

RESEARCH ARTICLE

# A Study of Taiwanese Elementary School English as a Foreign Language: Teachers' Beliefs, Advantages, and Difficulties of Using Interactive Whiteboards

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**Abstract:** Educational technology plays an increasingly significant part in the English as a Foreign Language (EFL) teaching and learning process. The interactive whiteboard (IWB) can be effectively used by language teachers to enhance the effectiveness of their curriculum and instruction. This study explored the beliefs of Taiwanese elementary school teachers regarding the use of IWBs when teaching EFL. It also explored possible advantages and difficulties they might face during their use of the IWB. This study adopted the mix-designed method, including quantitative and qualitative methods. To achieve this aim, this study was conducted with a sample of 74 EFL teachers teaching in various elementary schools (Grades 3 to 6) in Central Taiwan. The quantitative findings of this study indicated that there were no significant differences between various levels of educational background (Bachelor's degree and Master's degree) of elementary school EFL teachers' beliefs to IWB use in the classroom setting. Overall, the results also showed that there were significant differences based on the various lengths of teaching experience of elementary school EFL teachers' affecting their beliefs toward IWB use, including instructional effects of IWB use, motivational effects of IWB use, the usability of IWBs, and frequency of IWB use. In addition, the qualitative results have shown some of the advantages and difficulties of using IWBs. The advantages included enhanced teaching efficacy, excellent teaching demonstration tools, better stimulation of students' learning motivation, better environmental protection, and energy-saving. On the other hand, the difficulties that teachers faced included difficulties using IWB hardware and software.

**Keywords:** EFL classroom, interactive whiteboard, teachers' advantages, teachers' beliefs, teachers' difficulties

As information technology keeps improving and prices become more consumer-friendly, electronic tools are being developed for teaching activities, and teaching assistant tools are created along with innovative applications. The innovative teaching model of information and communication technology (ICT) has become a significant issue for modern countries and vital to their information education. An interactive

whiteboard (IWB) is an advanced technology used in classroom teaching (Bacon, 2011). An IWB is an input-output device connecting a computer and a projector through a computer interface as well as an ICT's state-of-the-art technology incorporated into education and applied in teaching in various countries, such as Britain, America, Canada, Australia, Japan, and so on (Beauchamp, 2004; Beauchamp & Prakinson, 2005).

Information technology has become a significant component in the 21<sup>st</sup>-century classrooms, with districts implementing it to improve teaching, facilitate learning, and increase learners' involvement in classrooms (Campbell, 2010; Kocak, & Gulcu, 2013). The integration of information technology with teaching aims to enhance students' learning performance in their fields and advance students' ability to manipulate information as well. Teaching materials and teaching itself make information technology become a necessary teaching and learning tool so that the use of information technology becomes part of daily teaching activities in the classroom. Information technology integrated into teaching is a pedagogical method that the teacher in a limited information environment conducts teaching in all fields with information-related equipment, which assists in teaching preparation and goes with teaching activities, in order to cultivate students' active learning attitudes, improve teaching outcomes as well as learning effects, and then achieve the goal of teaching (Chen, Belkada, & Okamoto, 2004)

One example of the adoption of technology in classrooms is the IWB, which has the potential to improve instruction and learning experiences by offering useful methods to learners to interact with electronic context (Campbell, 2010). As a part of the ICT integration process, the IWB was viewed as the one technology most invested in, especially by European countries such as England, Spain, and Turkey (Holmes, 2009). According to McIntyre-Brown (2011), England has the highest IWB penetration rate (73%) in the world and various countries, including Denmark (50%) and the U.S.A. (35%), have increased IWB usage rates in classrooms by 2010. On the whole, the average rate of adoption for Asian countries is still lower than in many European countries and America. Based on this, since 2007, Taiwan's Ministry of Education has urgently promoted "the Plan of ICT Teaching Integrated with Information," in which hundreds of elementary schools and junior high schools in 15 counties and cities have been fully subsidized to introduce IWB. It is hoped that the blackboard teaching assisted with whiteboards can enhance the willingness of elementary schools and junior high schools to integrate information into teaching (Hsu, 2010).

