6-2015

Getting On Board: Investigating the Opinions and Attitudes of ESL Teachers on the Use of Interactive Whiteboards in the ESL Classroom

Casey M. O'Donnell
St. Cloud State University

Getting On Board: Investigating the Opinions and Attitudes of ESL Teachers on the Use

of Interactive Whiteboards in the ESL Classroom

by

Casey M. O'Donnell

A Thesis

Submitted to the Graduate Faculty of

St. Cloud State University

in Partial Fulfillment of the Requirements

for the Degree

Master of Arts in

English: Teaching English as a Second Language

June, 2015

Thesis Committee:
John Madden, Chairperson
Choonkyong Kim
Robert Raymond

Abstract

The growth in popularity of interactive whiteboards (IWBs) in K-12 classrooms in the United States has been immense over the course of the last fifteen years (Hennessy & London, 2012; Shenton & Pagett, 2007; Sundberg, Spante, & Stenlund, 2012). Both teachers and students have expressed favorable reactions to IWB implementation into the classroom. There have been a number of different studies surveying the thoughts and feelings of teachers and students on their use of IWBs. However, there has not been an interview-based study that looks at the viewpoints of teachers from the upper Midwest. The aim of this study is to investigate the opinions and attitudes of four ESL teachers on their use of IWBs in a K-12 classroom setting. The four participants' answers revealed that they believe IWBs to be a very powerful, useful tool to have in the classroom. However, they did not feel they received adequate training with the technology. Therefore, for the IWB technology to be used more efficiently and effectively in schools, more training must be provided for the educators.

Acknknowledgments

I would like to acknowledge a number of individuals who helped me complete my thesis. First, I would like to thank my chairperson, Dr. John Madden, and my other two committee members, Dr. Choonkyong Kim and Dr. Robert B. L. Raymond, for giving me so much guidance and direction during the entire process. All three members were incredibly helpful in providing feedback, offering different perspectives on technology use, and suggesting key referential texts. Second, I would like to thank Anis Rahman for his generous friendship over the past three years. His keen sense of humor made the demanding academic load a little lighter. Finally, I would like to thank my loving parents for all of their kindness and support. I cannot think of two better role models a person could have.

Table of Contents

List of Tables

Chapter I: Introduction

Statement of Purpose

The use of interactive whiteboards (IWBs) in K-12 classrooms has become increasingly popular in the United States and Europe over the course of the last 15 years (Hennessy & London, 2012; Shenton & Pagett, 2007; Sundberg, Spante, & Stenlund, 2012). More specifically, in the United States, roughly 41% of schools have implemented IWBs into their classrooms (Hennessy & London, 2012). Both teachers and students alike have expressed positive reactions to the flexibility, audio and visual interactivity, and tactile nature that this new technology allows for. However, despite much of the acclaim, there have been some critics that view IWBs as being too technology-centered (Shenton & Pagett, 2007) and too lacking in student sociocultural learning. This paper explores four ESL teachers' personal thoughts and opinions on their own usage of IWBs in K-12 classrooms in St. Cloud, Minnesota. Through teacher interviews, this paper investigates what IWB activities are being conducted, what opinions ESL instructors have of this technology in their own classrooms, and what kind of teacher training is being provided. IWBs are quickly becoming a daily feature of teaching and learning in K-12 classrooms. Therefore, it is becoming increasingly important to research this technology, understand its affordances and constraints, and, finally, be conscious of the pedagogical consequences that come with its classroom utilization.

Significance of the Study

This type of study is important in gaining a firmer understanding about the opinions, attitudes, and needs of educators who use interactive whiteboards frequently in their teaching. A number of surveys and interviews have been conducted in other countries such as England,

Turkey, and Sweden, but not many have been conducted in the United States. By gaining more understanding of how the local ESL instructors feel about and utilize IWB technology, local schools may be able to better implement its use in the classroom. For ESL instructors, gaining a better understanding of the benefits and limitations of IWBs may cause them to reflect on their own usage and perhaps modify their pedagogical approach. ESL instructors may also see that others in their field share their feelings and concerns about adequate training with IWB technology. Finally, in regards to the general community, this study allows parents to have a better awareness of the ESL teachers' attitudes and opinions towards using this technology to instruct their sons and daughters.

Why I Chose this Topic

I chose the topic of interactive whiteboards for two major reasons. First, its popularity in schools is growing at an incredible rate, especially amongst U.S. and European countries. Second, I have never used an interactive whiteboard until this year, and that experience has been minimal. Therefore, I felt it was necessary to familiarize myself with a technology that I suspect will play a significant role in my teaching in the coming years. By investigating other educators' experiences with this technology more deeply, I think I will better prepare myself for my first years of teaching.

Chapter II: Literature Review

The literature review is composed of five sections. First, it opens with a brief overview of the hardware and software components of the technology. Next, it briefly touches on the theoretical support for the technology, followed by the benefits that come with its usage. This then leads to the possible changing of student-teacher dynamics of the classroom. The final section discusses the limitations of the technology and the pedagogical concerns that come with its implementation in the classroom. All of these literature review sections inform the research questions which investigate the opinions of four public school ESL instructors in Minnesota on their use of IWBs in the classroom.

The Hardware and Software of IWBs

An IWB is a large, touch-sensitive computer screen and projector that is capable of being controlled by a personal laptop or by individuals touching the interactive screen. Students and teachers use a stylus pen to write, erase, and drag and drop items on the screen. Educational programs are able to be downloaded from the Internet or purchased from a retailer and installed manually (Coyle, Yanez, & Verdu, 2010). IWBs offer a wide variety of different teaching and learning features that conventional blackboards and whiteboards do not. These features have made for the widespread adoption of this technology in the classroom.

Accompanying Remote Devices

IWBs are also compatible with handheld computers or tablets that allow learners to engage with the main IWB in the front of the room. This allows students who are shy or reluctant to participate an opportunity to engage with the content more directly (Hennessy &

London, 2012). Also, remote devices allow educators more options to include whole class

participation when planning their activities. For example, when a student or a group of

students is up at the board, the other students may be working on auxiliary tasks that may

supplement the main lesson (2012).

Open Source Program Alternatives

Much of the IWB's software must be purchased, thus adding to the financial burden of

the educator or the school district. There are, though, some reasonable alternatives that

teachers can use that are available for download from the Internet. One open source option is

called Open Sankoré. Open Sankoré was designed, initially, at the University of Luassane,

and now is supported by Webdoc SA in Lausanne and DIENA in France ("Open-Sankore,"

2013). This universal program is multi-platform and compatible with every type of interactive

hardware ("Open-Sankore," 2013). With Open Sankoré, teachers and learners can comment,

draw, and highlight text, as well as import audio, video, and flash animations ("Open-

Sankore," 2013). Furthermore, Open Sankoré has an open source code and file format. This

allows those who are willing and capable to write computer programs to modify and adapt the

program to meet their specific needs.

Software and Hardware Issues

Some technical problems have been known to hinder the implementation of IWBs in

the classroom. It has been mentioned that for some programs, the screens become blurry and

difficult to read or they are not bright enough to see (Hall & Higgins, 2005). Also, the

speakers that come with the equipment may not be loud enough for a large class to hear

(Martin, 2007). Another issue is board height. Depending on the users, the board and

projector may have to be adjusted so that the tallest and shortest users can both participate with ease (Moss et al., 2007). It has been noted that connectivity issues interrupted lessons at times, thus affecting the educator's teaching (McQuillan, Northcote, & Beamish, 2012). Furthermore, the general installation and maintenance of the IWBs must be taken into account. These machines must be de-bugged periodically, have their projector bulbs replaced, be dusted on occasion, and be generally repaired from potentially rough use by the students and educators (Hennessy & London, 2012).

