

Students' Views on the Use of Interactive Whiteboards in the Secondary Schools for Enhancing Classrooms Learning

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Abstract

This study was on students' views on the use of Interactive Whiteboards (IWBs) for enhancing classroom learning in the secondary schools in 6th grades. Quantitative research method design was conducted in the study and participants were the sixth grades students (N=378) in 10 secondary schools. Eleven closed questions (Yes/No) and forty items Likert-type questionnaire were used to collect data on the IWB use for classrooms learning. Mean score of 11 closed items were 73.65. of 40 items, mean scores of 36 items were higher than 3.00 and only two items were lower than 3.00. Reliability for Likert-type items various between excellent ($\alpha=0.92$) and good ($\alpha=0.87$).

Keywords: *Interactive whiteboards (IWB), improving learning, grade sixth, quantitative research method.*

Ortaokulda Öğrenimi Artırmak İçin Akıllı Tahta Kullanımı Üzerine Öğrenci Görüşleri

Özet

Bu çalışma, ortaokul 6. sınıflarda öğrenimi artırmak için akıllı tahta (IWBs) kullanımı hakkında öğrenci görüşleri üzerinedir. Veriler nicel olarak 10 ortaokulda, 378 öğrencinin katılımı ile toplanmıştır. Araştırmadaki soruların 11 tanesi kapalı (Evet / Hayır) ve 40 tanesi Likert-tipidir. Elde edilen skorlar göstermiştir ki; 11 sorunun ortalaması ellinin 73.65 ve 40 sorunun ortalaması üçün (3/5) üzerindedir. Sadece 2 sorunun ortalaması 3'ün altındadır. Likert-tipi soruların güvenilirlik katsayıları mükemmel ($\alpha=0.92$) ve iyi ($\alpha=0.87$) arasındadır.

Anahtar Kelimeler: *Akıllı Tahta, öğrenimin geliştirilmesi, altıncı sınıf, nicel araştırma yöntemi.*

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1. Introduction

In recent years, numerous educational technology (ET) products have been widely used in classrooms, one of which is the Interactive Whiteboard (IWB) (Betcher, & Lee, 2009). Educational technology equipment, such as IWB, has developed in parallel with the increased importance of technology in education. This new device, an electronic IWB, is also known under different brands such as Smartboard, and Promethean, has replaced traditional black boards in some schools (Becta, 2006) for enhancing learning in classrooms (Glover, Miller, Averis, & Door, 2007; Hodge, & Anderson, 2007; Duran & Cruz, 2011; Aubusson, Burke, Schuck, Kearney, & Frischknect, 2014; Luo, & Yang, 2016). This tool has been manufactured by Smart Technology in the years of 1991 (Smart Technology, 2006), and it has been used in classrooms since 1997 (Cogil, 2002). In Turkey, since 2003, IWB has been used extensively in the primary and secondary classrooms as well as in other countries (European Commission Report=ECR, 2013; Akkoyunlu, & Baskan, 2015; Balta, & Duran, 2015). These developments suggest that IWB technology is an excellent modern device in education (Kennewell, & Beauchamp 2007; Liang, Huang, & Tsai, 2012; Kilic, Guler, & Tatli, 2015). According to the ECR (2013), IWB use in classrooms is between 65 and 75% globally, but it varies according to regions and countries. Some countries such as United Kingdom, United States, Canada, Taiwan, Japan, Malaysia China and Australia have invested enormous amounts of money on IWBs (Karsenti, 2016) and they are also aware of the importance of using this technology, and they are also willing to integrate IWBs in learning (Emron, & Dhindsa, 2010; Aubusson, Burke, Schuck, Kearney, & Frischknect, 2014). In reference to ECR (2013), IWB has a high prevalence in primary (100%) and secondary schools (98%) in UK. Globally, IWB use is becoming increasingly popular, at all levels but especially in the lower grades. In Turkey, there are considerable variations between schools depending on their location. However in early 2013 the Turkish government has approved an open bid system for the purchase of 13 million tablet PCs under the Fatih Project by 2016, as many as 16 million tablets will be distributed in primary schools in order to improve educational technology conditions and increase the efficiency of the learning in primary and secondary schools as part of this project (Kurt 2013; Akkoyunlu, & Baskin, 2015; Dogan, Cinar, & Seferoglu, 2016). According to ECR (2013), Turkey will soon rank second globally in the use of tablet PCs in primary schools. For most of the world, IWB is one of the most current modern educational technology tools. According to predictions based on research, use of IWB in classrooms will continue to expand as seen in Figure 1 (Karsenti, 2016).

