Teachers' Attitudes toward Using Interactive WhiteBoards

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Abstract

A vast technology integration project was initiated in Turkey to transform traditional classroomsinto smart classrooms by providing the Internet network, Interactive Smart boards for each classroom, and tablet computers for every teacher and student in grade 5-12. The purpose of this study was to investigate high school teachers' attitudes towards using the Interactive Whiteboard in the classroom. The Interactive Whiteboard Attitude Survey was used to collect data from 260 teachers during the 2013-2014 academic year. Teachers' attitudes toward using the interactive whiteboard were compared according to gender, age, number of years teaching, and area of teaching expertise. Results indicated that significant differences existed for attitudes toward using interactive whiteboard based on gender and content area specialty, while no differences were foundbased on age and years ofteaching experience.

Key Words

Use of technology, Interactive Whiteboard, FATIH Project

Introduction

The Interactive White Board (IWB) is one of manyInformation and Communication Technology (ICT) tools recently adopted by educational institutions. Also known asSmart Boards,Becta (British

Educational and Communications Technology Agency, 2004) defines IWBs as kind of a multimedia projector that allows instructors to display learning materials located on their computer. Another description of IWBs is a combination of a whiteboard with a computer and data projector that enables users to control applications by touching with their fingers or digital non-ink pens (Al-Qirim, Mesmari, Mazroeei, Khatri, &Kaabi 2010). In fact, IWBs function as a computer in the classroom environment, eliminating teacher dependency onthe desktop or laptopmonitor. IWBs enable even novice technology users to run applications such as CD-ROMs, word-processing documents, spreadsheets, and presentations and toutilizelearning materials available on the Internet by simply 'clicking' in the right places on the boardwithout compromisinginteraction with students (Becta, 2004). AL-Qirimand associates (2010) claim that the software and hardware features of IWBs lead teachers to facilitate the teaching process in a way that the teaching environment is enriched; and students are more active when these devices are appropriately used.Becta(2004) found that IWBs are good for enhancing demonstration and modeling, provide quality interactions, improve teacher assessment, balance resources and instructional planning, and help to increase the pace and depth of student learning.

Many schools have implemented Smart Boards along with other instructional devices and the availability of suchtools increases yearly. The ability to offer a variety of classroom activities such as brain storming, concept mapping, digital storytelling, online books, and toarchivelesson materials for future use has made these tools a popular inclusion on schools' technology improvement lists. As part of a vast technology integration project initiated in Turkey (the FATIH project; Movement of Enhancing Opportunities and Improving Technology, see the FATIH Project, 2015) to transform every traditional public school classroom into a 'smart classroom,' every classroom was networked with Internet service and Interactive Whiteboards, withtablet computersprovided to every teacher and student in grades 5-12. In addition, teachers were trained on a variety of technological tools for classroom use (e.g., document cameras, printers, scanners, etc.)

As Ertmer (1999) mentions, the lack of availability of technological tools is one of the main reasons schools cannot successfullyimplement technology plans. Shecategorizesbarriers to technology integration into two classes: first and second order barriers. First-order barriers occur when teachers do not have access to technological devices for use in classroom activities, while second-order barriers relate to teachers' beliefs about technology usage in the classroom.

In support of The Ministry of Transportation and Communication, The Scientific and Technological Research Council of Turkey (TÜBİTAK) and private companies, The Turkish Ministry of Educationlaunched a five-year project to remove allfirst order barriers in public primary, middle, and high schools (i.e., The FATIH project). Although this technology integration project was scheduled to be completed in2013, itremains in progress. The aim of FATIH project is described as providing equal opportunities and helping students to involve more sensory organs into learning and teaching activities through ICT devices (FATIH Project, 2015).

The FATIH project is composed of five main phases:

- ✓ Providing equipment (Internet Network, Tablet PCs, Interactive Boards, Document Cameras, and Multifunction printers) and software
- ✓ Providing and managing e-content (e-books, simulations, videos, etc.).
- ✓ Providing training for in-service teachers
- ✓ Providing reliable, measurable, manageable, and conscious usage of ICT
- ✓ Changing curriculum so that ICT will be incorporated

In accordance with these five components, all 570,000 classrooms in 42,000 public schools were equipped with the Internet and interactive whiteboards were installed in 85,000 classrooms in all high schools, except vocational high schools. However, all classrooms are projected to be installed with IWBs soon and tablet computers are still in the distribution phase. The pilot phase of FATIH project began in 52 schools in 17 provinces of Turkeyit was later extended to more schools in the piloting phase. All classrooms within the initial pilot program were networked withIWBs and 8,500 tablet computers were distributed to students and teachers. The expanded pilot phase of the project included schools in all 81 provinces of Turkey. In that phase, 49,000 tablet PCs were distributed both to students and teachers (FATIH Project, 2015).

