TEACHERS' AND STUDENTS' PERCEPTIONS OF INTERACTIVE WHITEBOARDS IN THE ENGLISH AS A FOREIGN LANGUAGE CLASSROOM

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ABSTRACT
This article reports on the findings of a study conducted to investigate teachers' and students' perceptions of interactive whiteboards (IWBs) in the English as a foreign language (EFL) classroom and to find out differences of perceptions according to some variables such as gender, level of English proficiency, hours of weekly IWB use, and years of teaching experience. Two self-report questionnaires were used to gather main data from 58 EFL teachers and 164 EFL students in a private Anatolian high school in Ankara where IWBs were installed and actively operated by teachers in classrooms. The student questionnaire consisted of 26 five-point Likert-scale items to measure the student's perceptions about (1) *Perceived Learning Contribution*, (2) *Motivation*, (3) *Perceived Efficiency*, and (4) *Perceived Negative Effects*, whereas the teacher questionnaire included 25 five-point Likert-scale items to measure their perceptions about (1) *Instructional Effects of IWBs*, (2) *General Attitudes*, (3) *Motivational Effects of IWBs*, and (4) *Need for Training*. Quantitative data was further supported by qualitative data gathered from teachers through open-ended questions. The findings revealed that overall both teachers and students have favorable perceptions of the IWB technology and its benefits in EFL classrooms. However, the results of t-test and One-way ANOVA tests showed no significant difference in the teachers' perceptions of IWB use with respect to their gender and years of experience. Female and male students did not have any significantly different perceptions of the IWB technology either. However, the results of One-way ANOVA revealed that students differ in their perceptions according to their level of English proficiency and hours of weekly IWB use. Another finding indicated that teachers with more years of teaching experience had more favorable perceptions of IWBs than less experienced teachers and that teachers who use IWBs more frequently have more positive perspectives on the use of the IWB technology. Similarly, it was found that the more students got involved in using IWBs, the more their perceptions changed favorably. The results of qualitative data also supported the findings of teachers' self-reported perceptions in relation to the general attitudes on the pros and cons of IWB use in EFL classrooms. Another major finding of the study revealed that teachers need training for this technology in order to acquire the essential competencies in pre-service and in-service training programs. Further research in this area could be an investigation of pedagogical approaches to integrate IWBs in the EFL classroom.

Keywords: Interactive whiteboard; Teachers' perceptions; Students' perceptions; English language teaching (ELT); Foreign/second language (L2) teaching and learning

INTRODUCTION
Over the last decade there has been a growing interest in the use of information and communication technologies (ICT) in education in general and second or foreign (L2) teaching and learning in particular. Indeed, the amount of monetary resources invested in educational technology as well as the rhetoric of official publications in support of ICT integration indicates that many schools and governments in the developed and developing countries have confidence in the abilities of ICT to enhance educational processes (Bax, 2000; Betcher and Lee, 2009; Moss et al., 2007; MoNE, 2010; Thomas and Schmid, 2010; Yang and Teng, 2014). In fact, there is overwhelming evidence confirming the notion that ICT has greatly transformed the educational operations and processes in many contemporary institutions (Duran and Cruz, 2011; Thomas & Schmid, 2010). L2 learners in the present day schools are provided with numerous opportunities to interact in online virtual life occurrences by the use of technology such as multimedia resources and the internet. By being allowed an opportunity to engage in online virtual encounters, L2 learners are presented with a chance to develop and broaden their intellectual and communication skills (Coyle, Yañez and Verdú, 2010; Millum and Warren, 2014) as well as critical cultural awareness (Byram, 1997). In turn, this connects the educational institutions to the world around them by making intercultural contact more effective.

In line with the aforementioned developments, faith and motivation in ICT, there has also been an ever increasing interest in utilizing interactive whiteboards (IWB) in classrooms as this technology is perceived as combining all pre-existing instructional aids such as chalkboard, whiteboard, television, video, overhead

projector, CD player, and computer (Yáñez and Coyle, 2011, p. 446). Even though the IWB technology is relatively a new phenomenon as it was originally designed for commercial settings (DiGregorio and Sobel-Lojeski, 2010; Higgins, Beauchamp and Miller, 2007), it is increasingly utilized in language classrooms all over the world. As also indicated by Coyle, Yañez and Verdú (2010), it provides L2 teachers with many opportunities to teach in novel, exciting and promising ways that go far beyond the possibilities of traditional boards. On these grounds, it can be argued that IWBs are now a fact of everyday life as governments, school managers and directors also perceive them as a "must have" device "to keep up to date and to be seen as having the latest equipment" (Hockly, 2013, p. 356).

On the other hand, technology alone is not a panacea in L2 teaching and learning (Johnsona, Ramanaira and Brineb, 2010). In fact, there is not enough empirical research evidence regarding the effectiveness of the IWB technology in L2 teaching and learning. According to Hockly (2013), for example, there is not much reference to any specific improvements in student attainment due to the use of the IBWs in the language classroom. Furthermore, in their recent meta-analysis research into the use of technology in L2 teaching in the primary and secondary sectors, Macaro, Handley and Walter (2012) indicated that there is slight and inconclusive evidence that technology has a direct beneficial impact on linguistic 'outcomes', "but it may impact indirectly and positively on learner attitudes and behaviours and may promote collaboration" (p. 1). This assertion is supported by the findings of educational researchers who report that students and teachers have or develop positive attitudes toward the IWB (Elaziz, 2008; Levy, 2002; Hall and Higgins, 2005; Türel, 2011; Türel and Johnson, 2012) and that it increases interest and motivation among students and teachers (Mathews-Aydinli & Elaziz, 2010; Johnsona, Ramanaira and Brineb, 2010). Consequently, the overall aim of this study is to explore teachers' and students' perceptions of the IWB technology use in teaching and learning English a foreign language (EFL). It also aims to investigate whether there are differences of perceptions in terms of some variables such as gender, proficiency level and years of teaching experience.

LITERATURE REVIEW

An IWB is commonly defined as a system made up of a computer connected to a data projector and a board. It is a large, touch-sensitive, interactive display system that forms a link between a teaching surface and a digital projector and computer (BECTA 2003; De Vita et al., 2014; Miller and Grover, 2010). In addition to being large and very touch sensitive, the board exhibits the projected representations and allows the teacher and students to manipulate them. An average IWB has the capacity to transmit information from the board to the computer immediately after the screen is touched (Duran and Cruz, 2011). While most IWBs are designed to have a pen and software comprised of dragging and dropping abilities, some IWBs may be operated by using a finger.

IWBs can have many positive effects on teaching and learning in general. For teachers, for example, during regular class hours they provide the opportunity to integrate more ICT into lessons, enable teachers to utilize a wide range of web-based resources, and encourage them to save and print their notes that they make during lessons. Moreover, IWBs have the potential to increase student enjoyment and motivation, to provide more opportunities for student participation and cooperation by developing students' personal and social skills, and to promote students' creativity when they engage in giving presentations in front of their peers (see BECTA, 2003 for details).

Several other benefits can be associated with the utilization of IWBs in L2 teaching and learning. For example, Schmid and Schimmack (2010, p. 198) describe four educational benefits of using the IWB technology in L2 classrooms: a) facilitating the integration of new media in the regular language classroom, b) enhancing the scope of interactivity and learner engagement in the lesson, c) supporting the development of so-called "electronic literacies", and d) meeting the needs of students with diverse learning styles (aural, visual and kinesthetic) through the use of multiple media. Similarly, (Gray, 2010, p. 71) points out that the IWB has "the capacity to facilitate more individualized styles and rates of learning." Thus, it is fair to suggest that students who make use of this technology are more independent and possess a sense of direction. According to Duran and Cruz (2011), L2 learners in IWB classrooms are more attentive, engaged, and supportive of each other since they find the lessons more interesting and fun. Finally, Beeland (2002) points out that use of the IWBs in L2 classrooms is very effective in enhancing and increasing the levels of learner engagement in the teaching and learning activities.

In spite of the benefits of IWBs in classrooms, there are also some challenges that the use of IWBs may pose in L2 teaching and learning. These challenges often consist of technical issues such as the breaking down of IWBs (Thomas & Schmid, 2010; Armstrong et al., 2005), high cost of IWBs (Elaziz, 2008; Thomas & Schmid, 2010), lack of teachers' confidence and ICT skills in using IWBs (Hall and Higgins, 2005, Levy, 2002; Smith, Higgins, Wall and Miller, 2005), extra time required for teachers to plan and prepare materials (Gray, Hagger-Vaughan,

Pilkington and Tomkins, 2005; Thomas & Schmid, 2010), and special training required for teachers to appropriately use IWBs and to support their selection of appropriate software (Isman, Abanmy, Hussein and All-Saadany, 2012; Thomas & Schmid, 2010; Armstrong et al. 2005; Gray et al., 2005; Hall and Higgins, 2005; Levy, 2002; Moss et al., 2007). Of these challenges, language teachers' training for IWB use seems very significant in order to make the most of this technology. In fact, teachers must be proficient and well-trained in using IWBs. According to Betcher and Lee (2009), effective IWB teaching requires that the teacher be organized, interactive, flexible, constructive, willing to share their knowledge, open-minded, and ready to create teaching and learning plans.

