Honeymoon with IWBs: A qualitative insight in primary students’ views on instruction with interactive whiteboard

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ABSTRACT

The main purpose of this study was to investigate the views of primary students about interactive whiteboard [IWB] use in their classes from attitudinal and pedagogical perspectives. Research was designed as an empirical approach to phenomenology. Data was collected from fifty primary students (fourth to eighth) through focus group interviews. Nvivo 9 qualitative data analysis software was used to analyze data. Results showed that students like instruction with IWB especially for such reasons/capabilities as practical and economical use, better visual presentation, and test-based use. Students were predominantly uncomfortable with the technical problems. They believed that instruction with IWB positively impacted their learning especially because of visualization and contextualization, effective presentation, test-based use, and motivational factors. Finally it was inferred that IWBs were not used to their full potential, and both technical problems and common practices indicated that teachers were still at an initial stage of transmission to instruction with IWB and they needed both technical and pedagogical training.

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1. Introduction

Over the last decade interactive whiteboard [IWB] technology has been a popular agenda in education (Erduran & Tataroglu, 2009; Lan & Hsiao, 2011; Levy, 2002; Murcia, 2008). While developed countries have already made considerable investment in IWBs (Digregorio & Sobel-Lojeski, 2010; Hall & Higgins, 2005; Higgins, Beauchamp, & Miller, 2007; Shenton & Pagett, 2007; Slay, Siebörger, & Hodgkinson-Williams, 2008; Wood & Ashfield, 2008), developing countries have followed them with the hope of better pupil achievement (Slay et al., 2008). Turkey also launched an extensive ICT integration policy in 1998 funded by national resources, the World Bank, and the European Union (Somyürek et al., 2009). As an important part of this ongoing integration process, IWBs have been mounted in technology classrooms of 2665 schools since 2006 (Ministry of National Education [MoNE], 2010) to support the curricular objectives (Somyürek et al., 2009). This process has been facilitated by government-supported projects such as FATIH-Enhancing Opportunities and Improving Technology (see http://fatihprojesi.meb.gov.tr/tr/index.php) (Adıgüzel, Gürbulak, & Sarıçayır, 2011; MoNE, 2011a) and with public and private grants for the purchase of IWBs (e.g. see MoNE, 2011b, 2011c).

Studies on Turkish teachers and students have revealed positive attitudes toward IWB use in various subjects including Geography (Ates, 2010), English (Elaziz, 2008), Science and Math (Erduran & Tataroglu, 2009), and Social Studies (Kaya & Aydin, 2011). In general, Turkish students and teachers find IWBs entertaining and interesting (Ates, 2010; Kaya & Aydin, 2011), exciting (Elaziz, 2008), and useful in terms of creating collaborative environments (Somyürek et al., 2009). These findings are consistent with the well documented international literature which also indicates strong positive attitudes toward IWBs (Armstrong et al., 2005; Beeland, 2002; Digregorio & Sobel-Lojeski, 2010; Hall & Higgins, 2005; Levy, 2002; Lewin, Somekh, & Steadman, 2008; Morgan, 2008; Moss et al., 2007; Rivers, 2009; Schuck & Kearney, 2007; Smith, Higgins, Wall, & Miller, 2005; Wall, Higgins, & Smith, 2005).

Unlike the literature favoring positive attitudes toward IWBs, research about the motivating power of IWBs remains controversial. The motivating and engaging nature of IWBs is not denied (Beeland, 2002; Erduran & Tataroglu, 2009; Moss et al., 2007; Rivers, 2009; Schuck &
Kearney, 2007; Torff & Tirotta, 2010) and its contribution to learning is frequently cited (Elaziz, 2008; Glover, Miller, Averis, & Door, 2005; Higgins et al., 2007; Schuck & Kearney, 2007; Shenton & Pagett, 2007; Smith et al., 2005; Wall et al., 2005). Furthermore, this motivation is attributed to IWBS' pedagogical characteristics including their interactive nature, and effective use of visual, auditory, and tactile characteristics (Beeland, 2002; Elaziz, 2008; Schmid, 2008; Wall et al., 2005). However, other research revealed that the initial motivation aroused by this new technology can be weak and short-lived (Levy, 2002; Moss et al., 2007; Torff & Tirotta, 2010). Moreover, its contribution to increased learning or achievement is still questionable (Digregorio & Sobel-Lojeski, 2010; Higgins et al., 2007; Moss et al., 2007).