Interactive White Boards in FATIH Project

In the first phase of IWB distribution, the government installed approximately 85,000 IWBs. In the second phase of IWB distribution the government signed a contract to install 347,367 more IWBs in January 2014 (FATIH, 2015). IWBs are projected to be installed all regular classrooms and labs, but not in study rooms or libraries (FATIH, 2015). Several government auctions occurred to acquire IWBs for all schools. Vestel (a Turkish Technology company) won the final government auction to provide IWBs for all public schools (Guven, 2014). The interactive whiteboards have thefollowing features: a65" touch screen, Windows 7 OS, Intel i3 processor, and 4GB memory. These boards provide a built-in Wi-Fi connection, three USB ports (to enable users to connect their keyboard, mouse, or PC), one HDMI port, and one VGA port, and audio in and out ports. Users can also connect their microphone and headsets to IWBs (Guven, 2014). These Interactive Boards come with a remote controlthat enables teachers to move about in the classroom while using an IWB. Traditional boards and IWB are installed atthe same basein each classroom to enable a smooth transition from the traditional to the electronic board (FATIH Projesi, 2015).

Literature Review

The wide use of Interactive White Boards (IWB) indicates that these tools are one of the key technological devices for educating digital learners. Teck (2013) proposes that IWBs are rapidly growing in educational institutions because they have a positive effect on student learning and create various opportunities for teachers. Biro (2011) has also found that the spread of IWBs makes students more curious, motivated, and interested in learning materials. IWBs are a powerful technology to increase students' motivation and learning and to vary teachers' instruction (Turel& Johnson, 2012), and also providenew learning opportunities (Campbell & Martin, 2010) and student engagement during the learning process (Beeland, 2002). However, Teck (2013) cautions that these interactive devices need to be approached by new pedagogical methods in order to render benefits. As opposed to computers in the classroom, Teck (2013) has found that interactive whiteboards are more efficient because of their touchscreen features. Teachers who contributed Teck's study mentioned that they do not have to sit on a chair to click and type to navigate teaching; instead they stand up in front of the students and navigate by touching Smart Board screen, making IWBs more efficient. Teachers in Teck's study also pointed out the importance of having onsite technical support to integrate and effectively use IWBs because problems occur in almost every technological device that cause disruption, delay, and frustration for teachers. These will eventually lead teachers to depart from technology use in the classroom. Teachers' concerns are parallel to Ertmer's (1999) findings; first-order barriers (lack of devices and lack of support) will cause second-order barriers (frustration to use technological devices) if teachers do not have enough support to solve technical

problems. Becta (2004) also emphasizesthe need for technical support. His committee warns schools to provide an adequate level of technical support before investing in IWBs because teachers need to be confident that they will have technical support when problems occur.

Becta (2004) also points out the importance of teacher training in order to have a successful integration of IWBs; all teachers need to have training that covers basic equipment operation, functionality, and maintenance of IWBs. Moreover, Becta (2004) emphasizes that pedagogical training should be provided soon after operational training to ensure teachers are well equipped with ideas and knowledge of how to effectively use these devices to enhance learning and teaching.

Improvements and new innovations in technology have changed many industries, including education. Biro (2011) claims that ICT technologies have generated new possibilities in teaching and learning that require new pedagogic approaches to teach with technology. In a traditional classroom, a teacher's role wasto present information to students, while a student'swas to memorize the presented material. In this traditional model teachers were more active than students. Today however, this is not the case, orat leastshould not be, since ICT has generated enormous amounts of information that cannot be taught or memorized through traditional teaching methods. Biro (2011) notes that today's teachers are helpers, while students are actively involved in thelearning process. He also claims that educators need to focus on constructive pedagogies to teach in today's classrooms. In a constructive approach, students take an active role in acquiring new information andorganizing it within their cognitive systems with the help of pre-existing knowledge and the guidance of teachers (Biro, 2011). He describes constructive teachers' roles as cooperating with students, not just as information transmitters, but also part of the learning, guiding students to reach and connect to the information, using various interactive methods, and deploying multiple visual aids to help students discover knowledge (Biro, 2011). He further claims that IWBs are an excellent ICT tool that constructivist teachers can integrate to fulfill the above mentioned teacher roles.

