on how teachers and students perceive and use these boards (Kennewell & Beauchamp, 2007). Teachers and students will not be able to make effective use of this technology without the necessary technical knowledge, skills, and support (Sünkür et al., 2012). In the course of a possible technical problem during the class, teachers and students need to intervene to solve problems instead of waiting for help. This emphasizes the importance of good in-service training for the teachers who will use IWB and inform the students in detail about the issue. Also, overcoming physical problems (being unable to see the screen, the board's position, the board's size, lighting, noise, etc.) can be said to be effective in eliminating negative perceptions of teachers and students towards IWBs.

The continuous development of the operating systems and software of IWBs, eliminating their errors, and providing different functions of them are of great importance for the use of these boards more effectively and more efficiently. For this reason, both software developers and IWB manufacturers can develop operating systems and software by considering the needs, opinions, and suggestions of the users and thus can provide a great advantage in solving the problems.

In this study, the perceptions of elementary school 4th-grade students and teachers about IWBs were examined through metaphors. It is thought that researches in which the perceptions of school administrators and students' parents about IWBs are examined through metaphors can also contribute to the field.

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