Financial Costs

IWB technology brings with it a hefty financial burden on the school districts that wish to purchase it (Jones, Kervin, & McIntosh, 2011). With prices ranging between $1,000-$5,000 per individual unit Robertson & Green, 2012; ("Smarttech," 2013), schools may struggle finding the funds necessary to put IWBs into each classroom. Also, teacher training comes with a high cost in time and money. Teachers must attend training sessions in order to learn how to design, implement, and collaborate with others on how to best utilize this technology. As Türel and Johnson (2012) note, far too often are training sessions too basic and superficial for educators to gain any real experience on how to use the technology. In regards to specialized education classes like ESL, they often do not receive the latest in technology before the more mainstream classes do. Therefore, IWB technology may not be economically feasible for many school districts with lower school budgets.

Theoretical Support for IWB Classroom Usage

The Importance of "the Dialogic" as a Pedagogical Goal

Rupert Wegerif has written extensively about the importance of conducting "dialogic education" through the creation of "dialogic space" in the classroom (Wegerif, 2006, 2011). This kind of "space" is not considered physical, but a type of social interaction where individuals can collaborate on tasks, share ideas, and think collectively (Wegerif, 2006; Gillen, Littleton, Twiner, Staarman, & Mercer, 2008). This "space" offers students opportunities to develop and clarify concepts, challenge each other's opinions, and view material from the other's perspective (Wegerif, 2006). Furthermore, Wegerif states that dialogic shouldn't just be a minor goal, but rather it should be considered the highest goal of an educational system (2006).

IWBs have shown to facilitate "dialogic space" by allowing the instructor to use "scaffolding" to help direct the collaborative tasks of the students (Gillen et al., 2008). As for the students, the IWB allowed them to access needed information for the task, annotate material, modify content, and allow all members to see the screen and contribute (Gillen et al., 2008).

Exploratory Talk as a Means of Student Learning

Rupert Wegerif and Neil Mercer are two main researchers who have explored the importance of language learners engaging in what they call "Exploratory Talk" (Mercer, Fernandez, Dawes, Wegerif, & Sams, 2003; Wegerif, 2006; Wegerif, Littleton, Dawes, Mercer, & Rowe, 2004). Exploratory talk is significant in one's learning because it allows individuals to engage in sociocultural interactions, thus allowing language to be used as a tool

for creating a collective understanding of various concepts (Mercer et al., 2003). More specifically, learners must negotiate the meaning of words, challenge initial perspectives of concepts, provide alternative perspectives, and be able to come to some sort of joint understanding of an issue (2003). However, ground rules must be established for Exploratory Talk to occur. Some conditions suggested are 1) students must converse with each other in order to complete the activity, 2) the activity should facilitate cooperation, not competition among the participants, 3) the learners must understand the objectives of the task, and 4) the learners should understand why communicative dialogue is important for solving problems (2003). With the right kind of task design and pedagogical approach, IWBs have the ability to facilitate this sort of Exploratory Talk that Wegerif and Mercer believe to be so crucial to language leaners' progress (Mercer, Warwick, Kershner, & Staarman, 2010).

Benefits of Use

IWB Flexibility and Adaptability

Teachers who use IWBs have the ability produce their own material or modify existing material to fit the needs of their classroom, given that they have been properly trained to do so (Murcia, 2008; Sundberg et al., 2012). This creates greater potential for developing compelling classroom activities that may not otherwise have been available. One example of content editing is taking pre-existing articles from the Internet and annotating them by highlighting key words or phrases in order to assist students in focusing on the key lesson points (Murcia, 2008). Furthermore, YouTube and Netflix are just two out of an immense number of various sites that are accessible for supplementing classroom content.

Saving and Printing Work

Unlike traditional whiteboards or blackboards, IWBs allow the instructor to save his or her work on a daily basis, as well as print off specific notes and distribute them to the class. This is beneficial for instructors who wish to review content with their students, teach the same level from year to year, or for those who wish to share their notes with colleagues (Kennewell & Beauchamp, 2007). Educators have also mentioned the simplicity of building on lessons and activities year after year (2007).

Teacher Collaboration

Collaboration on pedagogical approaches, program design, and general trouble shooting amongst teachers has been growing in popularity and has shown to be a productive professional-development technique (DeSantis, 2012; Kennewell & Beauchamp, 2007; Türel & Johnson, 2012). By allowing teachers enough time to personally familiarize themselves with the technology, as well as through peer mentoring techniques, schools may be able to more successfully implement the use of IWBs in their classrooms.

Multimedia/Multisensory/Multimodal Presentation to Emphasize Differentiated Learning

IWBs integrate numerous technologies into one technology station in the classroom. Instructors and students are able to browse the Internet, play CDs, present slideshows, and incorporate tactile computer programs into their language learning lessons (Hall & Higgins, 2005). The diversity of different tasks allow for multiple intelligences to be cued, and thus possibly create a more effective learning environment for the language learners (Deaney, Chapman, & Hennessy, 2009; Gillen et al., 2008; McQuillan et al., 2012; Murcia, 2008;

Terreni, 2010; Türel, 2011). For lower level learners who are not literate yet, the visual aspect

of IWBs may allow for unique opportunities to see numerous picture examples of vocabulary

that they may not be aware of. For those who are kinesthetic learners, the "hands on" nature

of IWBs allows a degree of physical interactivity not available through traditional

whiteboards and blackboards (Whitby, Leininger, & Grillo, 2012). Students are able to easily

move and manipulate objects on the board in order to complete classroom tasks. One

classroom example comes from a science class where students work in groups to show the

effects of heat on dissolving sugar particles. The students were able to manipulate the

particles on the board to show the physical breakdown of the molecule (Murcia, 2008).

Interactivity and Participation

It has been theorized that the usage of IWBs in the classroom would promote more

interactivity and participation amongst the students (Kennewell, Tanner, Jones, &

Beauchamp, 2007). While working in groups up at the IWB, students must negotiate terms,

explain rationale, and discuss key concepts to complete the given tasks (Murcia, 2008).

However, some researchers of the technology have noted that the interactivity has been more

whole-class focused rather than small group focused (Kennewell, Tanner, et al., 2007; Whitby

et al., 2012). This has been met with both positive and negative reactions from teachers

(Shenton & Pagett, 2007). Furthermore, the higher levels of participation from the students

may be credited to the novelty of using a new technology in the classroom, and may not have

sustainable interest for the students. As some surveys have shown, student motivation is much

higher when the students are working with the IWBs (Mercer et al., 2010). However, IWBs

have not necessarily been around long enough for researchers to know whether or not student

interest fades over time. It has been predicted that when IWBs become utilized more frequently in the classroom, novelty will wear off and students' motivation and participation may trickle off (Shen & Chuang, 2010).

Changing Dynamics of ESL Classrooms

Matching Students' Digital Culture

We are presently living in a highly computerized age where much of our daily routines and social interactions are mediated by digital technology. Compared with educational classrooms from half a century ago, today's classroom technology is vastly different (Blue & Tirotta, 2011). As Prensky notes, the learners of today are growing up in a digital environment quite different from that of their educators (2001). Prensky argues that because of these differences, the traditional approaches of teaching may not be effective anymore. Instead, educators must develop new pedagogical approaches that will be relevant and stimulating for the coming generation of learners (2001). Furthermore, one of the responsibilities of an educational system is to adequately prepare students for their future careers and occupations. By using IWBs, schools allow students more opportunities to utilize multimedia computer technology, produce digital content, and collaborate with peers to accomplish specific tasks. This may then build student and teacher familiarity and comfortability with the technology and diminish personal anxiety about using it (Blue & Tirotta, 2011).

Taking an opposing side to this argument, Cuban suggests that if students are not exposed to different types of technology at a young age, they may still become technologically savvy (2001, pp. 61-62). Therefore, creating a technologically rich

environment for students at a young age may not be all that beneficial for their growth and development. Furthermore, allowing young learners to become too entrenched using technology might actually be detrimental to their developing of other skills such as learning to use the five senses, focusing, and thinking logically (p. 60). This possible consequence may then have a negative impact on the students' learning later in life.