Method

The aim of this study was to investigate high school teachers' attitudes toward using the Interactive Whiteboard (IWB) in the classroom. The online questionnaire was administered to high school teachersin the 2013-2014 academic year. The original instrument of this study was created by Isman, Abanmy, Hussein, and Al Saadany (2012), and the validity and reliability of this instrument was ensured by running a Cronbach's Alpha test. The instrument was modified based on the present research aim. The items are translated into Turkish and verified by language experts in English and Turkish. Participants were asked to complete a survey that included 20 Likert-type items and four demographic questions (genders, age, teaching experiences and content area). Participants answered each question using the five-level Likert scale (1-Strongly disagree, 2-Disagree, 3-Neither agree nor disagree, 4-Agree, 5-_Strongly agree).

Table 1. Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.857	.866	20

Two research questions in this study wereaddressed:

1. What are the high school teachers' levels in using the Interactive Whiteboard in the classroom?

2. What are the high school teachers' attitudes toward using the Interactive Whiteboard in the classroom based ongender, age, teaching experiences and content area?

Data Analysis

The sample for this study was comprised of260 high school teachers withIWB in their classrooms. The researchers used Statistical Package for the Social Sciences (SPSS) version 21 to analyze the data. A one-way ANOVA was used to determine differences related to content area and teaching experience, and a series ofindependent t-tests were used to determinegender and age differences.

The demographic data collected included gender, age, teaching experience, and content area specialty. The demographic characteristics of the high school teachers who completed the survey are shown in the Table 2.

Table 2. Descriptive Results

		N	%
Gender	Male	189	72.69
	Female	71	27.31
Age	20-40 years	151	58.07
	41 years or more	109	41.93
Content Area	Instructional Technology	72	27.7
	Science/ Math	73	28.1
	Social Studies	115	44.2
Teaching Experiences	1-10 years	73	28.1
	11-20 years	108	41.5
	21 years or more	79	30.4

Findings

Findings regarding the first research question

Table 3 depicts the study instrument (in English), and the mean scores and standard deviations for the 20 survey items related to attitudes toward using the IWB. All means were greater than 3.0, ranging from 3.19 to 4.37 on the 5-point scale. This indicates an overall positive response and high regard toward using the IWB to each question measured in this present study.

The average score for item 5 (*I believe that it is important for me to be able to use technologies such as the computer and the interactive whiteboard)* was 4.37 (SD= .863), which was the highest score. The other highest average scores were 4.29 (SD=.860) for item 10and 4.31 (SD=.941) for item 1.

The mean score for item 20(In-service teacher training or teacher professional development regarding the use of interactive whiteboard is sufficient) was 3.19 (SD= 1.242), which was the lowest score. The other lowest average scores were 3.50 (SD=1.151) for item 19 and 3.75 (SD= .937) for item 14.

Table 3. Average Scores and Standard Deviation of Each Items
Descriptive Statistics

	M	**S.D**
1. Interactive whiteboard help me to teach easier	4.25	.941
2. I use interactive whiteboard software during the course (Starboard, etc.)	3.98	1.004
3. Interactive Whiteboard gives me more opportunities to teach my student new things	4.15	.923
4. I am tired of technology use in the classroom	4.06	.979
5. I believe that it is important for me to be able to use technologies such as the computer and the interactive whiteboard	4.37	.863
6. I feel comfortable when I use the interactive whiteboard in teaching	4.17	.884
7. Interactive whiteboard gives me more time to interact with students	3.87	1.025
8. I feel confidant using interactive whiteboard to design new instructional situations.	4.01	.979
9. Teaching with interactive whiteboard makes students happy	4.10	.801
10. Using the interactive whiteboard does not scare me	4.29	.860
11. I can concentrate better in teaching practices when I use the interactive whiteboard	3.94	.981
12. Using interactive whiteboard required hard work outside class	3.87	1.007
13. Using interactive whiteboard allows me to share learning resources with other teachers	4.09	.817
14. Interactive whiteboard restricts the movement of students in the classroom	3.75	.937
15. Using the interactive whiteboard does not make me nervous	4.16	.877
16. Using the interactive whiteboard provides teachers many multimedia resources	4.19	.883
17. The use of interactive whiteboards has a negative effect for classroom discipline.	3.85	.966
18. Using the interactive whiteboard helps me to deal with new technologies.	4.08	.804
19. Using the interactive whiteboard requires high experience in teaching	3.50	1.151
20. In-service teacher training or teacher professional development regarding to use of interactive whiteboard is sufficient	3.19	1.242
TOTAL	79.85	9.881

Findings regarding the second research question

The second research question examined high school teachers' attitudes toward using the Interactive Whiteboard in the classroom based on gender, age, teaching experience, and content area specialty.