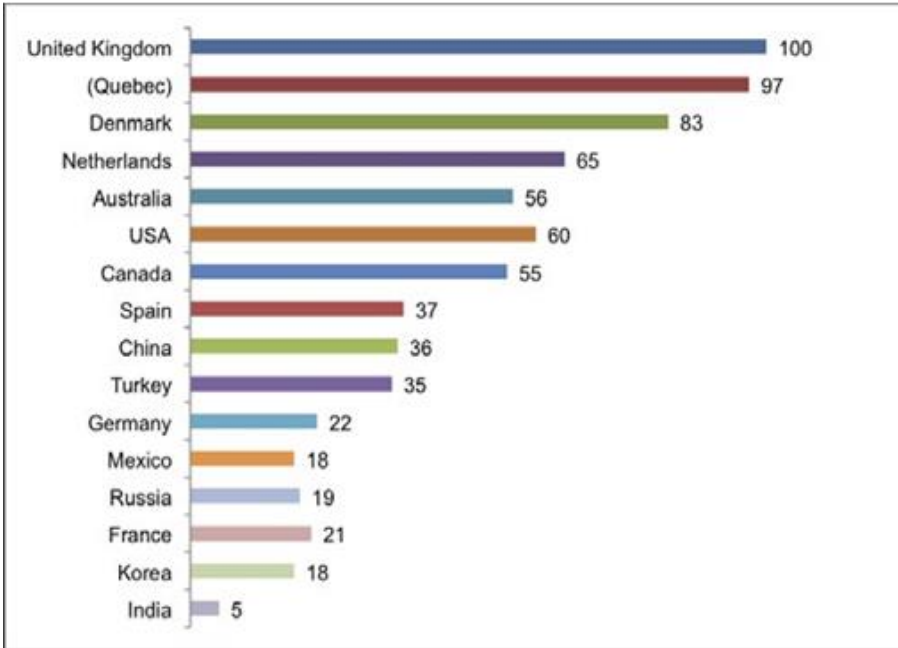


Figure 1. Presence of interactive white boards (IWB) in classrooms of various countries (Karasenti, 2016)

As soon as IWB was introduced in the classrooms, it has noticeably contributed to the effectiveness of learning process, which has been a reform in schools (Digregorio, & Sobel-Lojeski, 2010; Aubusson, Burke, Schuck, Kearney, & Frischknect, 2014). The current works suggests that when IWBs are implemented to provide some benefits students in learning process, which are summarized as following:

1.1. Advantages of Using IWB in the Classroom

With this technology, subjects are processed both visually and verbally, learning become easier and knowledge transfer becomes more permanent (Beeland, 2003; Hennesy, & Warwick, 2010).

Since the necessary course materials are prepared beforehand and teacher reflects the documents on the screen, students can focus directly on the topic of the lesson (Hall, 2011). The teacher can determine students' requirements, amount of detail learned and how much they understand (Liang, Huang, & Tsai, 2012). In general, the student feels more relaxation and effective, while learning the topic using IWB (Lacina, 2009). IWB provides opportunities such as ease in reviewing previous problems of students, doing repetition work (Digregorio & Sobel-Lojeski, 2010), easy

access to information and resources (Tomei, 2013). IWB' use of technology plays a powerful role in the development of their pedagogical skills in various areas (Glover, Miller, Averis, & Door, 2007; Hodge, & Anderson, 2007). This tool plays an important role for applying the question-answer education method and immediate recycling (Xu, & Moloney, 2011). IWB can receive the output of the texts for sharing with the others (Parker, & Martin, 2010) which can them also be reused in the future; so it saves time (Tertemiz, Sahin, Can, & Duzgun 2015). Due to IWB storage capabilities, thousands of animations, questions, maps, pictures, films and documents are available for reuse; teachers represent the topics in a better and in a way which is easier to understand (Karsenti, 2016). IWB is able to engage the entire class thereby gaining the students' interest (Morgan, 2008) and increasing their self-confidence (Hartsel, Herron, Fang, & Radhod, 2010). IWB increases student attendance (Wood, & Ashfield, 2008), motivates students to try harder, makes them more competitive (Interactive Technology, 2010). Furthermore, it and encourages collaboration among students (Armstrong, 2005). It raises their level of interest and motivation (Sarsa, & Soler, 2011), maintains their attention for a longer period of time and improves energy levels and encourages active participations (Gray, Hagger-Vaughan, Pilkington, Tomkins, 2005; Ardichvili, 2008). IWB contributes to more articulate presentations and enhances social skills of students (Blue, & Tirota, 2011). Students tend to learn more easily by visual and auditory modalities (Mavers, 2009; Sarsa, & Soler, 2011). Importantly, the class is fun and is not stressful for the students (A1-Shenton, & Padgett, 2007). IWB makes students creators and inventors (Lacina, 2009), helps them to develop self-confidence (Glover, Miller, Averis, & Door, 2007) and creates more positive behaviour (Mavers, 2009). The student does not feel obliged to take notes because they will receive a hardcopy of the lesson. When the student misses a lesson, they can access the needed information from IWB through the Internet (Parker, & Martin, 2010). These factors show that the IWB makes learning easier, quicker and contributes effectively learning (Cakiroglu, 2015).