From an instructional perspective, teachers are advised to use IWBS for various pedagogical intentions including scaffolding pupil learning, supporting the temporal development of learning, involving the pupils in co-constructing knowledge, encouraging evaluation and synthesis, developing a learning community and pupil–pupil dialog, supporting provisionality of students' evolving ideas, guiding lesson flow, and developing pupil questioning (Mercer, Hennessy, & Warwick, 2010). An overview of relevant literature indicated several instructional capabilities which IWBS offer including better classroom management (Beauchamp, 2004; Slay et al., 2008) and lesson organization (Ateş, 2010; Levy, 2002); flexibility in handling the lesson materials e.g. modifying materials, keeping the last-saved copies for re-use later (Elaziz, 2008; Levy, 2002; Wood & Ashfield, 2008), highlighting/zooming texts or pictures (Türel & Demirli, 2010); access to and use of multimedia content (Beeland, 2002; Elaziz, 2008; Hall & Higgins, 2005; Slay et al., 2008); better visual presentation (Adğuzel et al., 2011; Ateş, 2010; Hall & Higgins, 2005; Kaya & Aydin, 2011; Levy, 2002; Türel & Demirli, 2010) and contextualization (Levy, 2002, Murcia, 2006); consideration of student needs with different learning styles (Beeland, 2002; Glover et al., 2005; Hall & Higgins, 2005; Levy, 2002; Schuck & Kearney, 2007; Wall et al., 2005); and enhanced interaction with the board or peers (Beeland, 2002; Elaziz, 2008; Hall & Higgins, 2005; Higgins et al., 2007; Lan & Hsiao, 2011; Levy, 2002; Schmid, 2008; Schuck & Kearney, 2007).

Though all the above-cited instructional capabilities of IWBS are expected to bring increased learning and achievement, the relevant literature is again controversial. Surveys or interviews highlight the positive perceptions and expectations about IWBS' contribution to students' achievement (Beeland, 2002; Elaziz, 2008; Kaya & Aydin, 2011; Levy, 2002; Slay et al., 2008; Wall et al., 2005), and some empirical research (Ekici, 2008; Lewin et al., 2008) found positive impact of IWBS on student achievement. Yet, other research (Glover et al., 2005; Moss et al., 2007; Smith, Hardman, & Higgins, 2006) has found no or minor impacts of IWBS on facilitated learning or achievement.

This dichotomy between what is expected from IWBS and what actually happens brings up the question: Do teachers not adequately or properly use IWBS? A general review of the literature helps us answer this question to some extent. Though effective use of IWBS can be guaranteed with teacher training and ongoing professional development, teachers usually lack the technical and pedagogical competency to use IWBS effectively (Adğuzel et al., 2011; Digregorio & Sobel-Lojeski, 2010; Elaziz, 2008; Shenton & Pagett, 2007; Smith et al., 2005; Somyürek et al., 2009). As a matter of fact, adequate use of IWBS requires special training and is not guaranteed by having ICT skills (Al-Qirim, 2011). The failure to train the teachers to gain the necessary technical and pedagogical competency seems to cause classroom management problems as a result of technical troubles (Ateş, 2010; Hall & Higgins, 2005; Levy, 2002), ineffective use of IWBS as a substitute for black/whiteboard or projection (Digregorio & Sobel-Lojeski, 2010; Glover et al., 2005; Gursul & Tozmaz, 2010; Levy, 2002; Murcia, 2008; Slay et al., 2008), and restricting learners' access to and interaction with IWBS (Al-Qirim, 2011; Hall & Higgins, 2005; Shenton & Pagett, 2007). Moreover, technical problems degrade teacher's confidence level (Levy, 2002) and cause frustration among students (Wall et al., 2005). Similarly, students are disappointed and frustrated when IWBS' capabilities are under-used (Levy, 2002).

1.1. The purpose of the study

The main purpose of this study was to investigate the lived experiences of primary students about IWBS use in their classes from attitudinal and pedagogical perspectives. It also aimed to evaluate the quality of instruction with IWBS by defining its weaknesses and strengths based on student views. In this respect this research is considered significant in terms of exploring the relationship between students' attitudinal reactions to IWBS use in their lesson and pedagogical quality of instruction with IWBS.