Even though IWBs bring about some challenges, it seems that the underlying argument in favor of IWBs often relates to positive perspectives, interest and motivation among students and teachers. For example, in a study by Moss et al. (2007, p. 53), it was discovered that both the teachers and learners in classrooms had generally favorable attitudes towards the use of the IWB technology. Most respondents reported that the major benefits of the IWB technology emanated from the increased quality of display of the educational content being taught or learned. Smith, Higgins, Wall and Miller (2005) argue that the ease of usability and the versatility of the technology play an important role in attitudes towards the use of the IWB technology. Their study indicated that learners favored the IWB technology since they found a computer keyboard and mouse difficult to handle and operate. Some learners also favored the technology since it assisted them in improving their handwritings. On the other hand, Türel and Johnson (2012) examined teachers' beliefs and use of the IWB technology for teaching and learning in Turkish primary and high schools. Their findings revealed that in order to facilitate learning and instruction teachers should engage in the IWB use more frequently, collaborate with colleagues and get training on effective instructional strategies regarding the IWB use.

In addition to the aforementioned research into the overall use of the IWB technology in education, studies into teachers' and learners' perspectives on IWBs in L2 teaching and learning have come to emerge. For example, Matthews-Aydinli and Elaziz (2010) carried out a study in order to determine the attitudes and opinions of EFL learners and teachers in Turkey on the use of IWB technology. Reportedly, both the students and teachers indicated positive attitudes towards the IWB technology. Believing that the technology was beneficial in language learning, both teachers and students were comfortable in using the device. Similarly, the findings of a study by Duran and Cruz (2011) revealed that learners were more motivated and liked lessons in which IWBs were used since these lessons were "quicker, more fun, and more exciting". In addition to this, Barber et al. (2007) state that learners in classrooms where the IWB technology was utilized were more attentive, supportive, and encouraging to each other when one of them was at the board operating the technology. Such research reports are also supported by a recent study that investigated the perceptions of a teacher and students of the effectiveness of the IWB in facilitating various aspects of Chinese language learning (Xu and Moloney, 2012). However, Duran and Cruz (2011) assert that a positive impact in L2 teaching and learning does not depend so much on the devices and technology utilized in the process as on the manner in which the tools and technologies are utilized. Teachers can only make effective use of IWBs if they have a positive attitude towards the technology.

Another recent study by Coyle et al. (2010) investigated the impact of IWBs on the language use of a primary school teacher and a group of native and non-native speaker children in an English language immersion classroom. Their findings revealed that even though the teacher created opportunities for the children to engage in tactile interaction with the board by taking advantage of multimedia presentations in Numeracy and Literacy, opportunities to participate in the dialogic interaction beyond the production of one or two word utterances were limited and largely restricted to the NS children in the group. In another study that investigated L2 learners' perceptions of learning with IWBs, Yáñez and Coyle (2011) conducted a small-scale study that focused on an English language immersion classroom in a British primary school in Spain. Their findings indicated that children desired to interact more with the IWB and that its multimodal properties were important and appealing to particularly the non-native speakers (NNS). On the other hand, Johnsona et al. (2010) indicated that although a majority of learners and teachers in language classrooms appreciate the benefits of IWBs, they are convinced that it is not necessary for them to learn or teach language more effectively. Likewise, Schmid and Schimmack (2010) investigated the attitudes of teachers towards the use of IWB and technology in language classes and found out that in spite of naming a few benefits of the technology, all of the teachers engaged in the research reported that the use of IWB technology did not enhance their teaching in a significant manner. According to the teachers, the gains of IWB technology, such as accessing the internet easily, could be enjoyed by using simpler alternatives such as computer-projector systems.

In a most recent study carried out in Turkey, Toscu (2013) investigated the relationship between classroom interaction and IWB use in tertiary level EFL classes and compared the types of interaction patterns that

occurred in classes equipped with either IWBs or traditional whiteboards. Her findings indicated that there were not any significant differences of interaction patterns, neither positive nor negative, between the IWB and the non-IWB groups of L2 learners and teachers. Her research implies that the IWB technology alone does not play a crucial role in promoting L2 classroom interaction. Consequently, the findings of these studies demonstrate that teacher training for IWBs should be given priority and based on such technological and pedagogical principles as learning how to effectively manage the IWB as a teaching resource, developing a critical and creative attitude toward software or materials designed to promote learning and, particularly, learning how to promote active participation and interaction in the language classroom (Yáñez & Coyle (2011).

Given the fact that the IWB has been a fact of life in the present school contexts, current research appears to validate the view that L2 teachers need special training and skills in the effective use of IWBs in the language classroom. According to Schmid and Schimmack (2010), a major impediment to the utilization of technology such as IWBs in language classrooms is the fact that the language teachers are not sufficiently trained to integrate the technology into their language teaching and learning activities. A majority of the training sessions provided for language teachers on the integration of technology are usually one day workshops which neither accord the teachers sufficient time to learn nor offer follow-up services to the school and classroom levels. This view is supported by Schmid (2010) who investigated the new competencies that EFL teachers need to acquire in order to be able to use IWBs to develop their practice. The results of her study demonstrated that various competencies are required to integrate the technology into teaching: (a) the ability to design IWB-based materials which support opportunities for learner interaction with the whiteboard and with the learning content; (b) the appropriate management of interaction around IWBs in a way that ensures all learners are provided with opportunities to become actively involved; and (c) the ability to find the 'right balance' of technology use. This means that investment in good-quality teacher training is essential and especially pre-service language teacher education programs play a central role in enabling teachers to use the IWB technology towards a socio-cognitive approach to technology enhanced language teaching. On these grounds, it can be argued that training for IWB use should start in pre-service L2 teacher education programs and continue in in-service training programs as part of Continuing Professional Development (CDP).

Overall, the current literature on teachers' and students' opinions, attitudes and perceptions about the IWB use reveals that both students and teachers usually have positive reactions to this technology. The consensus view seems to be that although there is not any reference to specific improvements in the "linguistic outcomes" of students due to the use of the IBWs in the language classroom, this technology may have some potentials to promote students' and teachers' interest and motivation in L2 (DiGregorio & Sobel-Lojeski, 2010). The rapidly growing literature on the IWB use also indicates that L2 teachers need some competencies to acquire and training in order to integrate this technology in their language classrooms. In addition, there have been very few studies into learners' and teachers perspectives on the IWB technology in L2 teaching and learning in Turkey ever since MoNE (2010) embarked on the FATIH Project in order to "enhance opportunities" and since most private schools launched the IWB technology in their classrooms long ago. Finally, research reports and studies do not reveal any specific information about some factors such as gender, teaching experience and proficiency level, which the present study intends to address.

THE PURPOSE OF THE STUDY

This study was primarily conducted to investigate teachers' and students' perceptions of IWBs in the EFL classroom and to find out whether there are differences of perceptions in terms of some variables such as gender, proficiency level, hours of weekly IWB use, and years of teaching experience. Thus, the study was designed to address the following research questions:

1. What are the teachers' perceptions of IWBs in the English as a foreign language classroom?
2. What are the students' perceptions of IWBs in the English as a foreign language classroom?
3. Do students' perceptions of IWBs display differences according to their gender, level of language proficiency and hours of weekly IWB use?
4. Do teachers' perceptions of IWBs display differences according to their gender, years of teaching experience and hours of weekly IWB use?

In this study, it is expected that investigating teachers' and learners' perceptions of the IWB use in the EFL classroom will provide beneficial data for and shed more light on the effective use of this technology, which is now a fact of academic or school life in Turkey. By providing insights into the use of IWBs, the findings of this study should lead governments, school administrators, teachers and in-service trainers to make an assessment of the uses of this IWB technology installed in classrooms. It is also expected that the findings of this study will

provide teacher trainers in tertiary education with useful information regarding the training of pre-service language teachers before they embark on language teaching in schools.

METHODOLOGY

Research design

The present study was primarily carried out with a quantitative approach using a survey methodology. Two separate self-report questionnaires were administered to collect quantitative data about participating teachers' and students' perceptions of IWBs in the EFL classroom. However, the study also included qualitative data drawn from the EFL teachers who were interviewed to express their suggestions and comments by responding to open-ended questions. It can be stated that the study was carried out with a mixed-method design in which both quantitative and qualitative data were collected (Dörnyei, 2007; Mackey and Gass, 2005). Yet, the bulk of data in the study was quantitatively gathered.

Setting and participants

This study was conducted in a large private Anatolian high school in Ankara where IWBs are installed and operated by teachers in classrooms. Like most other private schools, it attached great importance to the study of foreign languages and included 13 hours of English lessons per week in its ninth-grade language curriculum. Since there was not preparatory English program in the high school, English lessons were conducted more intensively in the ninth-grade compared to other grades. Furthermore, English lessons were taught by non-native and native teachers of English (70.70% females and 29.30% males). Teachers used both traditional whiteboards and interactive whiteboards in their English lessons. In the use of IWBs, they mostly used software applications that came along with course books by some international publishers. Unlike most English teachers in public schools where IWBS are also installed, they did not have any resource limitations in terms of interactive whiteboard programs. Since there were only 35 teachers of English in the school based in Ankara, other teachers of English based in another branch of the private school were also asked to participate in the survey. Thus, the survey was sent to a total of 65 teachers working in two branches of a large private Anatolian high school. Since participation was voluntary, a total of 58 teachers opted to answer the survey, yielding an 89% response rate. On the other hand, the student participants of the study consisted of 164 fifteen-year-old ninth grade EFL students enrolled in the Ankara branch of a private Anatolian high school. 52.4% of them (*N*=86) were females and 47.6% of them (*N*=78) were males. The students were placed in their groups based on the results of an online placement test administered at the beginning of the academic year, and their proficiency levels ranged between A2 and C1 according to the CEFR level. After the school administrators' and coordinators' approval, the student survey was sent to 224 ninth-grade students. Since student participation was also voluntary, a total of 164 students agreed to answer the survey, yielding a 73% response rate. Table 1 presents more background information about the participating students and teachers.