1.2. Purpose of the Study

The study aims to evaluate and to analyze how secondary school 6th grade students view on the contribution of the use of IWB technology to learn. Within the main purpose of this context, the following research phases of the text will be answered;

- Reasons for selecting the grade 6th;
- Students view on IWB use;
- Students view on IWB use as contribution of learning IWB use;
- Impact of the social factors on students` IWB use;

1.3. Significance of the Study

Educator is the responsibility of the education system to employ a variety of opportunities for the students to gain interests learn the best way. Besides teachers' ability to do so, they benefit from educational technology instruments. The most prominent of these tools is the IWB. This device is perfectly integrated into education system and has turned from being a technology to delivery system for learners in classrooms. There has been considerable amount of research examining the issue of integrating contemporary educational technology, IWBs, into classrooms. It has been examined to better understand how this device' use effects in learning in classrooms.

Considering previous many studies technological devices, IWBs, are widely used in classrooms and integrated in education in recent years (Beeland, 2003; Emron, & Dihandsa; 2010; Tertemiz, Sahin, Can, & Duzgun, 2015). The majority of those studies investigated teachers' perceptions (Beeland, 2003; Lai, 2010; Abdulhamid; 2014; Oz, 2014; Balta, & Duran, 2015;), motivation (Morgan, 2008; Digregorio, & Sobel-Lojeski, 2010; Sarsa, & Solar, 2011), student-teacher interaction (Liang, 2012), different learning styles (Hatami, 2012) participate and collaborate (Armstrong, 2005), students' attitude towards technology (Emron, & Dhindsa, 2010; Demir, Ozturk, & Dokme, 2011) and educational technology (Celik, 2012; Oz, 2014). Students' views toward IWB use in the classrooms have been examined for learning (Aytac, 2013; Tertemiz, Sahin, Can, & Duzgun, 2015).

As the quantity of IWBs in Turkish classrooms is increasing, the productivity of these devices in promoting learning will continue to be questioned. In this context, in the early 2013 the Turkish government has approved the Fatih Project by 2016, as many as 16 million tablets will be distributed in primary schools in order to improve educational technology conditions and increase the efficiency of the learning in primary and secondary schools (Kurt 2013; Akkoyunlu, & Baskin, 2015).

Literature on students' view of the contribution of the use of IWB technology in classrooms is still limited. We hope that this study contributes on the subject. The study might therefore offer valuable insight to the processes that influence IWB technologies' contribution to learning in 6th grade classrooms. E.g.; IWBs can improve the quality of learning at classrooms by diversifying learning resources (graphics, videos, audio), and by learning activities. In this context, in recent years, IWB educational technology is evolving rapidly making it one of the most fantastic educational tools in schools.

2. Method

2.1. Methodology

The design for this research study is a quantitative research method (Sofaer, 2002).

2.2. Participants

Three hundred seventy-eight students participated in this study from 5 public and 5 private schools in Anatolian districts in Istanbul, Turkey. As much as possible, schools were selected that had good quality IWB and teachers had been actively using them in their classes since 2010. Pre-studies were performed at other schools, which had the same specifications. Responses of high school and university students showed several differences. According to the results of pre-studies, it was concluded that the grade 6 is the most appropriate level (Table 1) as their responses most closely represent primary and secondary school students. Therefore, this study is based on grade 6 students; 60.31% of the students are in public schools. The other 39.69% students are in private ones.

Table 1.
Grades and Percentages of the Participants.