2. Method

2.1. Research design

This study was designed as a qualitative phenomenology. To Creswell (2007) phenomenological research describes the meaning of "lived experiences of a concept or a phenomenon" (p. 57) and their "focus is on describing what all participants have in common as they experience a phenomenon" (p. 58). The present study aimed at investigating the lived experiences of primary students about IWBS (or instruction with IWBS) being used in their classes for about two years. Accordingly, the researchers followed a more empirical approach to phenomenology, which involved collecting data from students (in homogeneous focus groups) who experienced the phenomenon for about two years, analyzing the data by reducing the information to significant quotes and combining them into themes giving a combination of textual and structural description of authentic experiences in terms of the conditions, situations, or context (Creswell, 2007).

2.2. Participants

Sampling for this study was done in two steps. First, according to a purposive sampling approach, a typical school was selected which included students who had about two years of experience regarding IWBS use in their lessons, in order to "develop a composite description of the essence of the experience" (Creswell, 2007, p. 58). Since the use of IWBS in every class was not a familiar phenomenon in the research setting, this typical school was selected to "provide a qualitative profile" about the phenomenon (Patton, 2002, p. 236). Next, homogeneous sampling was used to select students in focus group interviews. The intention was to bring together students of "similar backgrounds and experiences" (Patton, 2002, p. 236). Moreover, after explaining the purpose of the study those students "who [were] not hesitant to speak and share ideas" (Creswell, 2007, p. 133) were requested to participate, since "less articulate, shy interviewee [might] present the researcher with a challenge and less than adequate data" (p. 133) in focus groups. On the other hand, the number of participant in each focus group was limited to ten (though many students were willing to participate). This number was considered small enough to enjoy the interactive nature of focus
group interviews and large enough to obtain comprehensive and detailed data. As a matter of fact, the ideal number of members in focus groups has been reported to be not too small or large e.g. 4–12 (Wilson, 1997), 7–10 (Bogdan & Biklen, 2007, p. 109), 6–10 (Sharts-Hopko, 2001, p. 90), 6–12 (Miles & Huberman, 2003, 9–10) and 8–12 (Byers & Wilcox, 1991, p. 66). Thus, each focus group included ten students from each of five grades (fourth, fifth, sixth, seventh, and eighth). In total, 50 students across different grades participated the study. Izollu Primary School is located in Kale, a district of Malatya province in the eastern part of Turkey. The school was equipped with IWBs during the initiative of the district governorship. When the data for the research was collected during the second semester of 2010–2011 school year, the school was one the three schools with IWBs in all classes as far as the researcher was informed by the authorities in Provincial Directorate of Education.

2.3 Data collection and analysis procedures

Research data was collected using focus group interviews. Focus groups can be used “to gain unique insight into existing beliefs, behaviors, and attitudes” (Byers & Wilcox, 1991, p. 71). Interaction among group members characterizes focus group interviews (Creswell, 2007; Kress & Shoffner, 2007; Wilson, 1997). Thanks to this interaction focus groups provide high quality data in a social context where people can consider their own views by hearing the views of others (Fraenkel, Wallen, & Hyun, 2012; Patton, 2002). Thus one can “promote talk on a topic that informants might not be able to talk so thoughtfully in individual interviews” (Bogdan & Biklen, 2007, p. 109). Also groups must be formed homogeneously, i.e., with people of similar backgrounds and experiences (Patton, 2002). In this respect, researchers’ main reason for choosing focus groups instead of individual interview was to yield rich data by utilizing the group interactions among homogeneous and cooperative students from the same classes.

The interview protocol was designed to include explanations about the researchers’ identity, the purpose of the study, what the students are expected to do during the interviews, and finally the interview questions. Inspired by Beeland (2002), Hall and Higgins (2005), and Levy (2002), researchers formulated three open-ended semi-structured research questions: What do you like the most about having IWBs in your classes?, What do you like the least about having IWBs in your classes?, and (How) does instruction with an IWB enhance your learning? Probe questions were also asked when necessary to deepen students’ answers further. First researcher played the role of both moderator and interviewer, refraining from contributing to the discussions to increase objectivity (Byers & Wilcox, 1991), facilitating interaction between students, drawing out differing viewpoints, and keeping the session focused to obtain valid and rich data (Fraenkel et al., 2012). Second researcher helped recording the interviews digitally. The interviews took more than one lesson hour (50–55 min). The entire process was recorded digitally.

The transcribed data was then imported in Nvivo 9 qualitative data analysis software. The qualitative data was analyzed in three consecutive steps defined by Miles and Huberman (1994, p. 10): data reduction, data display, and conclusion drawing/verification.