Students' Reactions to IWB Classroom Use

Surveys have shown that many students positively respond to the use of IWBs in the classroom (Hui Ling & Moloney, 2011; Matthews-Aydinli & Elaziz, 2010, McQuillan et al., 2012; Türel & Johnson, 2012). Students have noted the importance of interpersonal interaction and participation, as well as personal engagement and elevated levels of motivation (Hui Ling & Moloney, 2011). As students became more familiar with the IWB technology, their opinions tended to become more positive (Matthews-Aydinli & Elaziz, 2010). However, some students noted technical issues that impeded their learning like IWB "freezing" and "crashing," as well as the need to properly calibrate/recalibrate the touch-screen (Hall & Higgins, 2005).

Students' and Teachers' Changing Roles

With changing technology in the classroom, teachers' roles and students' roles are apt to change as well. One study showed how using IWBs positioned the teachers in more of a "coaching" role where they acted as facilitators and guides of learning rather than distributors of content knowledge (Tsung-Ho, Yueh-Min, & Chin-Chung, 2012). The students' took more of a heuristic role where they collaborated and cooperated with their classmates in order to construct their own understanding of the content knowledge (2012). As Hall and Higgins

(2005) point out, issues of "power, status, and control" come into question when establishing a pedagogical approach. While students are taking on more responsibilities in directing their own learning, it is important for educators to create a safe, nurturing environment for the students to learn, grow, and discover (2005).

In a contrasting opinion, Cuban makes the argument that educators are typically slow to adopt a new technology into their classroom. However, when they do, the technology usually sustains a type of teaching methodology already in place rather than radically altering the teacher's established pedagogical practices (2001, p. 65). Therefore, instead of rapidly changing revolution in the teaching practices of educators, there is more of a slow evolution of teaching styles and approaches (2001, p. 152).

Pedagogical Concerns for Using IWBs

Although IWBs have shown to be a powerful and stimulating teaching tool in the classroom, there have been some noteworthy constraints and limitations that come with using it (Hall & Higgins, 2005). Some of these constraints and limitations may be avoided or minimized, while others will simply become a necessary part of IWB utilization.

Lower Level Thinking, Limited Verbal Interaction, and Student Passivity

Those who have been critical of IWBs mention how it may tend to promote lower level thinking skills of the students (Burns & Myhill, 2004; Hennessy & London, 2012; Kennewell et al., 2007). Instead of encouraging students to think critically and deeply on a particular subject, teachers using this technology may tend to simplify their questions, and, in return, receive simplified answers (Gillen, Staarman, Littleton, Mercer, & Twiner, 2007; Hennessy & London, 2012). There has also been mention of how students do not engage with

one another in more than two or three word utterances when using IWBs (Coyleet al., 2010).

As a result, the IWBs, ironically, may limit interaction between students, and thus undermine

the purpose of using the technology. Also, it has been mentioned that IWBs may create more

learner passivity in the classroom, thus leading to a more transmission style, teacher-centered

instruction (Burns & Myhill, 2004; Gillen et al., 2007; Goodison, 2003; Hennessy & London,

2012).

Increased Pace of Teaching

Because of the IWB's speed and convenience in its ability to conjure images from the

Internet or manipulate content on the board, the pace of the teaching may be increased (Gillen

et al., 2007). The increase in pace may also be employed as a teaching tactic to keep

classroom behavior positive (Moss et al., 2007). However, the increase in pace may have a

detrimental effect on the students' learning. Students may lack ample opportunities to ask

questions on the content (Burns & Myhill, 2004; Moss et al., 2007), or engage in meaningful

dialogue with their peers (Gillen et al., 2007). Furthermore, in an attempt to engage all of the

learners in an interactive activity, there may be more of an emphasis on rapid-fire questions

that do not require much mental effort (Burns & Myhill, 2004).

Teacher Coercion to Implement Technology into their Classroom

It has been noted by Schmid and Whyte (2012) that many teachers in the West are

being coerced into adopting IWBs into their classroom and, by doing so, changing their

pedagogical approaches in order to more effectively use this technology. For many of the

younger teachers coming into the field, this may not be much of a conflict. However, for more

established teachers that may have become comfortable with their traditional pedagogical

approaches such as teacher-centered lecture and grammar-translation, this new technological change in the classroom may cause some conflict (DeSantis, 2012; Schmid & Whyte, 2012). Many teachers lack training with IWBs and, consequently, feel at a loss on how to implement them into their classrooms (Hennessy & London, 2012; Schmid & Whyte, 2012).

Lack of Teacher Training

Teacher training is a key element to successfully implementing a new technology in school classrooms. Despite its multimodal functions and new capabilities, many educators still only use the most basic functions of an IWB, such as playing videos and presenting PowerPoint presentations (Türel & Johnson, 2012). These activities are educationally adequate in their own right, but may be performed without purchasing such an expensive piece of equipment. Furthermore, many teacher training workshops last for only 1 day and are held only a few times during the school year. After these workshops, teachers who wish to implement the technology more into their classrooms may struggle with designing appropriate tasks for their students due to the lack of technology support (DeSantis, 2012). As mentioned earlier, student motivation tends to increase when using IWBs. However, one survey study showed that when instructors failed to develop patterns and routines with the IWB, the students' motivation tended to wane and that most of them did not see the technology as beneficial to their learning (Schmid & Whyte, 2012). What has been suggested is that more teacher training and familiarity with IWBs is necessary for successful classroom utilization (Aydinli & El Aziz, 2010; Blue & Tirotta, 2011; DeSantis, 2012; Türel, 2011; Türel & Johnson, 2012; Whitby et al., 2012).

Developing IWB Teacher Proficiency Takes Time

Teachers must be given time to develop their skills in using IWBs and integrating them into their pedagogy (Hennessy & London, 2012). A study conducted in 2007 showed that it took roughly two years for educators to feel confident and experienced in using IWBs (Somekh, 2007). As Wright (2010) notes, the more complicated and sophisticated a technology becomes, the more time is required by the user to understand it, be trained with it, and develop one's skills. Therefore, schools must invest in teacher training and professional development in regards to IWB technology.

Literature Review Summary

As we have seen, the implementation of IWBs in the classroom has raised a number of different technical and pedagogical questions that are yet to be resolved. Furthermore, the responses to its use from both students and educators have been somewhat mixed, though very positive overall. By conducting more interviews from a number of different teachers within a local context, we may be able to better assess the needs of implementing IWBs in our ESL classrooms by increasing general awareness of the issues at hand.

Chapter III: Research Questions

The research questions for this study are:

1. What are ESL instructors' opinions and attitudes on using interactive whiteboard technology in their classrooms?

2. Do ESL instructors feel they have received adequate training in regards to using interactive whiteboards in their classrooms?

3. What are the affordances and constraints that interactive whiteboards offer in an ESL classroom as perceived by the participants?

Chapter IV: Methodology

The design of this interview study followed the seven stages of interview inquiry outlined by Kvale and Brinkmann (2009). These stages include thematizing, designing, interviewing, transcribing, analyzing, verifying, and reporting. The thematizing stage, which describes the purpose of the study, has already been covered through the introduction, literature review, and research questions.

Participants

The participants for the study were four K-12 ESL instructors who work in the same school district in an upper Midwest state. ESL instructors from other school districts were invited to participate in this study, but they did not reply to the invitation. The four willing participants varied in teaching experience as well as grade level instruction. Some instructors worked with very young learners in the new-to-country English language program (grades K-5), while others worked in middle schools (grades 6-8) and high schools (grades 9-12). Also, the instructors had varying levels of experience using the IWB technology in the classroom. Two instructors, Joan and Katie, had used the IWB technology extensively for three to four years, while the other two, Lisa and Mary, had used it far less extensively for one to two years. One instructor had completed a Master's degree, while the other three had completed their Bachelor's degrees. Three out of the four participants spoke more than one language, and all spoke English as their first language. One male and three female participants were used in this study. The ages of the instructors varied from those in their late-twenties to late-thirties.