	Elementary School	Secondary School				High School		University	
Grades	5	6	7	8	9	13	1	2	
Was IWB actively used in your classes in previous years?	66.7	73.7	67.2	65.8	63.6	57.9	51.4	48.4	
Is IWB constantly used in your classes?	58.7	69.6	64.5	60.3	56.2	54.3	41.2	34.9	
Would you like to use IWB in your courses?	91.7	85.6	84.2	82.3	64.7	58.8	52.3	49.5	
Are you in favour of the use of the IWB in classrooms in	86.6	88.2	83.4	82.4	59.5	60.6	52.4	47.8	

2.3. Data Collection

In this study, the data were collected by quantitative. Data were collected during the spring education semester of the school year 2015-2016. Quantitative data were collected by the survey questions. To determine students view on IWB use (11 closed and 12 Likert types) and as contribution of learning IWB use (13) questions were administered. Fifteen questions were asked in order to examine the impact of the social factors on students' IWB use. To make it easier to answer, students were given a pencil and eraser at the beginning of the survey. Surveys were performed during a three-week period, on different days with equal time intervals. The questionnaires were answered by 378 students from 10 schools and then evaluated.

2.4. Instrument Development

In this study, the appropriate questionnaires were constructed and recent studies were examined (Mathews-Aydinli and Elaziz 2010; Parker, & Martin, 2010; Tertemiz, Sahin, Can, & Duzgun, 2015; Luo, & Yang, 2016). Creating scale survey for research

were distributed for feedback from 4 random students at 6 different schools. Teachers were selected by their field of expertise. To enhance content validity of the instrument, three experienced teachers from different secondary schools carefully reviewed all items of the instrument and vague items, unclear directions, words and unnecessary items were excluded or reduced according to experts' opinions. After review by two experts in survey question design, they were administered to the participants and scale survey tables created for research. For responses in the closed choice section evaluated and multiple choice section, using the 5-point Likert scale, each item was coded (1: Strongly Disagree, 2: Disagree, 3: No idea, 4: Agree, 5: Strongly Agree) (Streiner, 2003). However, a score below 3 on this scale denoted a negative attitude, a score of vicinity 3 a neutral attitude and a score above 3 a positive attitude. The overall Cronbach's Alpha coefficients for survey multiple choice questions estimated for the instruments were computed by using SPSS.

To ensure the reliability of the study, the survey questions were arranged so that some close meaningful questions were asked to resolve the contradictions in different ways in different tables.

2.5. Data Analysis

The collected data were analysed using the Statistical Package for Social Sciences (SPSS) packet programme version 21. The scores in the Likert scale are between 1 and 5. If the score approaches 5, the positive rate is high. The analysis issues in the text can be classified according to the Likert scale: agree (A=Agree+ Strongly Agree) and disagree (DA= Disagree+ Strongly Disagree), and option of the "No Idea" was excluded. The statics calculation are the means and standard deviations (SD) were calculated using the same program and are given in tables in the text. For the reliability and internal consistency of the values in the tables, Cronbach's alpha coefficients are calculated and interpreted by the limits of validity.

3. Results

Results of this study are presented in quantitative forms, which include the statistical results.

3.1. Reasons for Selecting the Grade 6th

According to the results of pre-studies, it was concluded that the grade 6 is the most appropriate level (Table 1) as their responses most closely represent primary and secondary school students. Another reason for the selection of the sixth grade, children at this age is generally passed from abstract thinking to concrete thinking.

3. 2. Students View on IWB Use

Eleven closed questions were asked in order to examine the general view of students about IWB use during lessons (Table 2). Majority of participants exhibited mostly positive views towards IWBs.

Table 2.

Descriptive of Students' Views toward IWBs use

	N=378, % of students' evaluate statement about IWB	Positive (Yes)	Neutral	Negative (No)
1	Are there advantages of using the IWB in classrooms?	83	5	12
2	What are the attitudes towards using IWB in classrooms?	64	13	23
3	Do you think that homework is better reviewed using IWB?	67	12	21
4	Do you understand subjects better when learning is done with IWB compared to ordinary learning courses?	78	4	18
5	Do you think that classical explanation of subjects is better with IWB use compared to explanations with WB	69	7	24
6	Do you think that the handouts are a good help in the IWB courses to learning better?	59	16	25
7	Do you learn better with using IWB the topics content the image, auditory, digital and figure?	81	3	16
8	Does the use of IWB in the classrooms benefit of presentation your works?	63	8	29
9	Will you advice your classmates the use IWB in their classrooms?	82	1	17
10	Will you use IWB in future?	86	0	14
11	Which one do you prefer in class: IWB (Yes) WB (No)?	78	3	19

3.3. Students View on IWB Use, Descriptive Statistics

Likert-type 15 questions were asked in order to examine the general view of students about IWB use during lessons. Mean views of students towards IWBs use in classrooms is nearly 3.70 or 74. Cronbach's alpha coefficient for questions in this section is 0.91 (Table 3).