In the first step, analytic choices were made in consideration with research questions by deciding about which data chunks to code and exploring the patterns that best summarized a number of chunks (Miles & Huberman, 1994, p. 11). In other words, clusters of meaning were developed from participants’ significant statements into themes (Creswell, 2007, p. 61). In clustering the meanings out of the data set and naming the themes, a combination of deductive and inductive analysis was used. Since the existing IWB literature provides a general framework about advantages and disadvantages of IWB use in education, the analysis was rather deductive, i.e., according to the existing framework in the literature (Patton, 2002, p. 453). Still some of the patterns or themes (e.g. test based use) were inductively discovered and named by the researchers.

The next step, data display, included assembling “organized information into an immediately accessible, compact form” (Miles & Huberman, 1994, p. 11) to see the big picture for the successive top–down bottom–up analysis process or to facilitate drawing conclusions in the next step. The reduced data on which researchers’ conclusions were based was also displayed in matrices by grades.

Finally, at the conclusions/verification step, answers to research questions were presented and discussed. They were verified by comparing final conclusions with participant statements and by argumenting and reviewing the themes among two colleagues to develop “intersubjective consensus” (Miles & Huberman, 1994, p. 11).

To test the reliability of the analysis, interrater reliability was estimated. For this purpose, the content coded by both researchers into five randomly selected themes was compared using Cohen’s Kappa coefficient, which revealed results ranging from 0.87 to 0.95 indicating almost perfect agreement (Sim & Wright, 2005, p. 164). Furthermore, to increase the interpretive validity (Maxwell, 1992) findings were reported with a critical approach i.e., trying to interpret what the participants mean with regard to research questions. Interpretations were frequently justified with direct quotations from participants.

3. Results and discussion

3.1 What students like the most about instruction with IWB

The analysis of the interview content revealed basic categories about the most appealing properties of IWB use in their lessons. These categories were listed in Table 1 from the most referred to the least along different grades.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Number of references by class (f)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Practical and economical use</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>2. Better visual presentation</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>3. Test-based use</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>4. Hygiene</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>5. Saving time</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6. Multi-media</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>7. Better learning</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
<td>24</td>
</tr>
</tbody>
</table>
It was found that students, especially the fourth graders, referred primarily to the practical and economical use of IWBs as the most liked feature. This category covered the ability to write on and erase from the board without noise or physical pressure unlike with a chalkboard ["It is easy to write on an IWB. . . . also you don’t have to press the pen firmly on the board" (Fourth grade)]. Students also praised the practical functions like copy-pasting and recalling the previously displayed pages ["If we can’t understand something we click to review the content again" (Eighth grade)]. This flexibility and ease of using IWBs was commonly seen as an advantage or strength both by teachers and students (Al-Qirim, 2011; Elaziz, 2008; Schuck & Kearney, 2007). The economy IWBs provided also appealed to the students significantly ["Teachers no more need to photocopy tests for all students, but display it on IWB" (Fifth grade); "Teachers used to ask us to buy isometric dot papers, pencils etc., but not anymore" (Seventh grade)]. This finding can be a counter-argument against the supposition that investing in IWBs is costly (Higgins et al., 2007; Slay et al., 2008; Smith et al., 2005).

The second most appealing feature of the IWBs was the better visual presentation ability it offers. Students, especially fourth graders again, stressed that they like seeing accurate geometrical shapes or illustrations in different colors ["Blackboards were limited to white or yellow chalks, but now we can choose among a number of colors" (Fourth grade)]. Lastly, students liked vivid photographs ["We liked the photos from museums" (Fourth grade)] and more legible writing on the board. The visually rich presentation feature of IWBs was previously reported to be the primary reason for increased student engagement (Beeland, 2002), the most referred advantage of such technologies (Slay et al., 2008, p. 1332), the most enjoyed feature (Hall & Higgins, 2005), or a strongly motivating feature (Glover et al., 2005; Smith et al., 2006).

Test-based use of IWBs also seemed to please all students, especially fifth graders. To put it precisely, students liked seeing as many test items as possible on the board retrieved from various resources including the internet and working on them ["Formerly teacher couldn’t display as many test items on the blackboard as now" (Fifth grade)].

Students also appreciated the hygiene IWBs offered. They were pleased that their hands or clothes were not dirtied with chalk dust and they did not have to inhale it anymore ["Chalk dust might have made us sick, but not anymore" (Fourth grade)].