The participants were contacted through multiple available means. First, the school

districts were contacted to request information about the proper protocol for contacting

instructors about this topic. The school districts' offices put me into contact with the English

Language Coordinator who then gave me the email addresses of the ESL instructors of the

district that use IWBs in their classroom. I then emailed these instructors to request an

opportunity to interview them about their usage of IWBs in an ESL classroom. They agreed to

be interviewed, and we set up a time to meet. The times for the interviews took place after the

school had finished. The location was at the school where the participants work or at a

meeting place they preferred.

To protect the privacy of the participants of this study, each participant was randomly

given a pseudonym. This measure was to minimize the risk of any sort of scrutiny the

participant could face because of his or her beliefs or opinions about the use of IWB

technology in their classroom. As a result, the participants may have felt freer to express their

personal views about the topics.

Materials Needed

The materials needed to conduct this project included fifteen interview questions. The

participants answered thirteen layered semi-structured questions and two open-ended

questions. These questions were theoretically based on the topics covered in the literature

review and linguistically modeled after the examples given by both Kvale and Brinkmann

(2009) and Varghese and Johnston (2007). The first question (Q1) was an open-ended

introductory question that asked the participant to give their best example of using an

interactive whiteboard in his or her classroom. This question has the potential to answer RQ1

and RQ3, but may have simply given insight as to how the instructor perceives he or she

utilizes the IWB technology. Four of the interview questions (Q7, Q12, Q13, and Q14) were

designed to answer Research Question 1. These questions revolve around the instructors'

opinions and attitudes about the use of the technology in their classroom.

Table 1

Research Question 1 with Related Interview Questions

Table 1. Research Question 1: What are ESL instructors' opinions and attitudes on using interactive whiteboard technology in their classrooms?
Interview Question 1: To start, please describe your best example of using an interactive whiteboard in your ESL classroom. Please explain in detail.
Interview Question 7: In your personal opinion, what do you think the general role of interactive whiteboards should be in the ESL classroom? Please explain your answer in detail.
Interview Question 12: What do you think your reaction would be if, for whatever reason, you weren't able to use interactive whiteboards in your classroom for an entire school year? Please explain your answer in detail.
Interview Question 13: In your opinion, how do you think the use of interactive whiteboards has influenced your teaching strategies? Please explain your answer in detail.
Interview Question 14: What suggestions would you give school districts that are thinking of implementing interactive whiteboard technology into their classrooms in the near future? Please explain your answer in detail.

Three of the interview questions (Q2, Q8, and Q10) were designed to answer Research

Question 2. These questions deal with the adequacy of training the instructors have received

regarding their use of IWBs in their classroom.

Table 2

Research Question 2 with Related Interview Questions

Table 2. Research Question 2: Do ESL instructors feel they have received adequate training in regards to using interactive whiteboards in their classrooms?
Interview Question 2: Please describe any formal or informal training you have received on the use of interactive whiteboards. Please explain in detail.
Interview Question 8: Do you feel the training you have received for using the interactive whiteboard adequately prepared you for implementing the technology in your classroom? Explain your answer in detail.
Interview Question 10: What changes, if any, would you make to the interactive whiteboard training program at your school? Explain your answer in detail.

Seven of the interview questions (Q3, Q4, Q5, Q6, Q9, Q11, and Q14) were designed to answer Research Question 3. These questions attempt to delve into the affordances and constraints perceived by the instructors.

Table 3

Research Question 3 with Related Interview Questions

Table 3. Research Question 3: What are the affordances and constraints that interactive whiteboards offer in an ESL classroom as perceived by the participants?
Interview Question 1: To start, please describe your best example of using an interactive whiteboard in your ESL classroom. Please explain in detail
Interview Question 3: Could you describe a time when you produced material or modified material for the interactive whiteboard in order to fit the needs of your classroom? Please explain your answer in detail.
Interview Question 4: Could you tell me about a small group activity in which ESL students effectively used the interactive whiteboard? Please explain your answer in detail.
Interview Question 5: What do you feel are the main benefits of using interactive whiteboards in an ESL classroom? Please explain your answer in detail.
Interview Question 6: What do you feel are the main drawbacks of using interactive whiteboards in an ESL classroom? Please explain your answer in detail.
Interview Question 9: How differently, if at all, do you think your students respond when an activity uses an interactive whiteboard compared to an activity that does not use it? Please explain your answer in detail.
Interview Question 11: Could you please describe a time when your students were able to engage with one another in order to accomplish a task using the interactive whiteboard? Please explain your answer in detail.
Interview Question 14: What suggestions would you give school districts that are thinking of implementing interactive whiteboard technology into their classrooms in the near future?

Finally, the last question (Q15) was open-ended, allowing the instructors to discuss any other kind of feeling or attitude he or she may have towards the use of the IWB technology.

Table 4

Interview Question 15

Do you have anything else you would like to mention about the use and implementation of interactive whiteboards in an ESL classroom?

The difference in the number of each type of question reflects the emphasis of what this interview study was focusing on. Finally, follow-up questions were asked in order to get more depth or clarification on the main question asked.

Interview Protocol and Audio Transcription

The interviews were conducted face-to-face at the participants' schools or places of preference. The face-to-face interviews took between fifteen and fifty-five minutes. The interviews were recorded using a digital voice recorder. I, the interviewer, took notes and asked follow-up questions to clarify responses if needed. The audio files and word documents were saved on the file/web space provided by St. Cloud State University. The audio files from the interviews were fully transcribed by using an online transcription program called Transcribe ("Transcribe", 2015).

In order to ensure that the transcription of the interviews reflected the opinions and attitudes of the participants, I conducted member checks; I mailed each participant a copy of their interview transcription and allowed them the opportunity to verify its accuracy. This type of respondent validation has been present in at least one other interview study conducted

by Varghese and Johnston (2007), and it has been considered an essential strategy for bolstering research credibility (Shenton, 2004).

Data Analysis

After the transcriptions of the interviews were completed, the responses to each individual question were compiled using Microsoft Word. This program allowed the participants' responses to each question to be juxtaposed with one another. Then, by conducting a word search throughout the different responses and by paraphrasing larger chunks of text, I was able to see the frequency of specific key terms mentioned and note the main themes discussed by the participants (Mackey & Gass, 2005). These themes were then color-coded for organizational purposes. For each question, the coded themes were tallied and arranged on an Excel document from most frequently mentioned to least frequently mentioned. From here, I was able to tentatively assign central categories which all of the themes would somehow be related to (Strauss & Corbin, 1998). This gave a clearer understanding as to which themes are most significant to the participants in the study. After establishing the different themes and their magnitude of significance, I was able to elaborate further on their responses, giving a more detailed and nuanced explanation for their opinions (Mackey & Gass, 2005).

Chapter V: Results

This section reports the frequency of each category mentioned during the interviews. With the exception of the "Training" category, which has a higher frequency due to the fact that I explicitly asked the participants about it, the other categories are simply what the participants mentioned on their own. As we can see below, the category of "Student Enthusiasm" is mentioned nine different times throughout the four interviews, while "Developing Student Vocabulary" and "Accommodating Different Learning Styles" are mentioned five times. The next most frequent categories, mentioned four separate times during the interviews, are "IWBs as an Assistive Tool," "Students' Hands-On Opportunities," and "Student to Student Peer Feedback." The category of "Technical Glitches" and "Teacher Want for IWBs" are mentioned three separate times, with the remaining categories being mentioned only once or twice.

Table 5

All Categories Ranked by Frequency

Categories	Times Mentioned by Participants
Training	20
Student Enthusiasm	9
Developing Student Vocabulary	5
Accommodating Different Styles of Student Learning	5
Viewed as an assistive tool	4
Students' "hands-on" opportunities	4
Student to Student Peer feedback	4
Teacher Want for IWBs	3
Tech Glitches	3
Saving Material	2
Student Collaboration	2
Collaborate with Colleagues	2
Pool Resources	2
Teacher Creativity	2
Re-adjusting to Teaching Without IWBs	2
Babysitter Function	1
Prepping for Substitute Teachers	1
Cost Efficient for Educator	1
Ambivalence to Technology Overuse by Students	1

Looking at the wide variety of categories, I decided to place them into seven different groups in order to gain a better understanding as to what the ESL instructors felt were most relevant to using IWBs. The groups are *Training, Fondness for Technology, Usage in the Classroom, Collaboration with Colleagues, Potential Problems with Technology, A Helpful Assistant,* and *Outliers.* Below are the different groupings:

Table 6

Training

Categories	Times Mentioned by Participants
Training	20

One of the reasons *Training* received its own grouping is due to the fact that I specifically asked the participants to discuss personal issues of training. Consequently, when analyzing the transcripts, *Training* was much more frequently mentioned than the other categories. Therefore, in order to portray an accurate description of the participants' responses, I have decided to separate this category from the rest of the groups.