Table 3.

Descriptive Statistics for Students' Views of the IWB use

Statements	Mean	SD	α=,91 N=378 % of students Disagree (DA)/Agree (A) with each statement	
			DA	A
1 I'm happy to use the IWB in class	3,76	1,16	17,3	69,0
2 As long as the IWB used in the classroom, my curiosity in technological education is growing	3,86	1,18	15,5	70,7
3 When taught with IWB, I have more fun and are cheerful during the lesson	4,02	1,00	10,3	77,6

4	I am easily able to present various sources and documents using IWB	3,95	1,18	12,0	79,3
5	I like to use IWB in learning due to the many applications which are provided	3,49	1,28	23,9	57,4
6	IWB gives me more confidence while learning in class	3,00	1,34	22,5	51,9
7	I can more practice with IWB in lessons	3,94	1,17	21,6	76,4
8	IWB encourages me to use the new technology	3,93	1,19	20,4	77,8
9	IWB provides easy display for visual documentation, such as pictures, diagrams, videos and animations	4,16	0,72	3,40	87,9
10	In using IWB I realize how technology and education are interwoven	3,81	1,07	13,70	70,7
11	IWB creates many new opportunities in education	2,65	1,06		
12	Presentation of lecture with IWB is excellent	3,93	1,18	12,0	74,6

3.4. Students view on IWB use as contribution of learning IWB use

As five-point Likert-type, 13 questions were asked to students in order to examine the students view on IWB use the contribution of learning in class. Responds of most of participants, 67.48 %, were positive views towards **use of IWB** technologies' contribution to learning in 6th grade classrooms. Cronbach's alpha coefficient for this part of the questionnaire is 0.92 (Table 4).

Table 4.
Students' Views on the Impact of Contribution of Learning of the IWB use

$\alpha = .92, N = 378$		% of students Disagree(DA)/Agree (A) with each statement			
Statements	Mean	SD	DA	A	
IWB.....					
1 increases my motivation, energy and eagerness	3,77	1,13	19,0	76,8	
2 makes lesson more interesting	3,89	0,90	8,9	82,2	
3 helps me grasp concepts and ideas	3,48	1,41	27,6	67,2	
4 makes me contribute more, competitive, argumentative	3,67	1,29	14,1	56,6	
5 makes me creative	3,67	1,26	18,9	69,0	
6 makes me concentrate more to lesson	3,46	1,23	13,8	57,9	
7 makes teacher and student more interactive	3,79	0,94	8,6	74,2	
8 makes lesson more enjoyable, fun and game-like	4,29	0,89	5,1	86,2	
9 makes lesson more planned and organized	2,92	1,35	21,7	57,6	
10 makes for instant feedback between student and teacher	3,61	1,19	17,8	69,2	
11 makes learning easier and without stress	2,31	1,32	16,9	67,2	
12 makes it easier to review past subjects	3,77	1,17	13,5	55,8	
13 makes me pay more attention to lessons	3,71	1,18	7,4	57,4	

Figure 2 is presented with emphasis on the impact of learning the among teacher-student-IWB. This tool assists understandably student's learning and teacher's teaching. Students, teachers and IWB together contribute to improving of enhancing

learning. The combination of these trio contributes to effective learning and they are indispensable in today's learning in classrooms.

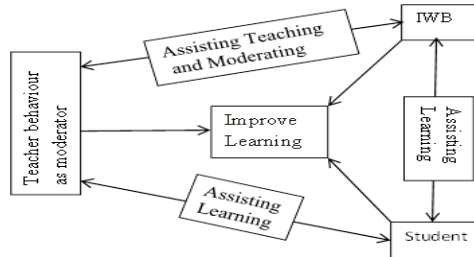


Figure 2. Schematic presentation of the contribution to the learning of students, teachers and IWB

3.5. Impact of the Social Factors on Students' IWB use.

Fifteen Likert-type questions were asked to students in order to examine their general social factors how IWB use influences to them. The positive scores of participants were around of 3.44 or 68.72. Cronbach's alpha coefficient for this part of the questionnaire is 0.87 (Table 5).