Table 1: Background information about the participants

Students	Age	Frequency	Percentage	Level of English Proficiency*	Frequency	Percentage
	15	164	100	A2	68	41.5
				B1	44	26.8
				B2	37	22.6
				C1	15	9.1
	Total	164	100		164	100
Teachers	Age			Years of Teaching Experience		
	20-25	17	29.3	1-5	28	48.3
	26-30	12	20.7	6-10	15	25.9
	31-35	14	24.1	11-15	9	15.5
	36+	15	25.9	16+	6	10.3
	Total	58	100	Total	58	100

* Students took Oxford Placement Test (OPL) at the beginning of the term; they self-reported their CEFR levels based on the OPL results.

Instrument

The instruments for this study included two paper-based questionnaires about the students' and teachers' perceptions of the use of IWBs in the English as a foreign language classroom. Both questionnaires consisted of two parts. The first part of the student questionnaire included five questions that characterize them such as age,

gender, level of English proficiency, weekly hours of IWB use, and skills areas IWBs are used for. Similarly, the first part of the teacher questionnaire included five questions that characterize them such as age, gender, years of teaching experience, weekly hours of IWB use, and skills areas for which they use IWBs. The second part of the student questionnaire included 26 five-point Likert-scale items to measure the student's perceptions about four factors: ***Perceived Learning Contribution, Motivation, Perceived Efficiency,*** and ***Perceived Negative Effects***. Likewise, the second part of the teacher questionnaire consisted of 25 five-point Likert-scale items to measure the teachers' perceptions about four factors: ***Instructional Effects of IWBs, General Attitudes, Motivational Effects of IWBs,*** and ***Need for Training***. While preparing the instruments, the researcher reviewed similar studies that investigated the opinions, attitudes and perceptions of students and teachers in various domains (Moss, et al. 2007; Celik, 2012; Elaziz, 2008; Isman, Abanmy, Hussein and All-Saadany, 2012; Mathews-Aydinli & Elaziz, 2010; Türel, 2011; Türel & Johnson, 2012; Levy, 2002) and adapted a total of 30 items for each questionnaire. For example, some of the items were taken from Türel (2011) who designed a valid and reliable IWB student survey according to Davis' (1989) Technology Acceptance Model in order to assess the IWB use based on perceptions of students who have been taught with IWBs in real classroom settings.

After an experienced colleague's and two experts' opinions were taken for instrument validity, the student questionnaire was reduced to a 26-item scale and the teacher questionnaire to a 25-item one. The student's questionnaire was translated into Turkish and revised by a colleague so that the participating students would have no difficulty understanding the statements. To further improve the questionnaires, a pilot study was conducted with twenty-five tenth grade students in the aforementioned school context and fifteen senior pre-service English teachers in Hacettepe University English Language Teaching Department. This was followed by only slight revisions and rewording of some items in the teacher's questionnaire only. Since the statements in the questionnaire were designed to be rated using a five-point Likert scale, the student and teacher participants rated the items by choosing the responses among (1) strongly disagree, (2) disagree, (3) neutral, (4) agree, and (5) strongly agree. The student's questionnaire contained nine "negatively-keyed" statements such as those of the "perceived negative effects" measures that were reverse coded to ensure consistency. Likewise, the teacher's questionnaire contained eight "negatively-keyed" statements such as those of the "instructional effects" and "need for training" measures that were also reverse coded to ensure consistency (Field, 2009). Consequently, the Cronbach's alpha reliability of the 26-item student questionnaire (after reverse-scoring the appropriate items) was 0.86 while the Cronbach's alpha reliability of the 25-item teacher questionnaire (after reverse-scoring the appropriate items) was 0.88. These high alpha values indicated good internal consistency of the items in the research instruments.

Data collection and analysis

This study was conducted in the 2012-2013 academic year spring semester in a large private Anatolian high school based in Ankara. After the school administrators' and coordinators' approval, a total of 164 student participants enrolled in ninth grade and taking 13 hours of English lessons in their intensive English curriculum volunteered to participate in the study. The sample was not ethnically diverse. All the student participants were Turkish. The survey was anonymous, and without any consultation among themselves the students completed it in fifteen minutes during one of their English classes. The data from the teacher participants were collected from 58 teachers of English who were employed in two branches of a private school, but the bulk of data came from the teachers based in Ankara branch of the school. The teacher survey was also anonymous, and native and non-native teachers opted to complete and return the questionnaire. Although the study used the questionnaires as primary data collection tools, interviews were also conducted with teachers who were actively used IWBs in their English lessons. Thus, the data gathered from interviews were also utilized to support the analyses of the quantitative data.

Data analysis was conducted to address the research questions of the present study. Data gathered from the questionnaires was fed into the computer and analyses were carried out using SPSS (Statistical Package for the Social Sciences) 21, a comprehensive computer program used to help researchers perform statistical analysis quickly and accurately. In order to obtain a model for presenting the results of the participants' perceptions of IWB use, the perfect scores of teachers and students were exclusively summed. Descriptive analyses such as frequency and mean were obtained to characterize the collected data. Other statistical analysis tests conducted for the study consisted of an independent-samples t-test, the one-way analysis of variance (one-way ANOVA) and a post-hoc test. The independent-samples t-test is employed when the two groups or sets of scores whose means are being compared are independent of each other (Mackey and Gass, 2005; Ravid, 2011; Field, 2009). As an extension of a *t*-test for independent samples, one-way ANOVA is used when there are two or more independent groups (Ravid, 2011; Field, 2009). The post-hoc test, which follows an analysis of variance, is used to determine which groups are significantly different from each other. In other words, it tests all of the possible

pairings of groups for statistical differences (Mackey and Gass, 2005; Ravid, 2011; Field, 2009; Larson-Hall, 2010).

The independent-samples t-tests were conducted to compare female and male students' and teachers' perceptions of IWBs while one-way ANOVA was used to find out whether there was any statistically significant difference of perceptions among student participants according to their language proficiency level. One-Way ANOVA was used to measure the proficiency level and hours of weekly IWB use instead of t-test because there were four options of proficiency levels being compared. This analysis of variance was further followed by a post-hoc comparison in which Tuckey's post-hoc test was conducted to find out exactly where the significant differences between groups existed. One-way ANOVA was also used to find out whether there was any statistically significant difference of perceptions among EFL teachers according to their years of teaching experience, age and hours of weekly IWB use. All statistical tests conducted for this study were assessed at the 0.05 level of significance.

RESULTS

This section presents the results of the current study in terms of descriptive and inferential statistics as well as a discussion and analysis of the findings. A short presentation of the participants' opinions is also given at the end of the section. It also compares the findings with the research studies conducted previously.

An exclusive summation of the perfect scores of participating teachers and students was first made in order to obtain a model for presenting the results of teachers' and students' perceptions of IWBs in the EFL classroom. Then, their perfect scores were divided into three categories to get the appropriate cut-off points for each of them. Table 2 presents the perfect scores for students' overall perceptions of IWBs based on the four constituent factors, the obtained main scores and mean scores along with percentages for high, moderate and low perceptions for each dimension and the overall perception of IWB use. The perceptions of IWB use were considered as 'low' if they were within the low score category of each variable's total range, 'moderate' if they were within the middle score category of the total range, and 'high' if they were within the high score category of the total range.

Table 2: Main scores, mean scores and the self-developed cut-off points for the model

Groups	Variables	Perfect Scores	Cut-off points for Main Scores			Cut-off points for Mean Scores		
			Low	Moderate	High	Low	Moderate	High
Teachers	Instructional effects of IWBs	1-55	1-18 0.0%	19-36 12.1%	37-55 87.9%	1-2.30 0.0%	2.31-3.50 0.0%	3.51-4.66 100.0%
	General attitude	1-40	1-13 1.7%	14-26 13.8%	27-40 84.5%	1-2.30 0.0%	2.31-3.50 0.0%	3.51-4.66 100.0%
	Motivational effects	1-20	1-6 0.0%	7-13 27.6%	14-20 72.4%	1-2.30 0.0%	2.31-3.50 0.0%	3.51-4.66 100.0%
	Need for training	1-10	1-3 0.0%	4-7 91.4%	8-10 8.6%	1-2.30 0.0%	2.31-3.50 50.%	3.51-4.66 0.0%
	Overall perception	1-125	1-42 0.0%	43-84 13.8%	85-125 86.2%	1-2.30 0.0%	2.31-3.50 0.0%	3.51-4.66 100.0%
Students	PLC*	1-25	1-8 0.0%	9-17 13.4%	18-25 86.6%	1-2.25 0.0%	2.26-3.50 0.0%	3.51-4.67 100.0%
	Motivation	1-55	1-18 .6%	19-36 17.7%	37-55 81.7%	1-2.25 0.0%	2.26-3.50 0.0%	3.51-4.67 90.90%
	PE*	1-25	1-8 1.2%	9-17 34.8	18-25 64.0	1-2.25 0.0%	2.26-3.50 0.0%	3.51-4.67 80%
	PNE*	1-25	1-8 2.4	9-17 66.5	18-25 31.1%	1-2.25 0.0%	2.26-3.50 40%	3.51-4.67 0.0%
	Overall perception	1-130	1-45 0.0%	46-89 25.6	90-130 74.4%	1-2.25 0.0%	2.26-3.50 0.0%	3.51-4.67 100.0%

** PLC, perceived learning contribution; PE, perceived efficiency; PNE, perceived negative effect*

The item-based analyses of the four factors in both groups were conducted to statistically depict a comprehensive picture of the participants' perceptions on the perceived effects of IWBs on successful language learning. That is, the general mean scores for each of the four dimensions used to measure the teachers' and

student's perceptions on the effectiveness of IWB use in language learning were obtained by summing the participants' ratings for the corresponding items within four dimensions. Drawing upon the information given on the characteristics of factors reflecting teachers' and students' perceptions of IWBs, the results of the descriptive analyses of the participants' self-report on the use of IWBs are presented below based on the order of research questions.