There is a growing interest in and attention paid to English education. Since 2001, the English language is one of the required courses embedded in the Taiwanese elementary school curriculum, and special

attention is devoted to it in society. As specified in the nine-year integrated curriculum guidelines, the goals of English curriculum are (1) to help students develop basic communication skills in English; (2) to cultivate students' interests in learning English; and (3) to promote students' awareness of local and foreign cultures and customs. The pedagogical emphases of English instruction at the elementary stage are put on developing students' listening and speaking proficiencies in the first years (i.e., 3<sup>rd</sup> and 4<sup>th</sup> grades) with the gradual integration of reading and writing in the 5<sup>th</sup> and 6<sup>th</sup> grades (Ministry of Education, 2000). With respect to the increase of IWB technology investment and involvement in Taiwanese elementary schools, there is a strong need for exploration of and improvement in IWB use.

Considering the significance of EFL teachers' beliefs about the influences of IWB use in classroom settings, this study focuses on the exploration of Taiwanese EFL teachers' beliefs about using IWB advantages as well as difficulties that they face with the use of IWB in the classroom setting. Hence, this study will address the following questions:

1. Do various levels of educational background (Bachelor's and Master's degree) have an impact on the Taiwanese elementary school EFL teachers' beliefs toward IWB use in the classroom setting?
2. Do various lengths of teaching experience (five or more years, two-five years, and less than one year) have an impact on the Taiwanese elementary school EFL teachers' beliefs toward IWB use in the classroom setting?
3. What advantages and difficulties do the Taiwanese elementary school EFL teachers face when they use IWB in the classroom setting?

## Literature Review

IWB is a large-sized touch panel that connects to a computer and a projector for operation. Originally, it was a commercial design used in the office. In recent years, it has been largely introduced to schools and classrooms for teaching and has become a relatively new educational technology. Its hardware includes a sensitive electronic panel and a sensor: (1) A sensitive electronic panel is equal to a touch panel;

(2) a PC monitor, which looks similar to a traditional whiteboard; and (3) a sensor as a stylus corresponding to a mouse, which has the feature of digital ink when writing. An IWB must connect to a computer and a projector to develop its features (Glover & Miller, 2001; Bahadur & Oogarah, 2013). On the face of it, there is not a huge difference between an IWB and a traditional blackboard. However, when an IWB connects to a computer and a projector, it can get online or conduct satellite transmission through its drive software to form a human-machine, interpersonal, and highly interactive teaching system.

An IWB has the function of multimedia integration merged into the teaching environment. Through the two-way interaction between a whiteboard and a computer, not only can the teacher save all of the contents and interpretations written on the IWB as digital files, but he or she can also directly use all types of application software on the IWB; by doing so, interactions among the teacher, students, media, and information may become highly personalized (Hall & Higgins, 2005).

IWB is one of the best forms of media that integrate multimedia into the teaching environment. Not only does it possess the features of the traditional blackboard, but it is also able to integrate teaching resources and become a teaching display platform. Users can directly control the computer on the whiteboard to facilitate browsing webpages together in class or to activate other teaching software for circling, drawing, and writing. The teacher can directly lecture at the podium without walking back and forth to operate other teaching media to be able to make better eye contact with students and attract students' attention (Hodge & Anderson, 2007). An IWB uses a computer to open teaching materials, which are then projected on to the electronic whiteboard by a digital projector. The IWB assists the teacher's lecture with several features, such as enlargement, concealment, and so on. Also, the teacher plays music or sound effects to satisfy students' visual or audio needs. Students can go to the podium in person to interact with the contents or answer questions and save the contents to share personal opinions with each other to improve their class interactions as well as participation (Kotrlík & Williams, 2003; Bajoolvand, Mahmoodi, & Vafaeseresht, 2014).