Table 5.
Impact of the Social Factors on Students' IWB use

$\alpha = ,87$, N=378		% of students Disagree(DA)/Agree (A) with each statement			
Statements	Mean	SD	DA	A	
IWB improves my.....					
1 personal skills	3,35	1,31	11,2	61,3	
2 critical skills	3,46	1,32	13,4	58,8	
3 social skills	3,83	1,21	12,7	81,1	
4 presentation skills	3,82	1,38	9,9	83,2	
5 curiosity about educational technology	3,83	1,13	14,9	70,1	
6 opportunities for different learning styles	3,32	1,63	15,6	53,8	
7 possibility to experiment in a virtual environment	3,12	1,11	13,1	86,3	
8 appeals to eye, ear and brain at the same time it makes knowledge more permanent	3,86	1,27	18,3	72,5	
9 visual and auditory ability	3,47	1,64	18,8	53,3	
10 improves my learning more quick and looking forward the subjects	3,57	1,36	23,2	66,3	
11 accelerates learning	3,52	1,13	17,6	63,2	
12 concentrate better in lessons because of not writing in notebook	3,59	1,32	27,2	65,3	
13 quality of learning in the lesson	3,67	1,15	11,4	69,7	
14 makes more comments on subjects	3,61	1,14	12,6	71,3	
15 learning to be permanent	3,87	1,13	10,9	74,6	

4. Discussions

As in other countries, use of IWBs technology in the classroom is increasing rapidly in Turkey. Thanks to Fatih project, Turkey is expected to have the second highest use, just behind the United Kingdom (ECR, 2013; Kurt 2013; Karsenti, 2016). Somehow, Karsenti (2016) reported that IWB use in various schools in Turkey is thirty-five percent.

As the ages and grade levels of the students' increase, their interest in and positive views towards IWB use decrease (Table 1). Reason for the selection of the sixth grade, children at this age is generally passed from abstract thinking to concrete thinking. Statistics on the results of the pre- study has shown that the most appropriate level selections were the grade 6th (Table 1). This finding played the most important role as it provided the reason for selecting grade 6 students for this study.

Various views of students on IWB use in classrooms were investigated. As seen in Table 2, the views of students on the use of the IWB are entirely positive (Yes). Of the 11 questions, three scores show high value: Q1 (83), Q9 (82) and Q10 (86). According to the latter, students are strongly identified the use of IWB in classrooms in the future. This findings confirm the previous study (Mathews-Aydinli and Elaziz 2010; Balta, & Duran, 2015; Tertemiz, Sahin, Can, & Duzgun, 2015).

Students were asked 12 different survey questions about providing benefits of IWB use in the classroom (Table 3). Of the 12 questions, one questions had the highest (Q9; 87.9) and one question had the lowest value (Q5; 57.4). The others scores appears to be vicinity of 73, which is the good result ($\alpha=0.91$).

As given in Table 4, students' views on as contribution of learning the use of IWB are examined in 13 surveys questions. When asked whether IWB use enhanced their learning, responses were strongly positive. The general average of the positive scores in learning section given to the questions of the students seems to be around 70. According to students' views IWBs create an atmosphere of entertainment–fun and games, which question had the highest value: Q8 (86.2). Of the most important findings was that with visual orientated subjects of students' state that IWBs play an especially important role and particularly make lesson more interesting, and increases energy and eagerness of younger students. These findings suggest that in the views of the students, the use of the IWB in the classrooms takes over a positive role in learning. Similar findings on the contributions of IWBs to academics were found in previous research (Mathews-Aydinli and Elaziz 2010; Lopez 2010; Digregorio, & Sobel-Lojeski, 2010; Karsenti, 2016).

The relationship between learning-technology is presented by the author in Fig. 2. Where it is clearly understood that how learning and IWB is intertwined. Students, teachers and IWB together contribute to improving of enhancing learning. This trio constitutes the most perfect learning elements in classrooms, recently.

Besides showing the effect of IWB use on learning (Table 4), In Table 5, contains questions (15) on the impact of social factors on students. According to the students' views, IWB use also shows the influence on students' personal skills, such as critical (Q2) and presentation (Q4) skills, and curiosity about educational technology (Q5). In this section, three scores have the high value, which are Q3 (81.1), Q4 (83.2) and Q7 (86.3). In particular, the visual and experiential content, Q7, has the highest score. It is understood from this finding that visual and experiential activities using IWBs have the highest/greatest impact on enhancing learning. As seen in Table 5, results show that IWB increases participants' social factors, accelerate and enhances permanent knowledges to learn (Kennewell and Beauchamp 2007; Ardichvili 2008; Sarsa, & Soler, 2011; Tertemiz, Sahin, Can, & Duzgun, 2015).

As a result of the above findings the studies regarding the use of interactive whiteboards indicate that they improve learning (Aytac, 2013; Yang, & Teng, 2014; Khamis, & Wafa, 2014; Luo, & Yang, 2016), they increase student participation and they have positive effects on student academic success (Tataroglu, & Erduran; 2009; Akbas, & Pektas, 2011).