Descriptive statistics

Teachers' perceptions of IWBs in the EFL classroom

Most of the participants were females (70.7%). The results of descriptive analyses for teachers revealed an excellent consistency in the mean scores of the items within all four subscales except for items 6 (*M*=3.67, *SD*=.68) and 25 (*M*=1.91, *SD*=0.77). As the mean scores for all items fall within the highest category of the self-developed cut-off points for IWB use, except for item 25 and that 96% of the participants positively rated the statements, it can be concluded that there was a general consensus among EFL teachers on the benefits of IWB use in language teaching. Moreover, item 3(*Using IWBs makes it easier to reach different sources and display them to the whole class immediately*) received the highest mean score (*M*=4.66, *SD*=.47) while the lowest mean score (*M*=1.91, *SD*=.77) was obtained for item 25(*If I do not get sufficient training, I do not feel comfortable with using IWBs in the classroom*), a reverse coded item, which marks the high proportion (81%) of consensus and agreement on the statement.(Table 3).

Table 3: Descriptive statistics for teachers' perceptions of the IWB use in the EFL classroom

Items and Item Descriptions		1	2	3	4	5	Mean	SD
I.	*Instructional effects of IWBs*							
1.	Using the IWB resources reduces the time I spend writing on the board.	0	0	2	29	27	4.43	.56
2.	When using IWBs in the classroom, I spend more time for the preparation of the lesson.*****	0	0	14	28	16	4.03	.72
3.	Using IWBs makes it easier to reach different sources and display them to the whole class immediately.	0	0	0	20	38	4.66	.47
4.	IWBs are beneficial for saving and printing the materials generate during the lesson.	0	1	12	26	19	4.09	.77
5.	I can give explanations more effectively with the use of IWBs.	0	0	9	34	15	4.10	.64
6.	With the help of using the IWB, I can easily control the whole class.	0	0	26	25	7	3.67	.68
7.	I think IWBs can be a good supplement to support English teaching.	0	0	1	27	30	4.50	.53
8.	Using IWBs makes me a more efficient teacher.	0	0	8	31	19	4.19	.66
9.	Using IWBs makes it easier for an English teacher to review, re-explain, and summarize the subject.	0	0	3	34	21	4.31	.56
10.	I believe IWB is a useful technology for English teachers to learn.	0	0	2	34	22	4.34	.54
11.	Using IWB makes the English lessons more interactive.	0	0	2	36	20	4.31	.53
II.	*General attitudes*							
12.	I like using IWB technology in my English lessons.	0	0	3	27	28	4.43	.59
13.	I feel uncomfortable using IWBs in front of my students.*****	0	1	6	28	23	4.25	.71
14.	I have positive attitudes toward the use of IWBs in language teaching.	0	0	1	25	32	4.53	.53
15.	I have negative attitudes toward the use of IWBs in language teaching.*	0	0	4	25	29	4.43	.62
16.	I do not think my students are ready for this technology.*****	0	0	3	14	41	4.65	.57
17.	What I do in class with traditional methods is sufficient for teaching English.*	0	0	6	25	27	4.36	.66
18.	I am not the type to do well with IWB-based applications.*****	0	0	2	31	25	4.39	.56
19.	There is no difference between my use of a traditional board and an IWB in terms of teaching techniques and methods.*****	0	1	5	28	24	4.29	.70
III.	*Motivational effects of IWBs*							
20.	I think IWBs make learning more enjoyable and more interesting.	0	0	3	30	25	4.38	.58
21.	I can keep my students' attention longer with the help of IWB technology.	0	1	10	27	20	4.14	.76
22.	I think IWBs increase the interaction and participation of the	0	1	2	31	24	4.34	.63

	students.							
23.	I think my students are more motivated when I use an IWB in my lessons.	0	0	9	29	20	4.19	.68
IV.	*Need for training*							
24.	I believe that training is required to teach with IWB technology.	0	0	2	27	29	4.47	.56
25.	If I do not get sufficient training, I do not feel comfortable with using IWBs in the classroom.*	18	29	9	2	0	1.91	.77

* Asterisks indicate negatively-worded items in the scale.

The instructional effects of IWBs, general attitude, and motivational effects dimensions received positive ratings (100%) whereas the need for training item received a negative or neutral rating (50%). Additionally, the percentages analyses showed that 87.5% of the participants agreed with instructional effect dimension, 93.12% with general attitude, 89% with motivational effects dimension, and 50% with need for training dimension. The reason why the need for training dimension reveals low percentage is the fact that item 25 is a negatively-keyed statement and its low percentage, indeed, represents positive attitude regarding the necessity of training. Totally, 80% of teachers agreed with the overall perceptions of IWBs in EFL classrooms. Figure 1 diagrammatically illustrates total mean scores of teachers' perceptions of IWB use regarding overall perception and the four designated dimensions.

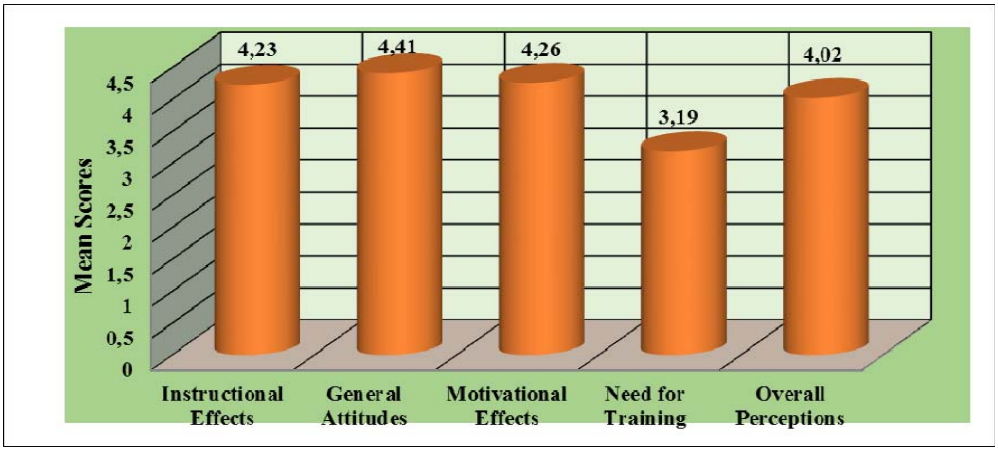

Figure 1: Teachers' perceptions of IWB use in the EFL classroom

The results of descriptive analysis for Teachers' Hours of Weekly IWB use revealed that the highest mean scores were ascribed to female participants (*M*=2.66, *SD*=1.15) .This suggests that females have higher perceptions of using IWBs than males. Moreover, the results indicated that the highest percentages of females (31.7%) fall within '11 hours and more' group and 35.3% of males in '1-2 hours' group, suggesting that female teachers spend more hours on using IWBs than males. (Table 4).

Table 4. Descriptive statistics for teachers' hours of weekly IWB use

Gender	Hours of weekly IWB use	N	F	%	Mean	SD
	1-2 hours		9	22.0		
Female	3-5	41	9	22.0	2.66	1.15
	6-10		10	24.4		
	11 hours and more		13	31.7		
	1-2 hours		6	35.3		
Male	3-5	17	2	11.8	2.41	1.22
	6-10		5	29.4		
	11 hours and more		4	23.5		
	1-2 hours		15	25.9		
Total	3-5	58	11	19.0	2.59	1.17
	6-10		15	25.9		
	11 hours and more		17	29.3		

Students' perceptions of IWBs in the EFL classroom

The results of descriptive analyses indicated that 52.4% of the participants were females (N=86) and that the mean scores obtained for the items were not consistent within the scale (Table 5). However, based on the self-developed cut-off points mentioned above, 80.77% of the mean scores received for all items were found to be fallen within the highest category of the self-developed cut-off points for IWB use. As in the case of teachers, most of the students demonstrated greater enthusiasm and interest for using IWB technology in learning English. The highest mean score was received for item 10 (*It seems difficult for me to use IWBs*), a reverse-coded item, indicating that a great majority of students disagreed with the statement. The lowest mean score, on the other hand, was ascribed to item 7(*Sometimes deficiencies of the IWB screen and sunlight in the classroom make it difficult to see the things on the IWB*), which is also a reverse-coded item, suggesting that most of the students agreed with the statement.