There is no denying that a number of researchers stated that the use of IWB has a positive impact on

teaching and learning (Hall & Higgins, 2005; Hodges & Anderson, 2007; Shenton & Pagett, 2007; Holmes, 2009; Hsu, 2010; Mathews-Aydinli & Elaziz, 2010). Generally speaking, teachers could use IWBs for various reasons. These include retaining attention, clarifying complex ideas, simplifying the teaching process, and enhancing learners' interactions (Jang & Tsai, 2012). According to Jwaifell and Gasaymeh (2013), the use of IWB facilitates the teaching-learning process and makes it more enjoyable and fun. Besides this, Duran and Cruz (2011) indicated that teaching with IWB is more fun, more engaging, more exciting, and impacts enjoyment. Celik (2012) mentioned that IWB could be used in the classroom setting to increase student engagement during the learning process.

In terms of attitudes, various studies have found that teachers have positive attitudes toward working with IWBs. For example, Mathews-Aydinli and Elaziz (2010) indicated that teachers expressed positive attitudes toward IWB technology. In the same line, Duran and Cruz (2011) also showed that learners were more motivated and enjoyed lessons in which IWBs were used, as these lessons were more interesting and exciting. Bakadam and Asiri (2012) also showed that most teachers express a positive belief that IWB could be used as an efficient tool to present teaching content and that it supports classroom interaction. In general, teaching and learning activities with IWB may include the following features and benefits:

1. Interactive feature: it creates an interactive control environment composed of a computer and a projector (Higgins, Beauchamp, & Miller, 2007)
2. Writing feature: it gives you the ability to scribble or erase with a finger or use a handwriting pen on the IWB (Smith, Higgins, Wall, & Miller, 2005).
3. Accumulative source material database: it applies the software to provide a large database of source material for teaching (Solvie, 2004).
4. Camera feature: it is able to capture all or partial pictures with any software and record the operating or writing processes into videos (Beauchamp, 2004).
5. Exporting feature: it is able to transfer the in-class writing contents into file formats, including images, HTML, PPT, PDF, and others (Smith, 2008).

6. Elevating teaching efficiency: continuing the teacher's habit of writing and teaching at the same time while the digital contents are displayed (Torff & Tirota, 2010).
7. A supreme teaching display tool: presenting excellent pictures with software (Higgins et al., 2007).
8. A variety of learning types: multiple learning in tactile, audio, and visual aspects, which creates the best learning outcomes (Solvie, 2004).
9. Being suitable for all age brackets: after IWBs are available on campus, they become popular among all students, from elementary school students to postgraduates (Smith et al., 2005).
10. An important device for remote teaching: allowing remote learners to gain better simultaneous learning outcomes (Beauchamp, 2004).
11. Using computers to develop the most effective teaching outcomes: compared with a personal computer classroom, only a single electronic whiteboard and a single computer are needed to help the whole class learn together, so their cost is lower and they are more effective (Torff & Tirota, 2010).
12. A clean, healthy, and environmentally friendly pedagogical tool: teachers and students no longer need to endure chalk dust in the air, and they can add a lot of points to classroom sanitation as well as the health of teachers and students (Beauchamp, 2004).
13. Collocating with the use of instant image teleprompter: while the teleprompter projects real objects into pictures, the teacher uses the IWB to help students take notes and label key points, which results in the best effects (Smith et al., 2005).

In terms of difficulties facing English teachers in using interactive whiteboards in their classes, Ibrahim and Abdelmoneim (2014) stated that these difficulties are categorized into four kinds: teachers, school administrations, technical supports, and students factors. Based on their research analysis, these difficulties and challenges are due to many reasons. Those reasons are instructors' lack of computer competency, ongoing technical support is insufficient,

and the students are more familiar with technology than their instructors are. All in all, those difficulties and challenges might interact to hinder IWB integration into instruction and learning English.

## Methods

For this study, a mix-designed method was carried out. Firstly, a quantitative descriptive research method was employed to explore the beliefs of EFL teachers regarding the current state of IWB use at schools. Secondly, qualitative research explored the advantages and difficulties that EFL teachers faced in terms of using IWB. Data was collected from EFL teachers via a questionnaire and semi-structured interviews adopted specially for this study.