The IWB’s help in saving instruction time was reported by sixth and seventh graders as one of the best features. This idea was represented either in the form of covering as much content as possible in one lesson ["While teachers used to finish only one topic, thanks to IWB she can teach several topics in one lesson" (Sixth grade)] or avoiding time wasting burdens such as writing/drawing on the board during a lesson, which was also reported in previous research (Miller, 2003). It must be noted that covering more content in one lesson or having a fast lesson pace does not necessarily mean better comprehension or motivation. As a matter of fact, some students might also complain about the fast pace of teachers using IWB (Wall et al., 2005). In a similar vein, Smith et al. (2006) warn that the faster pace of the lessons with IWBs can be at the expense of more protracted pupil answers.

Only mentioned by fifth and sixth graders, the multimedia feature was another but relatively less appreciated ability. Students stated that they liked the rare times when they watched videos and listened to audios ["Once we watched an experiment on an internet video. It was lovely" (Sixth grade)]. While there is well documented literature (Adigüzel et al., 2011; Elaziz, 2008; Gursul & Tozman, 2010; Hall & Higgins, 2005; Levy, 2002; Slay et al., 2008; Smith et al., 2005) suggesting multimedia as a major advantage of or most liked feature of IWBs, it is interesting that most students in the present study were not aware of the multimedia feature as it had been used rarely.

Lastly, students from fourth and fifth grade admitted that they liked instruction with IWB because in this way they learned better ["We comprehend our lessons better" (Fifth grade)]. Though it is the least referred to most-appreciated feature of IWBs, other research findings show both students and instructors emphasize the facilitation/improvement of the learning process with IWBs (Elaziz, 2008; Kaya & Aydin, 2011; Levy, 2002; Wall et al., 2005) and enduring learning outcomes (Altançelik, 2009; Gursul & Tozman, 2010).

3.2. What students like the least about instruction with IWB

The analysis of the interview content revealed basic categories about the least appealing properties of IWB use in their lessons. These categories were listed in Table 2 from the most referred to the least across different grades.

Compared to the favorable ones, references regarding the least liked features of IWBs were less in number and variety mostly falling into the technical problems category. Students from all focus groups, especially the fifth graders, were uncomfortable with the interruptions and distractions caused by technical problems such as power cuts, unintentional shut-downs, impaired color settings (black-and-white or improperly colorful screens), a virus program constantly blocking the screen, and decalibration. Among these, decalibration seemed to be the most disturbing technical problem. This problem was actually described by the students as a failure to write/draw exactly where one intended on the board surface ["You fix the pencil here but it writes another place up or down" (Fifth grade)]. This orientation problem is also one of the most commonly reported technical problems in the literature, mainly resulting from physical contacts like bumping (Beeland, 2002) or moving/displacement (Gursul & Tozman, 2010; Smith et al., 2005) and causing fuzzy and unreadable texts (Hall & Higgins, 2005) and time-consuming recalibration (Elaziz, 2008; Gursul & Tozman, 2010; Wall et al., 2005). In effect, this frequent mention of a failure to write accurately on the board due to calibration problems may point to a common concern among teachers who are at the early stages of transition to this technology (Beauchamp, 2004). On the other hand, other technical problems such as freezing, breaking down, power cuts, low voltage, and malfunction of the computer connected to the IWB (e.g. auto-virus scans, receiving error notifications) have been commonly reported by teachers and students as well (Al-Qirim, 2011; Somyürek et al., 2009; Wall et al., 2005).

Table 2

Distribution of references by class into themes about what students like the least regarding instruction with IWB.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Number of references by class (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class 4</td>
</tr>
<tr>
<td>1. Technical problems</td>
<td>9</td>
</tr>
<tr>
<td>2. Health problems</td>
<td>0</td>
</tr>
<tr>
<td>3. Inexperienced teachers</td>
<td>0</td>
</tr>
<tr>
<td>4. Sunlight shining</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
</tr>
</tbody>
</table>
Categorized as a health issue, some students complained about watering and irritation in their eyes as a result of looking at the IWB screen for a long time ["When we concentrate on the board for long, our eyes pain" (Eighth grade)]. Some other students also expressed their concerns about possible long-term effects of the radiation from IWBs. Previous research also reported primary school students’ concerns about similar health problems including “headaches, sore eyes, and epileptic fits” (Wall et al., 2005, p. 865).