Table 5: Descriptive statistics for students' perceptions of the IWB use in the EFL classroom

Items and Item Descriptions		1	2	3	4	5	Mean	SD
I.	*Perceived learning contribution*							
1.	I learn more when my teacher uses the whiteboard.	2	5	28	85	44	4.00	.82
2.	It is easier to understand the lesson when my teacher uses an IWB.	0	4	20	92	48	4.12	.70
3.	Using audio and visual materials with IWBs helps me understand the lesson better.	1	3	10	91	59	4.24	.70
4.	I find the opportunity to learn from different sources with the use of IWBs.	4	7	19	88	46	4.01	.89
5.	IWB use makes it easier for me to remember what I learned in class	3	14	38	79	30	3.73	.92
II.	*Motivation*							
9.	I like going to the front of the class to use the IWB.	3	15	32	70	44	3.84	.98
10.	It seems difficult for me to use IWBs.*	1	3	4	33	123	4.67	.67
11.	I prefer lessons that are taught with an IWB.	1	10	26	87	40	3.95	.83
12.	It makes me uncomfortable when my work is shown to the whole class on the IWB.*	19	19	38	51	37	3.41	1.27
13.	I concentrate better when my teacher uses an IWB.	5	12	39	74	34	3.73	.97
14.	I get to join in lessons more when my teacher uses an IWB.	2	13	42	71	36	3.77	.92
15.	IWBs make learning English more interesting and exciting.	10	5	28	80	41	3.84	1.03
16.	It is easier to keep my attention when an IWB is used during the lesson.	3	16	41	74	30	3.68	.94
17.	Use of an IWB makes it easier for me to be motivated during the lesson.	7	17	33	78	29	3.64	1.02
18.	IWB use increases my interest in the English lesson.	9	14	29	81	31	3.68	1.05
19.	If my English teachers use IWB more often, I will enjoy lessons more.	6	18	31	75	34	3.69	1.03
III.	*Perceived efficiency – PE*							
6.	IWBs make the teachers' drawings and diagrams easier to see.	8	10	38	65	43	3.76	1.06
21.	The lessons become more organized when an IWB is used.	5	11	37	80	31	3.74	0.94
22.	Using an IWB saves time and the lesson moves smoothly.	7	11	31	76	39	3.79	1.02
25.	There is no difference between my English teacher's use of a traditional board and an IWB in terms of teaching techniques and methods.*	24	29	28	55	28	3.20	1.32
26.	I think there is not much difference between an IWB and a normal whiteboard.*	9	18	16	67	54	3.84	1.15
IV.	*Perceived negative effects – PNE*							
7.	Sometimes deficiencies of the IWB screen and sunlight in the classroom make it difficult to see the things on the IWB.*	82	36	15	19	12	2.04	1.31
8.	IWBs often break down and recalibration causes a waste of time.*	41	31	28	44	20	2.82	1.38
20.	When my teacher uses an IWB, I cannot keep up with the lesson because the pace of the lesson.*	20	27	19	63	35	3.40	1.31
23.	During IWB use, there is a lot of noise in class.*	15	20	20	78	31	3.54	1.19
24.	IWB was exciting at the beginning but not anymore.*	12	17	27	46	62	3.78	1.25

* Asterisks indicate negatively-keyed items in the scale.

Given the self-developed cut-off points, the perceived learning contribution, motivation, and perceived efficiency dimensions and overall perceptions of IWBs received positive ratings (100%, 90.90%, 80 %, and 80.77 respectively), whereas the perceived negative effects dimension was rated negatively or moderately (40%), emphasizing the positive aspects of IWB technology as valuable instructional tool in learning English as a foreign language. Furthermore, the results of percentages analyses indicated that 80.75% of the students agreed with perceived learning contribution, 69.45% with motivation dimension, 66% percent with perceived efficiency dimension, and 50% with perceived negative effects dimension. All in all, 67% of students agreed with overall perceptions of IWB technology. Figure 2 shows the total mean scores for the four dimensional model of factors affecting students' perceptions of IWB use.

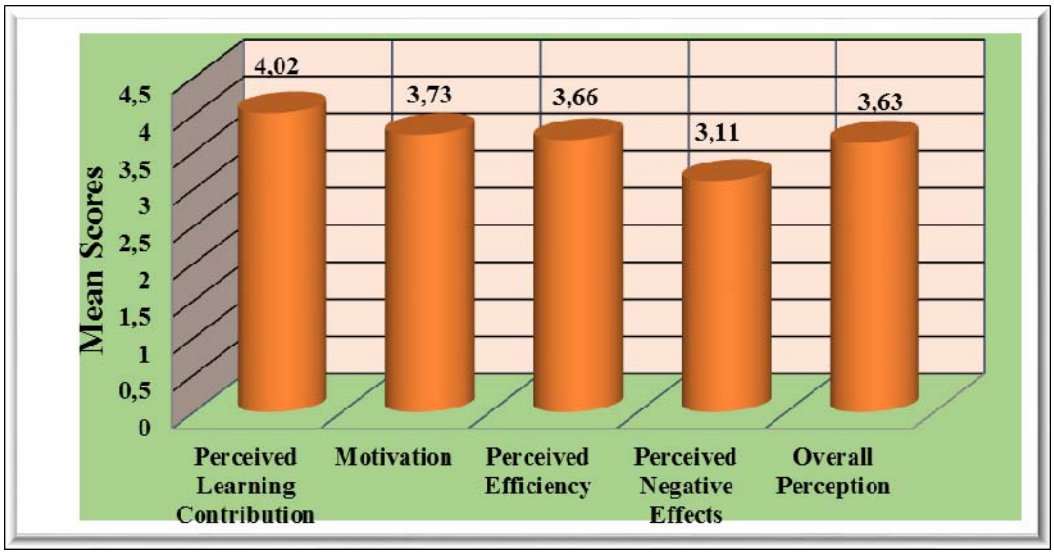

Figure 2: Students' perceptions of IWB Use in the EFL classroom

Unlike teachers' group, the results of descriptive analysis for students' Hours of Weekly IWB Use reported the highest mean score for female participants (*M*=2.66, *SD*=1.15), suggesting that male students are more interested in using IWBs than females. Surprisingly, the results indicated that 44.2 % of females and 52.6% of males belong to the same group, i.e., '6-10 hours' group (Table 6).

Table 6: Descriptive results for students' hours of weekly IWB use

Gender	Hours of weekly IWB use	N	F	%	Mean	SD
	1-2 hours		2	2.3		
Female	3-5	86	18	20.9	3.07	.79
	6-10		38	**44.2**		
	11 hours and more		28	32.6		
	1-2 hours		1	1.3		
Male	3-5	78	9	11.5	3.21	.69
	6-10		41	**52.6**		
	11 hours and more		27	34.6		
	1-2 hours		3	1.8		
Total	3-5	164	27	16.5	3.13	.75
	6-10		79	**48.2**		
	11 hours and more		55	33.5		

As for the English proficiency level of students, the results showed that a substantial number of students (41.5%) belong to the beginner's level (A2) while only 9.1% fall within C1 group (Table 7).

Table 7: Percentages of students according to their level of English proficiency

	English Proficiency Level	F	%
Students	A2	68	41.5
	B1	44	26.8
	B2	37	22.6
	C1	15	9.1

Inferential Statistics

Differences of students' perceptions of IWBs

This part presents the results of data analysis regarding whether there are any statistically significant differences of students' perceptions of IWBs according to their gender, level of language proficiency, and hours of weekly IWB use.

The results of descriptive analysis showed differences in the mean scores of males and females across the perception dimensions measured in the study. As shown in Table 8, females had higher mean scores for ***perceived learning contribution*** and ***perceived negative effects*** dimensions while males had higher ratings for the ***perceived efficiency*** and ***motivation*** dimensions. Additionally, compared with females, males exhibited a higher rating for overall perception of IWB use. However, the independent-samples t-test revealed that there was statistically no significant difference between female (*N*=86) and male (*N*=78) students because the *p*-value for all variables was greater than the level of significance set at 0.05.

Table 8: Students' perceptions of IWB use by gender

	Group Statistics				t-test		
Variables	Gender	N	Mean	SD	t	df	Sig.(two-tailed)
Perceived learning contribution	Female	86	20.16	3.01	.286	162	.776
	Male	78	20.03	3.13			
Motivation	Female	86	41.33	6.55	-1.163	162	.246
	Male	78	42.51	6.49			
Perceived efficiency	Female	86	18.29	3.25	-.201	162	.841
	Male	78	18.40	3.55			
Perceived negative effects	Female	86	15.76	3.76	.539	162	.591
	Male	78	15.44	3.83			
Overall perception	Female	86	95.53	12.93	-.419	162	.676
	Male	78	96.37	12.58			

*Significant at 0.05 level
** Significant at 0.01 level

The results of One-way ANOVA test demonstrated that there were statistically significant differences between participants according to their language proficiency level in the two dimensions of *motivation*, F (3,160) = 2.818, p=0.041,p<0.05, and *perceived efficiency*, F (3,160= 3.499, p=0.017, p< 0.05. However, as shown in Table 9, no significant difference was found among participants with respect to their proficiency level in the *perceived learning contribution* dimension, F (3,160= .362, p=0.780, p> 0.05, *perceived negative effects* dimension, F (3,160= 1.210, p=0.308, p>0.05, and overall perception of IWB use, F (3,160= 2.233, p=0.086, p> 0.05. Furthermore, the results of 'Effect Size' statistics (Cohen, 1988; Larson-Hall, 2010; Field, 2009) based on the 'Eta Square' value (η^2) revealed a slight significant difference for *motivation* dimension ($\eta^2 = 0.050$, $\eta^2 < 0.59$) and a moderate significant difference ($\eta^2 = 0.061$, $\eta^2 > 0.59$) between groups.