5. Conclusion

The aim of this study investigated the 6th grade students' views on the use of IWB in enhancing learning. According to the results of this research, the views of students toward the uses of IWBs exhibit a very favourable description overall. IWB use is becoming ever more present in the learning process and more popular in classrooms day after day. Therefore, the shift from traditional whiteboard towards using newly developed IWB globally as well as in Turkish schools settings is a must since beginning with "Fatih project".

Students' general views regarding the use of the IWB in classrooms were strongly positive and almost all students have participated in this view. Accordingly, the incorporation of enhanced learning with strong potential will affect the IWB use with virtual and auditory contributions. Students have expressed their views that the IWB technology used in classrooms will positive affect on student academic learning success process, such as "efficient learning", "more effective and permanent learning", "increasing the interest of students" and "impact of the social factors of students". The relationship in enhancing learning among students-teachers-IWBs is presented in Figure.2.

5.1. Suggestions

- Developed scale applied to each different discipline with minor changes and students- teachers' views about the IWB spread to all grades (including university school) can be studied.

- Experimental studies on the effect of the IWBs usage on students' achievement can be administered.
- Students should be encouraged to use the educational technology tools,
- Research should aim to outcomes of contribution and enhancing learning with the use of IWB
- Collaboration should be provided by the teachers, technician and school managers for effective use of the IWBs
- Encouraging the educational administration to provide all governmental and private schools with IWBs.

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Genişletilmiş Özet

Bu çalışmanın amacı, ilköğretim 6.sınıf öğrencilerinin görüşünde, sınıflarda akıllı tahta kullanıldığından, öğrenim ve öğrenime katkısının belirlenmesi amaçlanmıştır. Çalışma İstanbul Anadolu bölgesinde, akıllı tahta ile donanımlı 5 devlet 5 özel okulda 378 öğrencinin katılımı ile 2015-2016 öğretim yılı bahar döneminde yapılmıştır. Yapılan çalışmada, ilk, orta, lise ve Üniversite öğrencileri arasında, sınıflarda akıllı tahta kullanıldığında en yüksek oranlardan birisi olan 6. sınıflar seçilmiştir. Bu sınıfın seçilmesinin bir nedeni de somut kavramdan, soyut kavrama geçiş yaşı olmasındandır. Yaş ve sınıf yükseldikçe öğrencilerin akıllı tahtaya olan ilgisinin azaldığı görülmüştür.

Çalışma için detaylı literatür araştırması yapılmış ve son yıllarda akıllı tahtanın en çok kullanılan eğitim teknolojileri aleti olduğu kanısına varılmıştır (Glover, Miller, Averis, & Door, 2007; Hodge, & Anderson, 2007; Duran & Cruz, 2011; Aubusson, Burke, Schuck, Kearney, & Frischknecht, 2014; Luo, & Yang, 2016). Diğer ülkeler gibi, Türkiye de sınıflarda akıllı tahta kullanımı hızla yayıldığı çalışmalarda görülmüştür (ECR, 2013; Kurt 2013; Karsenti, 2016).

Çalışmada aşağıdaki sorulara cevap aranmaya çalışılmıştır. Öğrenci görüşü ile;

- Akıllı tahta kullanımı,
- Akıllı tahtanın öğrenime katkısı,
- Akıllı tahtanın öğrencilerin sosyal karakterlerine etkisi.

Nitel olarak yapılan çalışmada, soruların 11 tanesi kapalı (Evet / Hayır) ve 40 tanesi Likert-tipidir.

Anket soruları araştırmacı tarafından oluşturulmuştur. Araştırmanın güvenilirliği için, anket soruları, aynı anlamı içerecek şekilde farklı olarak düzenlenmiştir. Soruları önce konularında uzman ve en çok akıllı tahta kullanan iki (Matematik ve Fen) öğretmen tarafından incelenmiş, uygun olmayanlar elimine edilmiştir ve sonra aynı donanımlı 6 okulda rastgele seçilen dörder öğrenciye uygulanmıştır. Çelişkili olan sorular aynı hocalar tarafından tekrar incelenerek uygunsuz olanlar çıkartılmıştır.