Inexperience of teachers to use IWBs was another – though a minor-category of dislike mentioned only by eighth graders. Students described how their novice teachers faltered while using IWBs ["Sometimes we have to show the basics to those teachers who know little about how to use an IWB” (Eighth grade)]. It is frequently reported that teachers need the technical skills to use IWBs effectively (Elaziz, 2008; Hall & Higgins, 2005; Lewin et al., 2008; Shenton & Pagett, 2007; Slay et al., 2008; Smith et al., 2005; Wall et al., 2005) and lack of them is perceived negatively by students (Levy, 2002), whereas in this school this problem was considered a minor one. This could be because teachers were already very competent users of IWBs or because only very basic functions of them were used, i.e., they were underutilized. The latter reason seems more reasonable, considering the findings regarding how limited the IWBs use was (see 3.4. The extent to which IWBs are used to their fullest potential).

Lastly, as one of the common problems reported in the relevant literature (Al-Qirim, 2011; Ates, 2010; Elaziz, 2008; Hall & Higgins, 2005; Levy, 2002), the sunlight reflecting on the screen causing poor visibility was the least extensive item in the list [“We can not see the full screen… due to the sun light” (Sixth grade)].

3.3. How instruction with IWB enhances students’ learning

The analysis of the content from focus group interviews revealed views about how instruction with IWB facilitates students’ learning. Resulting categories were listed in Table 3 from the most referred to the least across different grades.

Students, especially the fifth and sixth graders, believed that learning happened better since the IWBs helped visualizing and contextualizing the subject matter better. Students mainly highlighted how representative and retainable the vivid and colored visuals were unlike the visuals on traditional boards ["I was able to understand the human circulation system clearly distinguishing the arteries and veins, red and white blood cells thanks to clear and colored visuals on the IWB” (Sixth grade)]. As also reported in previous research, the visual display of information on IWBs is one reason for facilitated learning and assisted remembering as perceived by primary pupils (Altınçelik, 2009; Wall et al., 2005). Participants also stressed that internet resources like slides and videos, though used rarely, facilitated their understanding via contextualization of abstract concepts or ideas in science and math lessons ["We have just learned the buoyancy of water on a video teacher showed in the internet” (Eighth grade)] as seen in previous research (Levy, 2002; Murcia, 2008; Wall et al., 2005).

As a matter of fact, students, especially eighth graders, seemed to believe that better visualization and contextualization was one natural result of the effective presentation utility IWBs offered for teachers. To put it clearly, in students’ views, teachers could effectively exploit different sources ["There are puzzles, slides, posters from the internet or CDs … they are rich sources” (Eighth grade)], thus clarifying many subjects ["We actually understand but more sources help us consolidate more” (Eighth grade)] by managing the time better ["It usually took time for teacher to draw a polygon on the normal board, on the IWB she shows ready-made ones quickly” (Seventh grade)]. Though the ability to access various sources is documented as a strength of IWBs (Ates, 2010; Digregorio & Sobel-Lojeski, 2010; Elaziz, 2008; Hall & Higgins, 2005; Levy, 2002; Serow & Callingham, 2011) it should be noted it is an ability facilitated by the internet connection or CD player utility of the adjacent computer, not by the IWB itself.

Also referred to as one of the most-liked features of instruction with IWB, test-based use of IWBs was mentioned as a way of effective learning by all focus groups. Taken in connection with the findings from the first research question, students both liked answering multiple-choice questions and believed they learned better when they worked on tests on IWBs in various courses including math, science, social studies and Turkish language to get prepared to national exams ["Sometimes we have to show the basics to those teachers who know little about how to use an IWB” (Eighth grade)]. It is frequently reported that teachers need the technical skills to use IWBs effectively (Elaziz, 2008; Wall et al., 2005, p. 865).

In addition to these cognitive reasons, motivation, as an affective factor, was the third most mentioned contribution by instruction with IWB to enhanced student learning. Students agreed that IWB on its own aroused interest and curiosity ["Everybody was excited when IWB was first launched” (Eighth grade)] and the activities done on IWB were enjoyable ["Listening to English songs on IWB was enjoyable” (Fourth grade)]. The components of fun and interest are also well documented in both national (Altınçelik, 2009; Gursul & Tozman, 2010; Popham, 2001; Semerci, 2004) and international (Beeland, 2002; Hall & Higgins, 2005; Levy, 2002; Serow & Callingham, 2011; Slay et al., 2008; Wall et al., 2005) literature.