Table 7

Fondness for IWBs

Categories	Times Mentioned by Participants
Student Enthusiasm	9
Teacher Want for IWBs	3

These categories were grouped together because they both represent the personally affinity the participants have towards the use of IWBs, and the participants' perceptions as to how they believe the children feel about IWBs in the classroom.

Table 8

Usage in the Classroom

Categories	Times Mentioned by Participants
Developing Student Vocabulary	5
Accommodating Different Styles of Student Learning	5
Viewed as an Assistive Tool	4
Students' "Hands-On" Opportunities	4
Student to Student Peer Feedback	4
Teacher Creativity	2
Saving Material	2
Student Collaboration	2

These categories were all grouped together because they all relate to the participants' perceptions as to how the IWBs function in their classrooms. By viewing the chart, we see that student vocabulary development is a key function of IWBs in the classroom, along with the benefits of reaching students with differentiated styles of learning.

Table 9

Collaboration with Colleagues

Categories	Times Mentioned by Participants
Collaborate with Colleagues	2
Pool Resources	2

These two categories were grouped together due to the sharing aspects amongst colleagues. This kind of sharing may take place with instructors working in the same building, or it could occur throughout the district, or even statewide.

Table 10

Potential Problems with Technology

Categories	Times Mentioned by Participants
Technology Glitches	3
Re-adjusting to teaching without IWBs	2

These two categories have been grouped together because they both relate to what teachers do when the IWB in their classroom is unavailable. The category of technology "Technology Glitches" obviously deals with unexpected unavailability, while the "Re-adjusting to Teaching without IWBs" allows the participant to plan ahead of time.

Table 11

A Helpful Assistant

Categories	Times Mentioned by Participants
Babysitter Function	1
Prepping for Substitute Teachers	1

This group revolves around how IWBs supports ESL instructors when they are not directly using it themselves. For example, the category of "Babysitter Function" refers to when instructors are moving around the room, helping students in stations, and they can see from a distance whether the students working on the IWB are on task or not. The category of "Prepping for Substitute Teachers" refers to the ESL instructor preparing lesson plans, activities, and presentations in order to help the substitute teacher conduct class in their stead.

Table 12

Outliers

Categories	Times Mentioned by Participants
Cost Efficient for Educator	1
Ambivalence to technology overuse by students	1

The last two categories are grouped together because they do not seem to belong to any other group, and the participants only mentioned them once each during the interview.

Summary of Results

This sub-section summarizes the results of the thematic categorization in relation to answering the study's research questions while also giving possible explanations as to why the participants answered as they did.

1. What are ESL instructors' opinions and attitudes on using interactive whiteboard technology in their classrooms?

In general, the instructors interviewed for this study viewed IWBs as being a teaching tool that assists their pedagogical approaches in teaching ESL. Two instructors interviewed, Joan and Katie, seemed to be more enthusiastic about the IWB's potential than the other two

interviewed. From Joan's and Katie's responses, a possible reason for the difference in opinion may be due to the difference in the amount of usage of the instructors. Those that use the technology more have invested more time in understanding its capabilities and thus believe it can be much more beneficial to their teaching practices. Joan stated,

> Um, well I use it everyday with my students. I use it all day long. I start off my day with my students using it as a, um, kind of fancy whiteboard where I can keep all of my messages and lessons printed on, ready to be used, including access to links, and what not. So I always have my morning message on there as far as what my students should expect throughout the day. And then periodically use it throughout the day for games and songs, access to YouTube videos, um, as well other videos and links that I have been accustomed to using like BrainPop ESL, um, and so, um, along with that having access to what's called Smart Notebook […]

Joan mentioned that she has used an IWB for 3 years and hopes to continue using it in the future.

In contrast, the instructors that do not use IWBs frequently in their teaching, Lisa and Mary, seem to be interested in using just the basic functions of the technology. This is probably due to the fact that they since they use it sparingly throughout the course of their day, they do not need to invest much time into maximizing more of the technology's potential. As Lisa noted, "Well, how I use my whiteboards, um, is mostly for like games with the kids and, um, just whatever subject we were having or studying […] I just use it for that normally."

In regards to the *Fondness for IWBs* category, Joan, Katie, and Lisa mentioned three times total that they would like to see an IWB in their classroom. When discussing their perceptions of how their students view activities with IWBs, the participants mentioned how enthusiastic the students become. The participants noted a higher level of student enthusiasm and student involvement when they, the instructors, use IWBs in their activities. Lisa stated,

"And, um, they are the kids are just really engrossed in the lesson, and so ah, I think, well, I would really like to use more of the Smart Notebook[…]" Mary, too, mentioned how enthusiastic the students become, stating, "I also think the kids get really excited about it. So I mean any technology they get excited about could be a good way to keep engagement up so using it to get them up and trying it themselves."

2. Do ESL instructors feel they have received adequate training in regards to using interactive whiteboards in their classrooms?

The participants in the study did not feel they had received adequate training. They all seemed to agree that they would like more training when it comes to using IWBs. Lisa mentioned, "Um, I guess, maybe offer, like, training for newbies and people that use it every day. Like here's some other tricks you can try." From what the participants mentioned, the IWB training they had received dealt mainly with basic functions of the technology, such as how to turn the machine on, and how to orient the screen correctly so the stylus pen will mark the desired area. The participants were then expected to learn how to use the technology on their own or seek out assistance from peers and colleagues who have had more experience. Lisa mentioned,

> I just kind of googled Smart Notebook and so it was five minutes with [training personnel]. My coworker showed me how you have to, um, I don't know the right word, but you have to kind of like reconfigure the Smart Notebook, or the whiteboard, and yeah, just watching a tutorial and doing it. It's mostly how I learned.

Joan suggested that she would like to see schools put on multiple workshops that cater to different levels of experience of the teachers. She mentioned,

> Um, and so I can see a survey going out. 'How much experience do you have using this?' And maybe even requiring, ok, 'Well, we are offering right now three different courses: beginner, intermediate, and advanced course in whiteboards and you are

required to take one as you enter.' And then periodically offer that through staff development so that you can constantly fine tune and grow your skills.

So, according to Joan, for teachers who have no experience using IWBs, they should receive the basic information on how to use an IWB, as well as focus on developing user skills in regards to finding and modifying resources for the classroom. For those who identify as intermediate-to-advanced users, the workshop should offer an opportunity to design and create more activities, as well as offer an opportunity to fine-tune their abilities and discuss classroom implementation with their colleagues.

Another suggestion, made by Mary, was to have a simple "cheat sheet" for beginners to follow when they are struggling to find resources or modify material. Mary noted that much stress and frustration could be avoided if there was just a simple way of looking up information on the best ways of creating and modifying materials for a specific type of activity.

3. What are the affordances and constraints that interactive whiteboards offer ESL classrooms as perceived by the participants?

According to the category *Fondness for IWBs*, one of the biggest benefits of using the IWBs in the classroom is that it tends to have a motivating effect on the students. According to the participants, students seem to be more excited and engaged with the lessons if the instructor is able to incorporate IWB. As Lisa stated, "[…]this is just a really cool tool that gets everyone engaged and, um, and it seems to be working for most kids and it gets their attention." As a consequence, students who are motivated to participate in the lesson have a much higher tendency of retaining the content being taught to them, and therefore may show more signs of improvement in their language learning. Interestingly, one drawback of using

IWBs is that the student may be too interested in what is happening on the board and not

paying attention to the work they should be tending to. Joan noted,

> They are constantly enthralled, which is why I have a hard time using it in a small group setting when there is something else going on in the classroom because, whenever it's on, whenever it's being used, they want, they naturally drive towards it.