Table 9: Students' perceptions of IWB use according to their level of language proficiency

		Group Statistics			ANOVA			
Variables	Proficiency level	N	Mean	SD	df	F	Sig.	η^2
Perceived learning contribution	A2	68	20.29	2.81	3;160	.362	0.780	-
	B1	44	20.14	3.33				
	B2	37	19.65	3.06				
	C1	15	20.20	3.48				
Motivation	A2	68	42.47	5.97	3;160	2.818	**0.041***	0.050
	B1	44	43.00	6.51				
	B2	37	39.22	6.58				
	C1	15	42.60	7.67				

	A2	68	17.69	3.33				
	B1	44	19.70	2.79				
Perceived efficiency	B2	37	18.05	3.30	3;160	3.499	**0.017***	0.061
	C1	15	18.00	4.48				
	A2	68	15.22	3.70				
	B1	44	16.50	3.44				
Perceived negative	B2	37	15.19	3.97	3;160	1.210	0.308	-
effects	C1	15	15.73	4.59				
	A2	68	95.68	11.38				
	B1	44	99.34	12.18				
Overall perception	B2	37	92.11	13.72	3;160	2.233	0.086	
	C1	15	96.53	15.84				

*Significant at 0.05 level
** Significant at 0.01 level

Furthermore, as the assumption of homogeneity of variances was met in all four designated dimensions, Tuckey's post-hoc test was conducted to find out exactly where the significant differences between groups exist. The post hoc comparisons using the Tuckey's HSD test revealed that participants with B1 and B2 language proficiency level differed significantly in motivation dimension, and those with A2 and B1 proficiency level differed significantly in their perceptions of perceived efficiency dimension from other groups tested. (Table 10).

Table 10: Post hoc test for language proficiency level and IWB use

Tuckey's HSD	Multiple Comparisons				
Variables	(I) English Level	(J) English Level	Mean Difference (I-J)	Std. Error	Sig.
	A2	B1	-.52	1.24	.974
		B2	3.25	1.31	.067
Motivation		C1	-.12	1.83	1.000
	B1	A2	.52	1.24	.974
		B2	3.78*	1.43	**.045***
		C1	.40	1.92	.997
	B2	A2	-3.25	1.31	.067
		B1	-3.78*	1.43	**.045***
		C1	-3.38	1.96	.317
	C1	A2	.12	1.83	1.000
		B1	-.40	1.92	.997
		B2	3.38	1.96	.317
	A2	B1	-2.01*	.64	**.011***
		B2	-.36	.67	.950
		C1	-.30	.94	.988
Perceived	B1	A2	2.01*	.64	**.011***
efficiency		B2	1.65	.73	.119
		C1	1.70	.99	.317
	B2	A2	.36	.67	.950
		B1	-1.65	.73	.119
		C1	.05	1.01	1.000
	C1	A2	.30	.94	.988
		B1	-1.70	.99	.317
		B2	-.05	1.01	1.000

*. The mean difference is significant at the 0.05 level.

Similarly, the results of One-way ANOVA test indicated that there were statistically significant differences between participants according to their hours of weekly IWB use in the two dimensions of *motivation*, F (3,160) = 4.253, p=0.006,p<0.05, and *perceived efficiency*, F (3,160)= 4.177, p=0.007, p< 0.05, and *overall perception* ,F (3,160)= 4.411, p=0.005, p< 0.05. However, as shown in Table 11, no significant difference was found among participants in relation to their hours of weekly IWB use in the *perceived learning contribution* dimension, F (3,160= 1.923, p=0.128, p>0.05, and *perceived negative effects* dimension, F (3,160= .871, p=0.458, p>0.05.

Furthermore, the results of 'Effect Size' statistics (Cohen, 1988; Larson-Hall, 2010; Field, 2009) based on the 'Eta Square' value (η^2) revealed a moderate significant differences for *motivation* dimension ($\eta^2 = 0.070$, $\eta^2 > 0.59$), *perceived efficiency* ($\eta^2 = 0.072$, $\eta^2 > 0.59$) and *overall perception* ($\eta^2 = 0.070$, $\eta^2 > 0.59$).

Table 11: Students' perceptions of IWB use according to their hours of weekly use

Variables	Hours of Weekly IWB use	N	$\bar{X}$	SD	df	F	Sig.	η^2
Perceived learning contribution	1-2 hours	3	22.33	1.528	3;160	1.923	.128	-
	3-5	27	21.07	2.601				
	6-10	79	20.00	2.944				
	11 hours and more	55	19.64	3.385				
Motivation	1-2 hours	3	3	47.67	3;160	4.253	**.006***	0.070
	3-5	27	27	45.19				
	6-10	79	79	41.53				
	11 hours and more	55	55	40.47				
Perceived efficiency	1-2 hours	3	3	17.67	3;160	4.177	**.007***	0.072
	3-5	27	27	20.30				
	6-10	79	79	18.22				
	11 hours and more	55	55	17.60				
Perceived negative effects	1-2 hours	3	3	16.33	3;160	.871	.458	-
	3-5	27	27	16.11				
	6-10	79	79	15.86				
	11 hours and more	55	55	14.95				
Overall perception	1-2 hours	3	3	104.00	3;160	4.411	**.005***	.076
	3-5	27	27	102.67				
	6-10	79	79	95.61				
	11 hours and more	55	55	92.65				

Furthermore, as in the case of students' proficiency level, the post hoc comparisons using the Tuckey's HSD test revealed that the main differences existed largely between '3-5 hours' group and '11 hours and more' in all significant dimensions and overall perception while groups '3-5' and '6-10' differed significantly from each other in perceived efficiency dimension (Table 12).

Table 12: Post hoc test for hours of weekly IWB use and IWB use perceptions

Tuckey's HSD	Multiple Comparisons				
Variables	(I) Hours of Weekly IWB Use	(J) Hours of Weekly IWB Use	Mean Difference (I-J)	Std. Error	Sig.
Motivation	1-2 hours	3-5	2.48	3.86	.918
		6-10	6.13	3.73	.357
		11 hours and more	7.19	3.76	.227
	3-5	1-2 hours	-2.48	3.86	.918
		6-10	3.65	1.41	.052
		11 hours and more	**4.71***	1.49	**.010***
	6-10	1-2 hours	-6.13	3.73	.357
		3-5	-3.65	1.41	.052
		11 hours and more	1.05	1.11	.778
	11 hours and more	1-2 hours	-6.13	3.73	.357
		3-5	-3.65	1.41	.052
		6-10	1.05	1.11	.778
Perceived efficiency	1-2 hours	3-5	-2.63	2.00	.557
		6-10	-.54	1.93	.992
		11 hours and more	.06	1.95	1.000
	3-5	1-2 hours	2.63	2.00	.557
		6-10	**2.08***	.73	**.026***

		11 hours and more	**2.69***	.77	**.004***
	6-10	1-2 hours	.54	1.93	.992
		3-5	**-2.08***	.73	**.026***
		11 hours and more	.61	.57	.712
	11 hours and more	1-2 hours	-.06	1.95	1.000
		3-5	**-2.69***	.77	**.004***
		6-10	-.61	.57	.712
	1-2 hours	3-5	1.33	7.51	.998
		6-10	8.39	7.26	.656
		11 hours and more	11.34	7.32	.411
	3-5	1-2 hours	-1.33	7.51	.998
		6-10	7.05	2.75	.054
Overall		11 hours and more	**10.01***	2.90	**.004***
perception	6-10	1-2 hours	-8.39	7.26	.656
		3-5	-7.05	2.75	.054
		11 hours and more	2.95	2.16	.525
	11 hours and more	1-2 hours	-11.34	7.32	.411
		3-5	**-10.01***	2.90	**.004***
		6-10	-2.95	2.16	.525

*. The mean difference is significant at the 0.05 level.

Differences of teachers' perceptions of IWBs

This part presents the results of data analysis regarding whether there are any statistically significant differences of teachers' perceptions of IWBs according to their gender, years of teaching experience, and hours of weekly IWB use.

The results of the independent-samples t-test revealed that there were not any statistically significant differences between female (*N*=41) and male (*N*=17) teachers because the *p*-value for all variables was greater than the level of significance set at 0.05. However, the examination of group statistics suggested differences between males and females (Table 13) across the four dimensions measured. Female teachers had higher ratings for the two dimensions of *instructional effects* and *motivational effects*, whereas males had higher ratings for the dimensions of *general attitude* and *need for training*. Furthermore, female participants had higher mean scores in overall perception of IWB use.