Katılımcılar, 60.31% devlet ve 39.69% özel okullardan oluşan 6.sınıf öğrencilerinden oluşmuştur. Veriler, 3 haftada farklı günlerde fakat eşit zaman aralıklarında 10 okulda 378 öğrenciye isimsiz olarak uygulanmıştır. Nicel bir araştırma yöntemi uygulanan çalışmada, anket vasıtası ile toplanan veriler SPSS 21 versiyon paket programı (Statistical Package for Social Sciences) ile analiz edilmiştir. Çoktan seçmeli sorular 5' li likert skalası kullanılarak değerlendirilmiştir (Streiner, 2003). Her bir soru (1: Kesinlikle Katılmıyorum, 2: Katılmıyorum, 3: Fikrim yok, 4: Katılıyorum, 5: Kesinlikle Katılıyorum) olarak kodlanmıştır. Değerlendirme olarak; 3'un altındakiler olumsuz, 3 fikir beyan etmemek ve 3 üzeri olumlu kabul edilmiştir.

Araştırmadaki sorular iki asamadan oluşmaktadır. 11 tanesi kapalı uçlu ve 40 tanesi çoktan seçmeli-Likert tipinden oluşturulmuştur. Birinci bölümdeki kapalı sorularla (Tablo 2), öğrencilerin, sınıflarda akıllı tahta kullanımı hakkındaki görüşleri ve öğrenime katkısının belirlenmesi amaçlanmıştır. Öğrenciler bu sorulara büyük çoğunlukla akıllı tahtanın öğretimde kullanılmasını ve öğretime katkısı olduğu yönünde olumlu cevap vermişlerdir.

Çoktan seçmeli-Likert tipi sorular da 3 parçadan oluşmuştur. Öğrencilerin akıllı tahta hakkındaki; genel görüşleri, öğrenmeye kasisi ve öğrencilerin karakterlerine etkisi. Öğrencilerin akıllı tahta hakkındaki genel değerlendirmesini tayin etmek için, 12 soru sorulmuştur (Tablo 3). Katılımcıların büyük bir çoğunluğu (ortalama 74%) olumlu bir tavır sergilemişler ve Cronbach's alpha tutarlılık katsayısı 0.91 bulunmuştur. İkinci kısımda, akıllı tahtanın öğrencilerin öğrenime katkısının motivasyonel etkisini araştırmak için 13 soru sorulmuştur (Tablo 4). Öğrenciler burada sorulan sorulara da 67.48 % ortalama ile olumlu cevap vermişlerdir. Buradaki soruların cevaplarındaki Cronbach's alpha güvenilirlik katsayısının değeri de 0.92 olarak hesaplanmıştır. Akıllı tahtanın öğrencilere kazandırdığı diğer bir olumlu avantaj da kişisel karakterlerine etkisi 15 soru ile belirlemeye çalışılmıştır (Tablo 5). Verilen cevapların anlaşılmıştır ki, akli tahta öğrencilerin; sunum, görsel işitsel-kalıcı bilgi ve derse odaklanma gibi katkıları olduğu görülmüştür. Burada Cronbach's alpha tutarlılık katsayısının değeri 0.87 olarak bulunmuştur. Bu pozitif bulgular diğer araştırmacıların çalışmaları ile karşılaştırıldığında uyumlu olduğu görülmüştür.

Metindeki (Sekil 1) semada, Öğretmen-Öğrenci-Akıllı Tahta döngüsünde, akıllı tahtanın öğrenime katkısı hakkında nasıl bir fikir verdiği görülmektedir. Bu uçlu birleşimden, akıllı tahtanın öğrenimi geliştirdiği ve katkısı açıkça görülmektedir.

Bulgulardan; akıllı tahta ile yapılan dersler öğrencilere, eğlence-hoş ve oyun gibi ilgi çekici gelmekte, öğrencilerin öğrenmeye olan motivasyonunu artırmakta ve istekli kıldığı açıkça görülmüştür. Akıllı tahtanın, özellikle görsel ve deneysel aktivitelerde öğrencilerin daha çok dikkatini çektiği ve öğrenimine katkı sağladığı verdikleri cevaplardan anlaşılmaktadır. Öğrencilerin; sunum ve merakına dikkat çektiği gibi, öğrendikleri bilgilerin de daha kalıcı olduğu öğrenci cevaplarından ve literatürdeki çalışmalardan anlaşılmaktadır (Kennewell and Beauchamp 2007; Ardichvili 2008; Sarsa, & Soler, 2011; Tertemiz, Sahin, Can, & Duzgun, 2015). Akıllı tahta, öğrencilerin akademik başarısına olumlu etki ettiği araştırmada ortaya çıktığı gibi literatüre çalışmalarında da rastlanmaktadır (Tataroglu, & Erduran; 2009; Akbas, & Pektas, 2011).