These issues of student distraction can pose a problem for some educators. However, it seems

with the right kind of planning, as well as knowing the students' abilities to focus on their

own work, this issue may be easily overcome.

The participants in this study tend to want to have IWB technology in their classroom.

However, two out of the four participants mentioned that they will have to do without IWBs

in the coming year due to their own special circumstances of moving to a different school,

and, interestingly, the two that will continue having access to IWBs stated that they would

feel indifferent if they did not have IWBs in their classroom. For the two participants moving

to a new school, these circumstances pose a challenge to the instructors since they will have to

adapt their teaching approach to classrooms that do not have IWBs, but rather some other

forms of technology. One participant mentioned that she would petition her superiors to

acquire an IWB for her classroom at her new school.

In regards to the category *Usage in the Classroom*, Joan, Katie, and Mary explicitly

stated that they saw the IWB as merely a tool to be utilized in the classroom. Lisa seemed to

imply that she uses it as an extension of her pedagogical approach. As Katie noted when

asked how she saw the IWB, she stated, "Just another tool. Just like a book or the teacher or

the computer or whatever. It could be anything that you are using in the classroom." This

perception is significant because it shows the teacher's belief that technology is not driving the class, but rather supplementing the lessons.

Another benefit IWBs offer are the different ways instructors can modify their content to meet the different learning styles of the students. By using IWBs, instructors are able to incorporate visual, audio, and kinesthetic elements into their lessons. For example, Lisa mentioned, "And I just love how, with the whiteboards, it's a good way to learn language when you're hearing it. So you're listening, speaking, reading, and writing. You can do all of that on the [IWB]." Multimodal learning is especially important for low-level ESL learners since many of them have difficulty with oral reception and production. By using IWBs, the instructors may be able to incorporate both a visual and kinesthetic element in order to help the students grasp key concepts of the content. Joan noted how IWBs may help students who have writing difficulties, stating,

> […] it also gives the students an opportunity to interact with the language on a different level where they're arranging pictures, where they're doing sorts, we're talking about short vowels and long vowels, and we've got a list of words and they can just easily move the word instead of rewriting the word, instead of copying it down into their notebook, any student that struggles with fine motor skills has that exposure where they can just move it with their hands, and the kids really seem to excel and adapt to that.

One area of language learning for which IWBs seem to really be helpful, according to the participants, is that of learning vocabulary. The IWBs, when connected to the Internet, allow instructors to call up a number of different pictures and concepts very quickly from websites like Google Image. There is a limited amount of lag time between student inquiry on a key term and possibly numerous accurate representations of that term. Joan noted,

Access to the world at your fingertips. Um, I mean any time my students are struggling with concepts, I, you have Google images. Anything that they can't quite understand can be put right on there. Um, there is a whole world of resources out there as well that are really geared towards second language learners.

IWBs also allow opportunities for students to give peer feedback during activities. Students are able to display sentences they have written up on the board, and the other students will be able to critique its positive and negative aspects. Working with math problems is also very similar. As Joan mentioned,

[…] so giving that instant feedback, using the smart board in some other form of tool like a whiteboard or an iPad, um, and then using that in a small group setting where they're each giving each other feedback. They're not just getting it from me. I think it's really beneficial for all learners.

By having the students critique each other's work, the instructor is not only letting the student who produced the work learn from his or her mistakes, but also the other students are able to benefit by having their awareness of the issue raised.

Another added benefit of using IWBs mentioned was the ability to collaborate with colleagues and pool resources. Often times, teachers will have their content overlap with another or just simply share similar teaching assignments. By creating lessons plans using IWBs, the teachers are able to save their work and share it with their colleagues. This ability to pool resources allows teachers to save time and energy when developing their lesson plans. As Joan noted, she would like to see more sharing of resources in her building, in her district, and even in the state.

The type of problems found in *Technical Glitches* show that the IWB technology can fail on occasion. Some issues that the teachers mentioned were burned out light bulbs on the projector, which prohibit the students seeing the activity on the screen, and issues with the

server crashing. As Joan stated, "Sometimes, the use of technology, it's great when it works. But if the server goes down, then my lessons are unavailable." However, Joan did state that issues like these happen fairly infrequently.

Another affordance mentioned is how IWBs can act as a type of assistant. Katie mentioned how she can prepare all of the day's activities for the substitute teacher. This allows for a more seamless transition from teacher to substitute. Often times when substitutes are needed in the classroom, the primary teacher does not wish to move forward in the content since he or she may feel that the topics could get off course. Therefore, days that require substitutes often focus on the review of material or the addition of supplementary content. However, because IWBs may provide the teacher with the ability to prepare a lesson in more detail by loading up relevant videos, preparing student activities, and even making a video of him or herself giving instructions to the students, the students may be able to delve into new content when they have a substitute. As Katie mentioned,

> So, now, like, when I have a substitute teacher, the substitute doesn't have to do anything. The kids know where everything is on the board, well not on the board because it's just a board, but they can go to computers and sign on and then they bring up my website and whatever tools we're going to use for the day because my website will tell them.

The IWB may also act a kind of babysitter for a group a students. Katie gives an example of the students working in stations. By having a group of students work on such a large screen, the teacher is easily able to see whether or not the students are on task. As Katie stated,

> It's like a giant notebook up there. So I can see, yeah, they're working, and I can walk away and work with these other kids. If I could do that in this room, if I had a whiteboard, that would be one more area, one more station, where I wouldn't necessarily have to go 'are they messing around?' You know. Can I help? What are

> they doing? Are they on task? Especially when you come with lower level students where there not, even when they're conversing about what they're doing, it's in their language. So you're sitting there, thinking, "are they talking about school or are they talking about soccer? What's going on here?" Um, and you never know what's going on, where with the whiteboard you can just see it. It just adds another element to a good classroom that's helpful. Another babysitter, almost.

This function of the IWB helps the instructor be more flexible in how he or she focuses his or her attention. Being able to see one group's progress and behavior from across the room helps alleviate some of the stress managing a classroom with high student-teacher ratios.

IWBs can also be cost efficient for the instructor. Teachers are well known for spending their own money on supplies for their students. This may include flashcards, music CDs, or children's stories. With IWBs, many of these costs can be reduced due to the plethora of resources on the Internet. As Lisa noted, "So, what's really cool, I didn't have to buy any CDs, no DVDs, no videos. I can just Google whatever topic we're on and just fine a fabulous song on YouTube and, um, it's just, it's kind of easy." This, along with the ability to save and pool resources, all helps with minimizing the teacher's financial burden over the course of the school year.

To end, Lisa noted how she was concerned by how much technology the students are exposed to throughout the course of their days. It is common for many students in the United States to watch hours of television every day, along with playing video games, browsing the Internet, and listening to music. By implementing IWBs in the classroom, the students may continuously use computer technology throughout the course of their day. Lisa's worry is that the students' overuse of technology may have negative social and psychological effects that we, as a society, are not fully aware of. Lisa states, "…sometimes I think...I don't know...is this good? Just getting everything on a computer." Though Prensky (2001) stresses the

importance of schools staying technologically current in order to keep students motivated and

the classroom content relevant, there may be a number of other concerns teachers have about

the attachment of their students to computer technology, which may prove distractive, and

consequently detrimental, to the students' learning.

Chapter VI: Discussion

The responses of the four participants suggest that the use of IWBs have a noticeable motivating effect on students. This affirms Hui Ling's (Hui Ling & Moloney, 2011) assertion that the use of IWBs positively influences student engagement and increases motivation. This effect, in turn, supports Prensky's (2001) argument that educational institutions should make efforts to keep up-to-date with the students' digital culture in order to remain connected and pertinent to the students' daily lives. Interestingly, though, the four participants interviewed for this study mentioned that they see the IWB technology as merely a tool to help accomplish the learning objectives of the lesson. The participants' examples of use, such as learning new vocabulary words, singing songs, or doing station work, show that IWBs make many of the activities more streamlined and efficient. From their responses, IWBs do not seem to have had a drastic change on the participants' pedagogical approaches, but rather the IWB technology creates a kind of novelty for the students while reinforcing the already established teaching strategies of the educator.