### *Participants*

This study was conducted with a sample of 74 EFL teachers teaching in various elementary schools in Central Taiwan. Sixty-two of them hold a Bachelor's degree in teaching English, and 12 had achieved a Master's degree. A few participants ( $n=16$ ) were novice teachers whose teaching experience was less than one year. A total of 41 participants had 2–5 years of teaching experience, and a sum of 17 participants had five or more years of teaching experience. All the participants have sufficient knowledge of and have had experience with IWBs and also were familiar with the issues of IWBs in practice at their schools.

### *Data Collection Instruments*

The reliability and validity of the questionnaire were explored before using it with the participants in this study. The reliability of the questionnaire was estimated by Cronbach's alpha, and it showed a coefficient of 0.83 (Beauchamp, 2004; Wall, Higgins, & Smith, 2005). A total of 22 scale items ranging from strongly disagree to strongly agree are used in this questionnaire, and the questionnaire was divided into four categories. The first category includes items that related to the effects of IWBs on teaching in Taiwanese EFL classrooms, whereas the second category has items addressing the motivational issues of IWBs. The third category includes items regarding the usability of IWBs in the EFL classroom setting. The last category includes items addressing the effects of frequency of IWB use. Regarding the semi-structured interviews, a number of face-to-face interviews ( $N=10$ ) were used in

this study. The 10 participants had various educational backgrounds and teaching experience.

### Data Analysis

All participants completed the questionnaire by mail. In the questionnaire, relevant data extracted were analyzed using an SPSS 11.0 (Statistical Package for the Social Sciences). Internal consistency reliability (Cronbach's alpha) was analyzed to show how well a group of items measured the same concept, and the overall Cronbach's alpha reliability was 0.89. An independent-samples t-test was conducted to determine whether there was a significant difference between various levels of educational backgrounds (Bachelor's degree and Master's degree) of Taiwanese elementary school EFL teachers' beliefs to IWB use in the classroom setting. A one-way ANOVA was performed to examine whether there were significant differences between various levels of teaching experience of Taiwanese elementary school EFL teachers' beliefs to IWB use in the classroom setting. The data were analyzed to obtain descriptive and inferential statistics, the results of which are reported in the next section.

This research aims to understand the advantages and difficulties the teachers encounter when using IWB for teaching. Once completing in-depth interviews, we started sorting transcripts which must completely present the intentions of the interviewees. Next, the transcripts are analyzed by means of the ground theory, which mainly focuses on data itself. Gradually, useful patterns are discovered from the data using scientific methods, and then they are categorized and compared

repetitively until no new concept shows up, in order to establish the initial theory.

### Results

The result of an independent-samples t-test showed that there were no significant differences between the various levels of educational background (Bachelor's degree and Master's degree) of Taiwanese elementary school EFL teachers' beliefs toward IWB use in the classroom setting, owing to  $p > .05$  (see Table 1).

The results of a one-way ANOVA showed that there were significant differences between the various lengths of teaching experience of Taiwanese elementary school EFL teachers' beliefs toward IWB use in the "instructional" domain owing to  $F(2,71) = 47.21, p < .0001$  (see Table 2). To be specific, teachers who had five or more years of teaching experience have a more positive belief of the instructional effects of IWB use than teachers who had 2–5 years of teaching experience. Teachers who had 2–5 years of teaching experience have a more positive belief of instructional effects of IWB use than teachers who had less than one year of teaching experience (see Table 7).