Table 13: Teachers' perceptions of IWB use by gender

	Group Statistics				t-test		
Variables	Gender	N	Mean	SD	t	df	Sig.(two-tailed)
Instructional effects	Female	41	41.82	4.39	.996	56	.323
	Male	17	40.58	4.12			
General attitude	Female	41	30.12	4.15	-.919	56	.362
	Male	17	31.23	4.30			
Motivational effects	Female	41	14.97	1.96	1.358	56	.180
	Male	17	14.11	2.66			
Need for training	Female	41	9.78	2.35	-.301	56	.764
	Male	17	10.00	2.91			
Overall perception	Female	41	96.70	8.98	.291	56	.772
	Male	17	95.94	9.41			

A one-way ANOVA test was conducted to find out whether EFL teachers' teaching experience does have any impact on their perceptions of IWB use. The results showed no significant differences for the participants' perceptions in relation to their years of teaching experience. Even though the participants did not differ significantly in their perceptions, as indicated in Table 14, the mean scores for experience group of '11-15' in two dimensions of *general attitude* and *motivational effects*, for '6-10' group in *instructional effects dimension*, and for '1-5' group in *need for training* dimension were higher than other groups. Moreover, EFL teachers with 11-15 years of teaching experience had a higher mean score for overall perception of IWB technology use in the EFL classroom. This means that teachers with more years of teaching experience reported more favorable perceptions of IWB use than less experienced teachers.

Table 14: Years of teaching experience and IWB use perceptions

Variables	Years of Teaching Experience	N	Mean	SD	df	F	Sig.
	1-5 years	28	41.35	4.61			
	6-10 years	15	42.26	3.19			
Instructional effects	11-15 years	9	41.22	5.01	3;54	.313	.816
	16 years and above	6	40.33	5.00			
	1-5 years	28	29.78	3.76			
	6-10 years	15	31.06	3.99			
General attitude	11-15 years	9	31.88	6.03	3;54	.728	.540
	16 years and above	6	29.83	3.65			
	1-5 years	28	14.53	2.51			
	6-10 years	15	14.66	1.95			
Motivational effects	11-15 years	9	15.44	1.74	3;54	.380	.768
	16 years and above	6	14.66	2.16			
	1-5 years	28	10.10	2.18			
	6-10 years	15	9.73	2.81			
Need for training	11-15 years	9	9.44	3.00	3;54	.217	.884
	16 years and above	6	9.50	2.88			
	1-5 years	28	95.78	8.62			
	6-10 years	15	97.73	8.57			
Overall perception	11-15 years	9	98.00	10.09	3;54	.337	.799
	16 years and above	6	94.33	12.01			

*Significant at 0.05 level
** Significant at 0.01 level

By the same token, a one-way ANOVA test was conducted to find out whether or not EFL teachers' perceptions of IWB use differ with respect to their hours of weekly IWB use. The results showed no significant difference in the participants' perceptions in relation to their hours of weekly IWB use. As indicated in Table 15, however, the results of group statistics reported high mean scores for '3-5 hours' group in two dimensions of *instructional effects of IWB use* (*M*=42.81, *SD*=4.44), *general attitude* (*M*=5.00, SD= 1.50), and *motivational effects* (*M*=15.36, *SD*=1.50), and for '11 hours and more' group in *need for training* dimension (*M*=6.64, *SD*=.93). Additionally, the highest mean score was observed for '11 hours and more' group in *overall perceptions of IWB use* (*M*=94.64, *SD*=10.16).

Table 15: Hours of weekly IWB use and IWB perceptions

Variables	Hours of Weekly IWB Use	N	Mean	SD	df	F	Sig.
	1-2 hours	15	40.33	3.24			
Instructional effects	3-5 hours	11	**42.81**	4.44			
	6-10 hours	15	40.60	3.77	3;54	1.153	.336
	11 hours and more	17	42.35	5.32			
General attitude	1-2 hours	15	4.49	1.16			
	3-5 hours	11	**5.00**	1.50			
	6-10 hours	15	3.18	.82	3;54	.426	.735
	11 hours and more	17	4.35	1.05			
Motivational effects	1-2 hours	15	14.40	2.87			
	3-5 hours	11	**15.36**	1.50			
	6-10 hours	15	14.80	1.78	3;54	.452	.297
	11 hours and more	17	14.52	2.34			
Need for training	1-2 hours	15	6.26	.88			
	3-5 hours	11	6.27	.64			
	6-10 hours	15	6.26	.79	3;54	1.260	.297
	11 hours and more	17	**6.64**	.93			

Overall perception	1-2 hours	15	90.93	8.72			
	3-5 hours	11	94.00	9.40			
	6-10 hours	15	92.53	6.04	3;54	.244	.865
	11 hours and more	17	**94.64**	10.16			

Results of qualitative data

The quantitative data reported in the above sections were based on the organized statistics from two five-point Likert questionnaires administered to EFL students and teachers. By means of convenient sampling technique, the researcher also conducted interviews with some participating teachers in Turkish and asked them open-ended questions in order to give them the opportunity to express themselves fully. The following spontaneous comments and suggestions they made might illustrate a variety of opinions held by the EFL teachers about the use of IWBs in English lessons.

- *IWB must be used as teaching tool, not as a means of entertaining students. In order to use it effectively, the teachers need training for technical issues and programs that come with the course books.*
- *Sometimes PCs connected to IWBs break down. This prevents us from using them for several days. This is a problem for teachers. We need technical support all the time.*
- *I graduated from the university last year and began to use the IWB here. I did not get training for IWB use in the department at the university. So I got special training for the IWB at the beginning of the term, but it was not enough.*
- *IWBs and Table PCs should be connected so that students can copy and paste the teacher's words on the board.*
- *IWBs are good at taking students' attention and motivating students. There is more student participation in the class when I use the IWB.*
- *I don't know if the traditional boards will be replaced with IWBs, but to me IWBs will always be available in schools.*
- *I wasn't satisfied with the training I got from the IWB manufacturer or seller because they didn't show us how to use the software that came with the course books. But I can manage the course of my English lessons more easily now. Because we attended workshops by the publishers of the books we use…*
- *IWBs must be used all around the country. But schools should also provide the necessary software that comes with course books.*
- *Schools should have suitable course books for IWBs. I mean the material should be uploadable to the board, so that teachers can use the books easily.*
- *While using videos on IWBs, optional subtitles should also be available.*
- *It is not necessary to use the IWB all the time. But we have to use it especially for listening skills because there is no other choice to make students listen to the dialogs and conversations.*

The above comments and suggestions give a general impression of teachers' comments and suggestions about the use of IWBs in their English classes. Despite some technical problems they reported that they encountered in utilizing the IWB technology, the interview sessions indicated that all teachers support the use of IWB technology in English lessons and emphasize their training need for IWBs, especially with reference to software that comes with the course books by publishers. In sum, these findings are in line with those of Yang and Teng's (2014) study that revealed that using IWBs effective requires L2 teachers to master IWB technical skills as well as a professional knowledge of attaining language teaching goals.

DISCUSSION

The above findings are discussed here to find answers to the research questions which were the objectives of this study. The percentage and mean scores revealed that both teachers and students have positive perceptions of the overall use of IWBs and their effectiveness in EFL classrooms. However, the results of t-test and One-way ANOVA tests for teachers showed no significant difference in participants' perceptions of IWBs with respect to their gender and years of experience. This can be attributed to the fact that 80% of the teachers agreed with overall perceptions of IWBs and that 96 % of their ratings fall within high level perceptions of IWBs which, in turn, puts much weight on the homogeneity of variances in the ratings of the respondents. This implies that teachers predominantly are aware of the instructional and motivational advantages of IWBs. Put another way, they largely perceive that IWBs are time-saving facilities which help them have access to a wide variety of resources instantly during the teaching process, elaborate effectively on the teaching materials, develop self-confidence and enhance their self-efficacy, making them more efficient language teachers while having adequate

control of their classes. Overall, EFL teachers feel more comfortable with the IWB technology and advocate its use while rejecting the idea that neither the teachers nor students are ready to make use of the IWB technology in EFL classroom. Furthermore, it is perceived that using IWBs provides enjoyable atmosphere for language learning, motivates students towards getting the most out of their learning through enhanced interaction.

Teachers' ratings for the two statements in the dimension of need for training indicated that 81% of participants need IWB training, which means that they will not feel comfortable unless they receive sufficient training in using the IWB technology. This goal can be achieved through attending IWB training workshops as part of Continuing Professional Development (CDP). This finding is largely in line with the findings of several studies on IWB (Slay et al., 2008; Türel & Johnson, 2012; Celik, 2012; Glover & Miller, 2001; Smith et al., 2005; Somyürek, Atasoy, and Özdemir, 2009; Mathews-Aydinli & Elaziz, 2010). According to Celik (2012) and Slay et al. (2008), making optimal use of the promising interactive technology tools such as IWBs demands crucial changes in the common practices of teaching and curriculum development. It is speculated that using IWBs will certainly become essential ICT tool in educational settings all over the world as well as Turkey. Therefore, it would be reasonable and wise to argue that teachers should be provided with the opportunity to get familiar with the IWB technology, its pedagogical aspects along with instructional potentials and advantages through in-service training workshops which may serve as a medium for gaining required skills and creating self-confidence in teachers to use this new technology properly. Türel & Johnson (2012, p. 362) also argue that teachers need training on using effective instructional strategies for IWB-assisted courses so that they will be able to transform their pedagogy into more student-centered, social and interactive learning. They further assert that this training has two caveats: "1) one time training sessions provided by the representative of IWB supplier are superficial, and 2) schools do not have the time and budget to provide regular training sessions. As such, teachers should be supported to continuously use IWBs in their classrooms by working with their peers in order to improve their IWB skills and knowledge". This assertion is further supported by Isman, Abanmy, Hussein and All-Saadany (2012) who emphasize that teachers need to get training in improving student learning and their teaching competencies by participating in a professional development program aimed at effective use of IWBs.