Similar to Sundberg et al. (2012) and Murcia (2008), three out of the four participants view IWBs as being versatile and adaptable. By being able to make and modify materials for the students, the instructors are able to tailor the lesson content to meet the needs of their classrooms. The instructors illustrated this sort of feature when they described how they could highlight key text, make notes in the margins, and develop their own activities using programs such as Smart Notebook and Quizlet.

Katie, Lisa, and Mary tended to use IWBs as part of whole-class activities and small group activities. The small group activities usually involved having the students go to stations

in class, with one of the stations being on the IWB. However, as Joan noted previously, IWBs can be too interesting for the students that it becomes a distraction. Therefore, Joan stated that she typically uses IWBs for only whole-class activities. This is in agreement with Kennewell et al.'s (2007) and Whitby et al.'s (2012) observations that IWBs are better suited for entire classrooms rather than small groups. Consequently, because of the teacher-centered nature of whole-class activities, teachers must take extra care when designing their lessons to ensure that all of their students are able to engage with target language and meet the set student learning objectives.

In regards to Wegerif's "dialogic space" (2011) and "exploratory talk" (2006), Joan and Katie mentioned peer feedback when writing sentences and presenting them up on the board. Also, as Lisa noted, when together in groups, the students are able to discuss answers and negotiate game strategies, depending on the activity. By these examples, it becomes evident that IWBs do offer students opportunities to develop and clarify concepts, challenge each other's opinions, and view material from the others' perspectives, thus accomplishing the Ellis' eighth principle of second language acquisition, creating opportunities to interact in the target language (Ellis, 2008). However, these sorts of outcomes are not dependent on the technology, but rather the technology helps facilitate this type of learning environment.

Unlike Tsung-Ho et al.'s (2012) argument that suggests IWBs help create a new kind of student-teacher dynamic where the students have a much more heuristic role in their learning, the participants in this study seemed to support Cuban's argument (2001) that the technology was more of an extension of their own established teaching style rather than a revolutionary technology that shifts the pedagogical control toward the students. Though

some of the participants mentioned more kinds of hands-on work for the students, the lessons are still designed and moderated by the educator. In essence, the lessons may be becoming more dynamic and interesting for the students but are still part of the traditional ways of teaching.

Finally, the participants' sentiments on the lack of teacher training are similar to many of the studies mentioned in the literature review (Aydinli & El Aziz, 2010; Blue & Tirotta, 2011; DeSantis, 2012; Türel, 2011; Türel & Johnson, 2012; Whitby et al., 2012). The participants in this study believe that more technology training is necessary for IWBs to be implemented effectively in the ESL classroom. It seems that for many educational institutions, expensive classroom technology is purchased, but it remains up to the instructor to familiarize him or herself with it. Similar to what Hennessy and London (2012) mentioned, Joan noted a desire for training levels for instructors wishing to incorporate IWB technology into their lessons. Proficiency with a technology takes time, so it is important for school districts to support their instructors' during their development.

Theoretical Implications

The rise of computer-assisted language learning (CALL) has grown immensely over the course of the last 30 years (Levy & Stockwell, 2006, p. 1). The current prevalence of computers, either student handheld devices or IWBs, in the K-12 classroom is quite astonishing. This trend does not seem to be subsiding any time in the foreseeable future. Therefore, with an increased abundance of choice in classroom activities and types of homework assignments through the use of computer technology, educators must do their best to design classroom curricula to meet the needs the of their students to the fullest extent,

giving them opportunities to develop both their receptive and productive language skills

(Ellis, 2008). To do so successfully will require a firm understanding of both theory and

practice. In regards to the responses of this study, IWBs, amongst other functions, have

allowed the participants to modify content quickly in order to highlight, clarify, and

emphasize key information of the lesson, such as when Mary annotates different sections of a

text to clarify its meaning or when Joan accompanies new vocabulary words with an

assortment of different images to help her students visualize the concepts better. These two

examples, therefore, are indicative of the participants' firm understanding of their students'

needs and their ability to create favorable conditions to meet those needs.

Educators must also be continuously critical of their own pedagogy and of their own

resources, being aware of the affordances and the limitations of the technology they deploy in

their classrooms (Levy & Stockwell, 2006, p. 2). This is no easy task. Classroom technology

changes at a rapid pace and teachers typically have little input as to what resources they will

be given for the following school year (Cuban, 2001). Nevertheless, from this study, the

participants seemed to all have the levelheaded perspective, a perspective with which I

personally agree, that language learning technology in the classroom is simply a tool to be

utilized in order to better facilitate student learning. As Joan stated, "You use [IWBs] as a

tool. [IWBs are] not the teacher, [they are] the tool used by the teacher." Technology should

not drive the classroom lessons, but rather supplement and enhance them. If teachers have

appropriate student learning outcomes and a sound pedagogical approach as the foundation

for classroom learning already established and a working knowledge of the capabilities of the

language learning technology, then the implementation of that technology should be more intuitive (Levy & Stockwell, 2006, p. 38).

Pedagogical Implications

The participants all touched on a variety of different issues and topics during the interviews. However, the topic of better instructional training in IWB technology arose frequently amongst all of the members. The second most common topic was student enthusiasm for using the technology. These two topics seem to go hand-in-hand in the classroom. For students to remain enthusiastic and motivated when using the technology, the classroom teachers must be well prepared to find, develop, and modify stimulating activities that are relevant to the lessons' objectives. For teachers to become proficient users of IWB technology, they must first be properly trained, either by the school or on their own. If they are not, many teachers may simply rely on the basic functions of the IWB. Furthermore, if teachers are not trained on how to modify material, the material that they download and use in their classroom may not be the most relevant to the lessons' objectives. Therefore, schools should invest some of their funds into training the classroom teachers in using and developing IWB programs. However, according to Hattie (2009, pp. 223-224), the extensiveness of training and the type of training will have a significant effect on the teacher's proficiency in using the technology. Hattie states that those who had received ten or more hours of training tended to improve more in their technology proficiency than the average score of the participants prior to training. Thus, the ten or more hours of training proved beneficial. For the participants who received less than ten hours of training, they not only showed no improvement from the average participant score prior to training but actually received a lower

score (2009, pp. 223-224), meaning that the nine hours or less of technology training was actually disadvantageous to the participants' technology proficiency. It is also advised that the training takes place over the course of a few weeks or less, rather than months, in order to sustain interest, motivation, and overall positive learning effects (2009, pp. 223-224).

In regards to the type of training teachers receive, teachers must be offered multiple opportunities to learn to the technology through tutorials and "drill and practice" approaches (Hattie, 2009, pp. 223-224). This will allow the teachers learning the technology to observe someone else using it, experiment with it themselves, and then receive quality feedback. When the classroom teachers become more confident in using IWBs, they will be more willing to create, modify, and share classroom activities that will benefit students as a whole.

On an individual level, it is very important for ESL teachers to explore the potential of IWBs and try to incorporate it into the classroom lesson if it is appropriate for meeting objectives. Like stated above in the literature review and results, IWB technology has many benefits that support ESL students' learning. ESL teachers should try to take full advantage of those benefits.

In regards to a lack of technology training, if the school does not offer adequate opportunities to learn how to use the IWB technology effectively in the classroom, the ESL instructors should petition their superiors. If the school does not comply with these requests, ESL instructors should ask colleagues and experiment with the technology themselves. There are available resources, such as tutorials and literature, on the Internet and at local bookstores.