The results of a one-way ANOVA showed that there were significant differences between the various lengths of teaching experience of Taiwanese elementary school EFL teachers' beliefs toward IWB use in the "motivational" domain owing to  $F(2,71) = 515.55, p < .0001$  (see Table 3). To be specific, teachers who had five or more years of teaching experience have a more positive beliefs toward the motivational

**Table 1**

*An Independent-Sample T-Test of Various Levels of Educational Background (Bachelor's Degree and Master's Degree) of Taiwanese Elementary School EFL Teachers' Beliefs Toward IWB Use*

Education Level	BA	MA	P-value
	Mean (SD)	Mean (SD)	
Number	44	30	
ALL	3.51 (0.58)	3.52 (0.634)	0.936
Instruction	3.26 (0.298)	3.30 (0.303)	0.601
Motivation	3.71 (0.903)	3.74 (0.993)	0.993
Usability	3.56 (0.729)	3.59 (0.688)	0.867
Frequency	3.73 (1.09)	3.65 (1.23)	0.777

effects of IWB use than teachers who had 2–5 years of teaching experience, and teachers who had 2–5 years of teaching experience have a more positive belief toward the instructional effects of IWB use than teachers who had less than one year of teaching experience. (See Table 7)

The results of a one-way ANOVA showed that there were significant differences between the various lengths of teaching experience of Taiwanese elementary school EFL teachers' beliefs toward IWB use in the "usability of IWB" domain owing to  $F(2,71) = 28.86$ ,  $p < .0001$  (see Table 4). To be specific, teachers who had five or more years of teaching experience have a more positive belief toward the usability of IWB than teachers who had 2–5 years of teaching experience. Teachers who had 2–5 years of teaching experience

have a more positive belief toward the usability of IWB than teachers who had less than one year of teaching experience (see Table 7).

The results of a one-way ANOVA showed that there were significant differences between the various lengths of teaching experience of Taiwanese elementary school EFL teachers' beliefs to IWB use in "frequency of IWB use" domain owing to  $F(2,71) = 139.28$ ,  $p < .0001$  (see Table 5). To be specific, teachers who had five or more years of teaching experience have a more positive belief regarding frequency of IWB use than teachers who had 2–5 years teaching experience, and teachers who had 2–5 years of teaching experience have a more positive belief regarding frequency of IWB use than teachers who had less than one year of teaching experience (see Table 7).

**Table 2**

*One-Way ANOVA of Various Lengths of Teaching Experience for Taiwanese Elementary School EFL Teachers' Beliefs Toward IWB Use in "Instructional Effects of IWB Use" Domain*

Sources	SS	df	MS	F	P
between groups	3.72	2	1.86	47.21	< .0001
within groups	2.80	71	0.03		
total	6.52	73			

**Table 3**

*One-Way ANOVA of Various Lengths of Teaching Experience for Taiwanese Elementary School EFL Teachers' Beliefs Toward IWB Use in the "Motivational Effects of IWB Use" Domain*

Sources	SS	df	MS	F	P
between groups	59.52	2	29.76	515.55	< .0001
within groups	4.09	71	0.05		
total	73				

**Table 4**

*One-Way ANOVA Between the Various Lengths of Teaching Experience of Taiwanese Elementary School EFL Teachers' Beliefs to IWB Use in "Usability of IWB" Domain*

Sources	SS	df	MS	F	P
between groups	16.39	2	8.19	28.86	< .0001
within groups	20.16	71	0.28		
total	73				

Overall, the results of a one-way ANOVA showed that there were significant differences between the various lengths of teaching experience of Taiwanese elementary school EFL teachers' beliefs toward IWB use, including instructional effects of IWB use, motivational effects of IWB use, usability of IWB, and frequency of IWB use domains owing to  $F(2,71) =$

$481.17, p < .0001$  (see Table 6). On the whole, teachers who had five or more years of teaching experience have a more positive belief than teachers who had 2–5 years of teaching experience, and teachers who had 2–5 years of teaching experience have a more positive belief than teachers who had less than one year of teaching experience (see Table 7).