Lastly, it was also found that this motivation led to increased student participation and interaction ["It is enjoyable and everybody wants to join to activities” (Seventh grade)], a finding consistent with several other research (Beeland, 2002; Elaziz, 2008; Gursul & Tozman, 2010; Kaya

Table 3

<table>
<thead>
<tr>
<th>Categories</th>
<th>Number of references by class (f)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class 4</td>
</tr>
<tr>
<td>Visualization and contextualization</td>
<td>5</td>
</tr>
<tr>
<td>Effective presentation</td>
<td>0</td>
</tr>
<tr>
<td>Test-based use</td>
<td>2</td>
</tr>
<tr>
<td>Motivation</td>
<td>2</td>
</tr>
<tr>
<td>Student participation and interaction</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
</tr>
</tbody>
</table>
This participation included not only raising hands or answering teacher directed questions, but some hands-on tasks, though very limited, such as matching, dragging or measuring ["We can measure the angles of the shapes we draw on the board" (Fourth grade)]. This physical interaction, including hands-on tasks, cannot only positively impact the learning needs of learners with tactile modalities (Beeland, 2002) but also motivate the students in general (Smith et al., 2005) and help them learn better (Shenton & Pagett, 2007). As a matter of fact, this age group needs hands on activities, and students prefer having sufficient opportunity to use the IWB themselves for better learning (Hall & Higgins, 2005; Preston & Mowbray, 2008; Slay et al., 2008; Wall et al., 2005). But, relatively little mention of such interactive activities indicates the restriction of learners’ access to IWB, a problem frequently stated by learners (Al-Qirim, 2011; Hall & Higgins, 2005; Shenton & Pagett, 2007).

3.4. The extent to which IWBs are used to their fullest potential

Focus group interviews about the three general questions of this qualitative study (e.g. What do the students like the most and the least about instruction with IWBs? and How does instruction with IWB enhance their learning?) revealed vivid answers to another question that was not voiced until the analysis of the students’ views: To what extend the IWBs are utilized to their fullest potential? Surprisingly, what students seemed to like about IWBs or what they believed to be the contribution of IWBs to enhanced learning cannot actually be attributed to the peculiar features of IWBs. Those functions including practical and economical use (e.g. copy-pasting and recalling the previously displayed pages, the economy IWB provides), better visual presentation (e.g. accurate geometrical shapes or illustrations in different colors), test-based use (i.e., displaying and solving as many test items as possible), saving instruction time (e.g. avoiding time-wasting burdens such as writing/drawing on the board during lesson), multimedia (e.g. watching videos and listening to audios), visualizing and contextualizing (e.g. using representative and retainable vivid and colored visuals), or effective presentation (i.e., teacher’s effectively exploiting different sources, clarifying many subjects by managing the time effectively) are typical features of the combination of computer, projection and the internet technologies. Even students were aware that sometimes IWB was used simply as a projection surface ["When the special pen fails, we keep on writing with a board marker on the white surface formed by closing the lids of the SB" (Sixth grade)]. On the other hand, those properties unique to IWBs such as tactile dragging, matching, ticking, expanding, painting, or playing games etc. were mentioned to be never or rarely used, which means IWBs are under-used after being reduced to a projection or a writing surface (see Glover et al., 2005; Murcia, 2008). This finding is similar with research findings suggesting that what students or teachers do with IWBs can be simply done on a blackboard/whiteboard (Digregorio & Sobel-Lojeski, 2010; Gursul & Tozman, 2010; Levy, 2002) or with a computer and projector (Slay et al., 2008) instead. When the function of IWBs are restricted to providing a surface for projected images, the very precious motivational interactivity feature and potential impact on learning would be sacrificed (Armstrong et al., 2005; Beauchamp & Kennewell, 2010; Lewin et al., 2008), and it causes disappointment and frustration among students (Levy, 2002).

Though some students highlighted its importance for enhanced learning, the level of students’ interaction and participation was found rather limited. To illustrate, students did not mention about taking the responsibility of their own learning by using the IWB as part of planned activities within lessons such as “using the pen to highlight (e.g. circling an error in text) or drag items (e.g. words to be added in cloze exercises)”, which characterizes the quality of interaction as defined by Beauchamp (2004, p. 335) at later stages of apprenticeship level. Also there was no mention of a kind of dialectic interactivity where IWBs are used as a place on which students show and justify their ideas to the class in response to the teachers’ questions (Beauchamp & Kennewell, 2010). Neither were there views about creating an engaging task environment to help and support the pupils in cognitive and meta-cognitive activities, which Warwick, Mercer, Kershner, and Staarman (2010, p. 358) defines as scaffolding. Instead, students were found to like and praise (in terms of enhanced learning) the teacher-centered use of IWBs (e.g. practical and economical use, better visual presentation, visualization and contextualization, saving-time, test-based use etc.) more. This perception implies that IWBs were regarded primarily as a fast and effective presentation tool by teachers, which suggests that teachers are still at an initial stage as an apprentice as defined by Beauchamp (2004), which is characterized with teachers transferring their special computer skills into IWB lessons and a limited use of external materials via the IWB, which then serves mainly by itself will not bring about fundamental change in the traditional patterns of whole class teaching” (p. 455). Also as stressed by Ates (2010) there seems to be a risk of using IWBs to overload the students in order to complete the curricular content sooner.