As for the students, the findings of t-test revealed that their perceptions of IWBs do not display any difference with respect to their gender. However, the results of One-way ANOVA demonstrated that the participants differ in their perceptions according to their language proficiency level and these differences between students were observed at the beginners' level of A2, and intermediate levels of B1 and B2. This implies that as the students continue using the IWBs, their perceptions of new technology changes over time and one could easily capture the fluctuations inherent in their perceptions until they gain upper hand in dealing with and manipulating IWBs. However, when they reach the C1 and C2 levels, a state of high intellectual development in mastery of language skills, their early excitements over the use of IWBs reduce and become more skilful in using IWBs. This suggests that they feel they are efficient enough to deal with the new technology. That's why their ratings exhibit no significant differences in their perceptions of IWBs.

Additionally, the results of One-way ANOVA test reported significant differences between students' hours of weekly IWB use and their perceptions of using them in language learning classroom. The examination of post hoc results revealed that individuals with '3-5 hours' IWB use differ significantly from '6-10 hours' and '11 hours and more' groups. This implies that the more students are involved in using IWBs, the more their perceptions change during language classrooms. That's why the greatest mean differences exist between those who use more IWBs than those who are at their early stages of IWB experience.

The findings of the present study showed that the highest mean scores for students were ascribed to perceived learning contribution dimension indicating that students are aware of the pedagogical benefits of IWBs (Celik, 2012). They feel that using IWBs by teachers helps them learn more and better understand the lessons particularly when the audio and visual materials are presented in an integrative manner. Furthermore, while admitting the existence of some technical problems in employing IWBs, using IWBs, they think, provides opportunity for them to have access to a wide variety of sources to learn from and this helps them to remember and retain what they learn for a long time. They also feel that IWBs are beneficial in creating meaningful and promising interaction during lessons. The same results were found by Yáñez & Coyle (2011) who conducted a small-scale study that focused on an English language immersion classroom in a British primary school in Spain. Their findings indicated such issues as the children's desire to interact more with the IWB, their frustration with frequently occurring technical problems, and the importance, particularly for the non-native speakers (NNS), of the multimodal properties of the board. Therefore, teachers and course designers should pay more attention to the great enthusiasm revealed by the students and take great care when planning for an active IWB-based classroom. By so doing, they will be able to make it possible for the curriculum and teachers to end up with what Lopez (2006) calls, 'Lighting the flame of learning for English Language Learners'.

The results of the present study also indicated that the students recognize the potential of the new technology for raising their motivation to share knowledge with classmates by means of individual and group presentations. More than two third (70%) of the students expressed their willingness to go to the front of the class to use an IWB because the IWB, they believe, makes it easier for them to be motivated during the lesson, helps them concentrate more on teaching materials and makes learning English more exciting. This suggests that IWBs are useful educational tools which foster students' motivation and involvement in learning activities; attract their attention, increasing concentration on the materials being taught. These findings are supported by the findings of other studies on IWBs (Bell, 2002; Elaziz, 2008; Mathews-Aydinli & Elaziz, 2010, Smith, 2001; Smith et al., 2005; Türel & Johnson, 2012; Schmid, 2006, 2008; Holmes, 2009; Torff & Tirotta, 2010; Yang & Tang, 2014). It should be noted that the motivational aspects of IWB use were received much weight both by teachers and students in their ratings. However, compared with students (69.5%), teachers seem to be more impressed by motivational aspects of IWB use (89%). It would be reasonable to argue that equipped with a comprehensive knowledge and understanding of how IWB technology operates, teachers and students will better manage the teaching and learning processes, make use of the new technology in best possible ways to incorporate audio and visual materials spontaneously and promote the quality of integrating technology in EFL classrooms.

The findings of the present study further demonstrated that teachers and students differ greatly in their perceptions of IWB use. Totally, 80% of teachers agreed with the overall perceptions of IWB use in EFL classrooms while 67% of students agreed with overall perceptions of IWB use. Furthermore, 96% percent of teacher's mean scores and 80.77% of students' mean scores received for all items were found to be fallen within the highest category of the self-developed cut-off points for perceptions of IWB use. Therefore, it can be concluded that teachers have higher perceptions of IWB use than students do. Additionally, the highest mean score for hours of weekly IWB use was observed for females in students group whereas males received the highest mean score in teachers group. Surprising as it may seem, despite differences in male and females Hours of weekly IWB use, both students and teachers who scored highly in their perceptions spent the same amount of time on using IWBs. This implies that time spent on using IWBs plays an important part in shaping teachers' and students' perceptions of using new technology.

The results of qualitative data also supported the findings of quantitative analyses of teachers' self-reported perceptions of IWB use in relation to the general attitudes on the pros and cons of IWB use in EFL classrooms. Most of the interviewees put much weight on the importance of training for the effective use of IWBs, the vital role of IWBs in capturing students' attention and motivating them towards more participation in classroom activities, spontaneous incorporation of IWBs and other related software along with authentic course books containing rich, authentic and up to date materials. However, some teachers believed that IWBs should be employed cautiously and timely considering the main goals of teaching and learning because they are supplementary tools for promoting the quality of teaching and learning process not for entertainment. They were also complaining about the technical inconsistencies due to the breakdown in IWBs during teaching, the inadequacy of training they receive for IWBs during workshops emphasizing that the IWB training courses must be offered continuously so that all teachers would be able to catch up with the new developments in new technology, and develop and update their knowledge and skills of employing IWBs in their practical teaching.
These findings of the qualitative data are broadly in line with Schmid and Schimmack (2010) who also found that teachers, despite having full access to the technology, do not have the required skills and knowledge of how to use ICT in general and IWBs in particular to enhance their practice. Their study shed more light on the fact that IWB use is exploited through 'trial and error' approach which has proved to be ineffective and of no practical advantage to help them enhance their knowledge and understanding of the new technology and its potential applications as an ICT tool in enhancing the quality of teaching practice. Therefore, curriculum developers should bear the greater burden of organizing and offering any desirable and efficient pre-service and in-service training courses, workshops so as to develop the necessary competencies and skills in teachers to manipulate IWBs. A long-term programming in teacher education as well as the required budget is needed to be officially ratified in advance of training pre-service English teachers. Moreover, English Language Teaching (ELT) departments should incorporate required courses on the use of IWBs in their programs with the purpose of developing skills and competencies needed for the effective use of IWB technology. Schmid & Schimmack (2010, p. 211) spell out some of the competencies that can be developed through pre-service and in-service training course as follows:

- designing IWB materials, which support opportunities for learner interaction with the whiteboard and with the learning content
- managing IWB-based activities in a way that ALL learners are provided with opportunities to become actively involved in the learning process

- coherently integrating various multimedia resources in IWB-based lessons by considering issues of pace, cognitive load and learners' active processing of these materials
- enhancing the functionality of the IWB through the use of peripheral hardware and software
- finding and evaluating ready-made digital materials, which can be used in connection with the IWBs.

It is worth noting here that despite having some advantages, technological equipment and facilities presumably have their own challenges and limitations too and are often criticized for their shortcomings. IWBs would, of their very nature, necessarily bear the brunt of this criticism as well. All participants agreed with the fact that using IWBs needs knowledge and skill. Although both students and teachers agree impressively on the benefits and effectiveness of IWBs, one could still argue that IWBs are not the panacea for all our problems encountered during language learning. It is a fact that using IWBs is largely dependent on the availability of such facilities as computers and high-speed Internet networks so as to be able to incorporate audio-visual materials spontaneously. That is, there are some prerequisites of use without which the IWBs will be of no help in classrooms. This predicament of IWB use becomes more acute if we consider the financial problems which schools with limited budgets and limited access to the internet, and inadequate computers in their stock may encounter with in using IWBs.

CONCLUSION AND RECOMMENDATATIONS

This study aimed to present the teachers' and students' perceptions on the effectiveness of IWBs in EFL classrooms in the context of Turkey which is now experiencing a rapid shift from traditional boards towards using newly developed IWBs in Turkish schools, institutes and educational settings beginning with 'Fatih project'. The aim was to find out how teachers and learners perceive the incorporation of new technology into school curriculum will affect learning English as a foreign language without providing any value judgments on the potential and virtual contributions of the new innovation to the EFL classroom.

The results of self-report questionnaires showed that Turkish EFL students and teachers have overall positive perceptions and attitudes towards IWBs and, as studies in the field also indicate, they consistently report high levels of enthusiasm for the IWB technology. They like IWBs and claim that they feel comfortable using it, and also believe that it is a very innovative and powerful support for language acquisition and has a best supplementary function in promoting language proficiency as a beneficial teaching tool. Therefore, curriculum planners, administrators and technology decision makers should take care of the growing interest toward new technology in order to ensure the translation of this enthusiasm and interest to IWBs into effective, purposeful and promising practice. Indeed, the IWB technology serves as a medium between technical innovations and pedagogical practice. Therefore, the IWB use requires more skills and creativity for which the appeal is immediate and irresistible, and for which the IWB is an important 'stock- in- trade'.

It was stated that one of the advantages of IWBs is the opportunity to incorporate various types of materials into teaching process. Further research in IWB use in L2 is required to give much weight to the in-depth investigation to find out whether EFL teachers use different pedagogical approaches to integrate IWBs into their teaching practice. Moreover, future research should attempt to examine how the perceptions of experienced and novice teachers differ with respect to their capacity to comply with new technology and the integrative skills in using IWBs.

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