**Table 5**

*One-Way ANOVA of the Various Lengths of Teaching Experience of Taiwanese Elementary School EFL Teachers' Attitudes Toward IWB Use in the "Frequency of IWB Use" Domain*

Sources	SS	df	MS	F	P
between groups	75.63	2	37.81	139.28	< .0001
within groups	19.27	71	0.27		
total	94.90	73			

**Table 6**

*One-Way ANOVA of the Various Lengths of Teaching Experience of Taiwanese Elementary School EFL Teachers' Beliefs Toward IWB Use in Overall Domain*

Sources	SS	df	MS	F	P
between groups	24.32	2	12.16	481.17	< .0001
within groups	1.79	71	0.02		
total	73				

**Table 7**

*The Comparisons Between the Various Lengths of Teaching Experience of Taiwanese Elementary School EFL Teachers' Beliefs Toward IWB Use in Each Domain*

Teaching Years	O M(SD)	T M(SD)	F M(SD)	F Value	P Value	comparison
N	19	35	20			
A11	1.99(0.11)	2.27(0.16)	3.44(0.17)	481.2	< .0001	F-T,F-O,T-O
Instruction	2.11(0.18)	2.16(0.16)	2.64(0.26)	42.7	< .0001	F-T,F-O,T-O
Motivation	1.88(0.17)	2.34(0.30)	4.15(0.14)	515	< .0001	F-T,F-O,T-O
Usability	2.16(0.45)	2.37(0.47)	3.33(0.68)	28.9	< .0001	F-T,F-O,T-O
Frequently	1.68(0.62)	2.33(0.54)	4.30(0.34)	139	< .0001	F-T,F-O,T-O

Note: O refers to teachers' teaching experience with less than one year.

T refers to teachers' teaching experience between 2–5 years.

F refers to teachers' teaching experience with more than five years.

In terms of the qualitative data analysis, all interviews were video-recorded. The interviews were analyzed on the basis of thematic view. Thematic analysis is a method of dealing with data that involves analyzing and organizing the data. The main step of thematic analysis is open coding and arranging the data under emerging themes through the conversation between the interviewees and the researcher (Holliday, 2007). This analysis method helps me to explore the advantages and difficulties that EFL teachers face when using IWBs. The main findings of the qualitative analyses are the following:

Advantages of using IWB include:

- (1) Enhancing teaching efficacy. It can facilitate teachers' lecturing habits of teaching and writing at the same time, and let teachers directly conduct operating, writing, and applying other software programs on the whiteboards in the teaching process, so that the generated vacuum period caused by interface changes or program changes can be shortened to promote the coherence of learning process. Also, it closely matches teachers' teaching ideas (Participant B).
- (2) Excellent teaching demonstration tools. IWBs are flexible, applicable, and diversified tools. They can present visual teaching materials, such as coloring shapes, text annotations, hiding objects, fast movement, image enlargement and reduction, and so forth. These functions can increase teaching independence as well as flexibility. Additionally, voices, images, animations, software, and network resources can be added. Such complex teaching materials can make teachers' lecturing more convenient (Participant D).
- (3) Stimulating students' learning motivation. All types of teaching media effects made by the use of IWB, as well as the presentable extracurricular information, not only can attract students' learning attention to stimulate their self-learning motivation but also can enlarge the range of learning (Participant F).
- (4) The best tools for interactive teaching. Using IWB causes an increase in opportunities for interactive learning between teachers and students or among students. Via IWB, visual and conceptual image teaching materials are

displayed to draw students' attention and enhance their participation so as to raise the teaching interaction (Participant G).

- (5) Aiming at environmental protection and energy saving. Using IWB can avoid teachers' and students' exposure to chalk dust and also can decrease the produced waste when cleaning, keeping classrooms in the cleanest and most sanitary condition. Besides, teaching materials can be repetitive; thus, IPW reduces the use of paper (Participant I).

The difficulties of using IWB include hardware and software problems. Reasons for bad hardware equipment are the following:

1. The single writing range of IWB is fixed (Participant A).
2. The intense light of a single beam projector will harm our eyes (Participant C).
3. The enlargement of the IWB picture should be advanced via technology (Participant D).
4. IWB needs to be repositioned (Participant E).
5. The installation of IWB is subject to old equipment (Participant G).
6. The framed IWB wastes more space (Participant I).
7. IWB teaching is affected by classroom space allocation (Participant J).
8. Although IWBs are being placed in classrooms, all difficulties, including installation position, seat arrangement, lighting equipment, old equipment, and so on, must be taken into account (Participant C).
9. Because IWBs are new information equipment, the related source materials are not very complete and abundant. As a result, there are often limitations on the course material design or in-class operation (Participant E).