Considering the frequent mention of technical problems and faltering by inexperienced teachers as the unpleasant aspects of IWB use in lessons, some teachers can even be at the pre-initial stage of integrating IWB to their classrooms. As a matter of fact, this early stage is characterized with retreatism and lack of technical skills special for IWB (Serow & Callingham, 2011).

4. Conclusions and recommendations

This study was aimed at investigating the views of primary students about IWB use in their classes from attitudinal and pedagogical perspectives, to evaluate the quality of instruction done using IWB by defining potential weaknesses and strengths, and thus to explore the association between attitudinal perspectives and quality of instruction done using IWB. The results indicated that what students liked the most about instruction with IWB included (in the order of importance) practical and economical use, better visual presentation, test-based use, hygiene, saving time, multi-media use, and better learning. Students were positive and motivated about instruction with IWB except for the interruptions and distractions caused by technical problems that frequently occur in the form of decalibration, power cuts, unintentional shut-downs, impaired color settings (black-and-white or improperly colorful screen), and a virus program constantly blocking the screen. From a pedagogical perspective, students were found to believe that instruction with IWB enhanced their learning thanks to such factors as (in the order of importance) visualization and contextualization, effective presentation, test-based use, motivation, and student participation and interaction.

Most significantly it was found that although interactivity is one of the unique properties of IWBs, it was found to be the least referenced feature. Paradoxically, most of the other factors that students pedagogically justified to enhance their learning were also inherent in computer-projector-internet technologies, without a need for IWBs. This implies that IWBs were not used to their full potential. Like the pedagogical justifications, student statements about attitudinal factors (most liked features) regarding IWBs use in general can be better
attributed to computer–projector–internet setup. As previous research stressed that students’ positive feelings can be attributed to IWBs’ novelty (Moss et al., 2007; Schuck & Kearney, 2007; Serow & Callingham, 2011; Slay et al., 2008). Moreover this motivation can be short-lived (Higgins et al., 2007; Levy, 2002; Moss et al., 2007) and cannot always feed desired academic learning gains (Digregorio & Sobel-Lojeski, 2010; Moss et al., 2007). As a matter of fact, it is questionable whether increased teacher or student motivation (Higgins et al., 2007) or changed teaching and learning approaches (Glover et al., 2005) have a positive impact on achievement. Thus, either the decrease in motivation in time or poor learning outcomes should not be attributed to IWB itself but to the failure to blend technology and pedagogy. As a recommendation, to achieve the potential gains from this initial interest or motivation, technology and pedagogy (approach) should be blended accordingly (Beauchamp, 2004; Serow & Callingham, 2011; Türel & Demirli, 2010; Warwick et al., 2010). In Mercer et al.’s (2010, p. 207) words, the IWB is “the servant of pedagogy and not its master”. For example, instead of predominantly using IWBs for test-based purposes as found in this study, young children can be enabled to show their understanding of concepts and recall experimental procedures using interactive activities/tasks on IWBs for formative assessment purposes as suggested by Preston and Mowbray (2008).

On the other hand, as justified by Somyürek et al. (2009), lack of curricular pedagogical software can cause the under- or limited utilization of many of the features IWB technology. As a matter of fact, IWB applications rely on the software installed and used on the adjacent computer (Digregorio & Sobel-Lojeski, 2010). The need for such material is frequently reported by teachers (Gursul & Tozmaz, 2010; Levy, 2002; Moss et al., 2007). Thus the provision of such accredited curricular software can ensure that teachers learn how to use IWBs more effectively and gradually become synergistic users as defined by Beauchamp (2004), which is characterized with a combination of teacher’s and pupils’ “joint technical skills and teacher’s pedagogic vision to create a new learning prexis” (p. 343).

References