For gender differences, an independent-samples t -test compared the means of males and females. The results show that there are significant differences between males and females in their attitudes toward using IWB in the classroom. Table 4 shows the independent t-test results.

Table 4. Differences in Perceptions Regarding Technology Based on Gender

Gender	N	$\bar{M}$	SD	t	p
Male	189	81,78	9,23	5,41	,001
Female	71	74,72	9,79		

An independent t-test was conducted to compare mean differences by age. Table 5 shows the results of the independent-test and there was no significant difference found for age.

Table 5. Differences in Perceptions Regarding Technology Based on Age

Age	N	M̄	SD	t	p
20-40 years	151	80,66	9,83	1,56	,121
41 ormore	109	78,73	9,88		

Table 6 illustrates the results of the one-way ANOVA comparing the means for years of teaching experience. No significant differences were found in attitudes toward using the Interactive Whiteboard based on teaching experience.

Table 6. Differences in Perceptions Regarding Technology Based on Teaching Experiences

		N	M	SD
1	1-10 Years	73	81,51	9,71
2	11-20 Years	108	79,40	10,04
3	21 ormore	79	78,95	9,76

Table 7 shows a one-way ANOVA comparing the means of teachers by content area discipline. There weresignificant differences found in attitudes toward using the Interactive Whiteboard based on content area.

Table 7. Differences in Perceptions Regarding Technology Based on Content Area

		N	M	SD
1	Information Technologies	72	88,08	6,15
2	Science/Math	73	77,41	9,21
3	SocialSciences	115	76,25	9,22

Conclusions and Recommendations

This paper has described the results of a study that was designed to understand high school teachers' attitudes toward using the Interactive Whiteboard in the classroom. Differences were foundfor high school teachers' attitudes toward using the IWB based on gender and content area. Male teachers have more positive attitudes toward using the IWB than female teachers, and information technology teachers have more positive attitudes toward using the IWB than Science/Math and Social Sciences teachers. There were no differences found in attitudes toward using the IWB based on years of teaching experienceor age. Several studies were conducted to identify teachers' attitudes toward use of IWB (Alshawareb&Jaber, 2012; Campbell & Martin, 2010; Isman et. al., 2012; Turel, & Johnson, 2012). For example, Alshawareb and Jaber (2012) did not findstatistically significant differences for teachers' attitudes toward using the IWB based on gender and content area (Scientific fields and Arts fields). However, they did find significant differences for teachers' attitudes toward using the IWB based on years of experiences, and teachers with more than 15 years experience had more positive use of IWB than teachers who had less than 15 years of experience.

The participants mentioned that using IWBs does not requireextensive teachingexperience. They also believed that in-service teacher training or teacher professional development regarding how to

use IWBs is not sufficient, and that the IWB does not restrict the students' movement in the classroom. In addition, they commented that the use of technology and the IWB is very important. Participants also mentioned thatthe use of the IWB helps teachers to deliver instruction easier. Among the features of the IWBs that helped teachers to transfer their materials and enrich instruction through the online materials were the 65" touchscreen, Windows OS, built in Wi-Fi connection, USB ports, and remote controls.

This study revealed that high school teachers believe that teachers need professional development to improve their skills and ability for effective usage of the IWB. Some studies emphasize the importance of teachers' professional development program for effective integration of technologies and IWB (such as Isman, Abanmy, Hussein, &Al Saadany, 2012; Gorder, 2008; Glover & Miller, 2001). Ertmer (1999), Becta (2004), and Pamuk, Cakir, Ergun, Yilmaz, and Ayas (2013) also pointed out the need for teacher training in order to have successful implementation of not just IWBs but more generally all ICT tools. Unfortunately, teachers who contributed this study indicated that professional development for teacher training to use IWB was not satisfactory. Ertmer (1999) indicated that time, access to ICT tools, training and support are the most important resources teachers should receive in order to overcome barriers in integrating IWBs into their daily instructional activities. Training should not be just technical in nature, in terms of how to use IWBs, but should also include pedagogical training on IWBs to help teachers integrate them in pedagogically-sound ways (Ertmer, 1999). As a result, technical and pedagogical training along with support from the school administration is necessary in order to achieve an ideal integration of IWBs in the classrooms.

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