Reasons for software response delays include:

1. Writing on an IWB is slower than that on a blackboard (Participant B).
2. The functions of an IWB are not complicated but will cause delays (Participant F).
3. Applying IWBs to teaching may not be able to run effectively in class and may even affect the teaching process owing to software response delays (Participant A).

## Discussion

The results of this study indicated that most EFL Taiwanese elementary teachers have positive beliefs toward the IWBs in the classroom, and the finding corresponds with Hsu's (2010) and Holmes's (2009) findings. The quantitative findings of this study indicated there were no significant differences between the various levels of educational backgrounds (Bachelor's degree and Master's degree) of elementary school EFL teachers' beliefs toward IWB use in the classroom setting. Overall, the results also showed that there were significant differences between the various lengths of teaching experience of elementary school EFL teachers' beliefs toward IWB use, including instructional effects of IWB use, motivational effects of IWB use, the usability of IWB, and frequency of IWB use. On the whole, teachers who had five or more years of teaching experience have a more positive belief than teachers who had 2–5 years of teaching experience, and teachers who had 2–5 years of teaching experience have a more positive belief than teachers who had less than one year of teaching experience.

Regarding the teachers' responses related to instruction, the participants agreed that IWBs were a good supplement for teaching. In a study by Duran and Cruz (2011), participants stated that they were comfortable with using IWBs in the classroom. On the contrary, analysis of the participants' interviews revealed some difficulties and challenges toward IWBs. Most of the teachers positively stated that the IWB did not bother them but, rather, makes instruction more effective and comfortable. Some of the teachers mentioned the problems they faced, including software and hardware problems. In short, applying IWB to teaching can benefit teachers and students a lot, but there are still some problems, such as bad hardware and software equipment, insufficiency of teachers' information ability, limits still existing in interactions, and so forth. In terms of this situation, training plays an important role in using technological devices and highlighted teacher training in using IWBs are significant components for effective and efficient implementation (Yudt & Columba, 2011). Basically, teachers need more training to learn how to deal with technical and system problems. They also should be familiar with all the functions offered by the IWBs. The school authorities should have classes equipped with all versions of the IWBs. As a matter of fact, not every

subject can be presented by IWBs, so schools must be required to provide teachers with content and training that can be presented using this technology. English teachers are strongly recommended to participate in training programs to ensure better implementation of IWB in foreign language teaching classes, and programs that help them to cope with technical and system problems. In so doing, teachers will be more positive, confident, and motivated when using IWBs. In other words, the more teaching experiences the teachers have, the more positive the attitude the teachers take. Further, understanding how to use all the functions offered by the IWBs will ensure better outcomes in integrating IWBs in EFL classes.

## Concluding Remarks

As teachers of Generation X, when facing the children of Generation N (N for Net), I cannot help but think that "innovation" is the new educational thinking that teachers must face and shoulder when traditional teaching strategies and techniques have gradually failed to meet the expectations of the new generation of students for classroom teaching. Educators apply information technology to classroom teaching to improve the in-class interaction between teachers and students as well as induce students' initiative to explore and think actively. That is the true meaning of integrating information into teaching. As the teaching activity combines the IWB, its teaching process will be different from that of the traditional teaching in the early, middle, and late periods. Before teaching, in addition to the preparation of teaching materials, teachers also need to get familiar with electronic text content and related network resources when using the IWB for teaching. While teaching, teachers not only can impart knowledge from books to students but can also combine network resources to increase students' breadth and depth of knowledge. After teaching, the IWB-related software also provides teachers with more diverse ways to view students' learning outcomes and performances. In the teaching process, the degree of integration of relevant information equipment into teaching depends on the teachers' teaching experience and needs. Under the premise that teachers are familiar with the operation of relevant information equipment, integrating information technology into teaching will bring students more knowledge and common sense besides the book. In today's era of Internet knowledge

explosion, if the curriculum can combine current issues in a timely manner, not only can it impress students on their learning, but it can also extend the meaning of students' learning.

In the process of integrating software and hardware resources, the role played by teachers is becoming more and more important, especially after implementing the integration of information technology into teaching. Regardless of the IWB or digital peripheral equipment, teachers need to screen software (such as electronic text and network resources) as well as select appropriate information equipment for integration, so that merging the integrated information into teaching can help students with their learning outcomes. Therefore, teachers play a very important role. After using IWB teaching, how to introduce information into teaching at the appropriate "time" to improve students' learning outcomes is the goal that teachers must study intensively in the future.

The IWB application can ease the double-peak phenomenon in English learning. The English double-peak phenomenon is very obvious in the stage of elementary school. However, the interactive characteristics of the IWB can help the students slowly reduce their stress on the unfamiliar learning content and feel the joy and accomplishment of learning English (Bakadam & Asiri, 2012). English teaching combined with multimedia equipment (such as physical projector and instant feedback system) can make students more aware of teachers' instructions in class. Teachers can also use multimedia resources to examine students' learning outcomes at any time. Compared to traditional teaching aids, multimedia resources can help students understand teachers' instructions more quickly. For example, in combination with a physical projector, the teacher can instantly enlarge a student's work and help the student develop the self-examination ability through observation, as well as his own or others' sharing. Using the instant feedback system to arrange and ask questions, different from the past paper and pencil test, students actively take part in asking questions, and teachers can also timely assess the learning outcomes of the day.

In addition, due to a large number of classes and students for English teachers to teach as well as limited time and number of people for remedial teaching which can be provided, teachers offer IWB to the students who need to strengthen their skills for practice after class. Timely remediation and guidance can help the

students leave a deep impression on the content that is difficult to understand. Many students who originally had a sense of rejection of English remedial teaching gradually participated actively. The IWB makes the arrangement of questions more clearly and more interesting (for example, moving the English letters with fingers on the whiteboard and combining words) so that the children who have lower participation in class can also actively publish their ideas.

Colorful animations, as well as sound and light effects, can arouse the participation willingness of children with slow processing speed. Take cooking as a metaphor. All kinds of digital English teaching materials and English electronic texts are like all kinds of ingredients. Electronic whiteboards are like advanced cooking tools, whereas English teachers are chefs. No matter how fresh the ingredients are and how easy-to-use the cooking tools are, the chefs should use their professions to choose the ingredients based on the customers' needs and make good use of the tools, so that a colorful, aromatic, and delicious dish can be completed. Therefore, the IWB English teaching also requires teachers to continue their advanced studies and professional training to make the IWB combined with the English learning materials achieve the best effect so that students cannot help but fall in love with English learning.

### **Declaration of ownership**

This report is my original work.

### **Conflict of interest**

None.

### **Ethical clearance**

This study was approved by the institution.

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## Appendix A

### Teachers' Responses to the Questionnaire Items

1. IWB gives me more time to interact with students easily.
2. IWB restricts the movement of students in the classroom.
3. The way I give instruction has been changed since I began to use an IWB.
4. IWB helps me to manage instructional time effectively.
5. IWB facilitates classroom management for me.
6. IWB provides advantages to me to make course content more visual.
7. IWB facilitates discussions of the content.
8. IWB helps me to share content for teamwork in the class.
9. IWB helps me to use the computer and projector more effectively than before.
10. I feel comfortable when I use IWB in teaching.
11. I am interested in technology use in the classroom.
12. I feel confident in using an IWB to design new instructional situations.
13. Using an IWB makes me active.
14. I enjoy teaching with an IWB.
15. I notice my IWB motivations are improving day by day.
16. Learning how to use an IWB is essential to me.
17. Because of using an IWB, I feel more prepared for instruction.
18. IWB can be used for all language skills.
19. My course content is suitable for use with an IWB.
20. IWB can be used with various instructional methods and techniques.
22. The more frequently I use an IWB and continue to practice, the more I improve my IWB competency.
23. The more frequently I use an IWB, the more I increase my positive attitude towards IWB.