Limitations

There are a number of limitations to this type of qualitative study. First, it is difficult to know how generalizable the interview responses are due to the subjectivity of IWB use by the participants. The environment, student population, and personal character of the teacher are all unique in certain degrees for each participant (Holstein & Gubrium, 2003). The participants of the study gave their personal opinions and attitudes on IWB technology, yet there was no observation of their teaching to verify their comments. Furthermore, the limited number of participants makes it difficult to discern whether the responses are very common in ESL classrooms or idiosyncratic to just their particular cases. For this study, there were four participants. Ideally, I would have liked to work with at least ten in order to get a broader consensus about these issues.

A second limitation deals with the type of participant willing to participate in the study. All four participants generally thought that IWBs were beneficial to have in the classroom. Therefore, they may have been more willing to take time out of their day to discuss their usage with it. However, educators who dislike or are indifferent to IWBs in their classrooms may simply have chosen not to participate. As a result, the participants' interview responses might have had a positive tilt that may not accurately reflect the attitudes and opinions of other ESL educators.

Another limitation to the study is my own personal subjectivity and bias when asking the questions (Holstein & Gubrium, 2003) and analyzing the responses of the participants. Unnoticed by myself, I might have unintentionally influenced the participants' responses through body language or increased emphasis on topics through follow-up questions.

Furthermore, it is possible that each participant response may have multiple interpretations to it, depending on who is doing the analysis. Therefore, the reader of this paper must trust my personal judgment as to whether I have represented the participant accurately and drawn the appropriate conclusions.

A fourth limitation is the possibility of the participants having a social desirability bias (Dornyei, 2010). When dealing with new types of technology in the workplace, the participants may wish to think of themselves as being up-to-date. Often times, it is professionally beneficial to be considered on the cutting edge in one's field. As a result, many of the participants' responses may not have accurately reflected their actual usage of the technology in the classroom.

Finally, there might have been acquiescence bias on part of the participants, meaning that they really weren't passionate or invested in the issue of IWB usage in the classroom. Thus, they may not have had any strong positive or negative feelings about the topic, and as a result, simply responded with a careless comment (Dornyei, 2010). When conducting the interviews, the times ranged from fifteen minutes to just under fifty-five minutes, with the other two being roughly twenty-five minutes long. Because of the participants' busy schedules, the amount of thought given for each response may have varied.

Further Studies

For further studies, I would like to see a broader range of participants surveyed and interviewed in regards to their IWB usage in the classroom and their opinions about the technology. I would also like to see a comparative analysis study done in regards to teachers' attitudes toward other technologies, such as student iPads, compared with their attitudes

toward IWBs. I am curious whether other technology's affordances are more suitable for student language learning based on grade level and level of language development.

Conclusion

With more than 40% of American classrooms using IWB technology (Hennessy & London, 2012), IWBs are quickly becoming a technological staple for students and teachers around the country. For ELL students, the technology may offer many benefits and a small number of drawbacks when implemented in the classroom. In order to maximize these benefits, ESL instructors must be properly trained in finding, modifying, and developing content in order to suit the needs of their classroom objectives. Technology in K-12 classrooms has a tendency to change at a frequent rate. Therefore, schools must allocate funding towards keeping their classroom teachers up-to-date with the technology they use on a regular basis.

References

Aydinli, J., & El Aziz, F. (2010, July). Turkish students' and teachers' attitudes toward the use of interactive whiteboards I EFL classrooms. *Computer Assisted Language Learning, 23*(2), 235-252.

Blue, E., & Tirotta, R. (2011). The benefits & drawbacks of integrating Cloud Computing and interactive whiteboards in teacher preparation. *Techtrends: Linking Research & Practice to Improve Learning, 55*(3), 31-39. doi:10.1007/s11528-011-0495-7.

Burns, C., & Myhill, D. (2004). Interactive or inactive? A consideration of the nature of interaction in whole class teaching. *Cambridge Journal of Education, 34*(1), 35-49. doi:10.1080/0305764042000183115.

Coyle, Y., Yañez, L., & Verdú, M. (2010). The impact of the interactive whiteboard on the teacher and children's language use in an ESL immersion classroom. *System, 38*(4), 614-625. doi:10.1016/j.system.2010.10.002.

Cuban, L. (2001). *Oversold and underused: Computers in the classroom*. Cambridge, MA: Harvard University Press.

Deaney, R., Chapman, A., & Hennessy, S. (2009). A case-study of one teacher's use of an interactive whiteboard system to support knowledge co-construction in the history classroom. *Curriculum Journal, 20*(4), 365-387. doi:10.1080/09585170903424898.

DeSantis, J. (2012). Getting the most from your interactive whiteboard investment: Three guiding principles for designing effective professional development. *Clearing House, 85*(2), 51-55. doi:10.1080/00098655.2011.607867.

Dornyei, Z. (2010). *Questionnaires in second language research*. New York: Routledge.

Ellis, R. (2008, December). Principles of instructed second language acquisition. *CAL Digest*.

    Retrieved January 5, 2014, from http://www.cal.org/content/download/1553/16478/

    file/PrinciplesofInstructedSecondLanguageAcquisition.pdf.

Gillen, J. J., Littleton, K. K., Twiner, A. A., Staarman, J. K., & Mercer, N. N. (2008). Using

    the interactive whiteboard to resource continuity and support multimodal teaching in a

    primary science classroom. *Journal of Computer Assisted Learning, 24*(4), 348-358.

    doi: 10.1111/j.1365-2729.2007.00269.x.

Gillen, J. J., Staarman, J. K., Littleton, K., Mercer, N., & Twiner, A. (2007). A 'learning

    revolution'? Investigating pedagogic practice around interactive whiteboards in British

    primary classrooms. *Learning, Media and Technology, 32*(3). Retrieved from http://

    criticalanalysisit5533.wikispaces.com/file/view/A+learning+revolution+Investigating

    +pedagogic+practice+around+interactive+whiteboards+in+British+primary+classroo

    ms+-+2007.pdf.

Goodison, T. (2003). Integrating ICT in the classroom: A case study of two contrasting

    lessons. *British Journal of Educational Technology, 34*(5), 549-566.

Hall, I., & Higgins, S. (2005). Primary school students' perceptions of interactive

    whiteboards. *Journal of Computer Assisted Learning, 21*(2), 102-117.

    doi:10.1111/j.1365-2729.2005.00118.x.

Hattie, J. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to

    achievement*. London: New York: Routledge.

Hennessy, S., & London, L. (2012). Learning from international experiences with interactive

    whiteboards: The role of professional development in integrating the technology.

OECD Education Working Paper No. 89. Retrieved from http://search.oecd.org/
officialdocuments/publicdisplaydocumentpdf/?cote=EDU/WKP%282013%294&docL
anguage=En.

Holstein, J. A., & Gubrium, J. F. (Eds.). (2003). *Inside interviews: New lenses, new concerns*.
Thousand Oaks: Sage Publications.

Hui Ling, X., & Moloney, R. (2011). "It makes the whole learning experience better": Student
feedback on the use of the interactive whiteboard in learning Chinese at tertiary level.
Asian Social Science, 7(11), 20-34. doi:10.5539/ass.v7n11p20.

Jones, P., Kervin, L., & McIntosh, S. (2011). The interactive whiteboard: Tool and/or agent of
semiotic mediation. *Australian Journal of Language & Literacy, 34*(1), 38-60.

Kennewell, S., & Beauchamp, G. (2007). The features of interactive whiteboards and their
influence on learning. *Learning, Media & Technology, 32*(3), 227-241. doi:
10.1080/17439880701511073.

Kennewell, S. S., Tanner, H. H., Jones, S. S., & Beauchamp, G. G. (2007). Analysing the use
of interactive technology to implement interactive teaching. *Journal of Computer
Assisted Learning, 24*(1), 61-73. doi:10.1111/j.1365-2729.2007.00244.x.

Kvale, S., & Brinkmann, S. (2009). *Interviews: Learning the craft of qualitative research
interviewing* (2nd ed.). Los Angeles: Sage.

Levy, M., & Stockwell, G. (2006). *Call dimensions: Options and issues in computer-assisted
language learning*. New York, NY: Routledge.

Mackey, A., & Gass, S. M. (2005). *Second language research*. New York: Routledge.

Martin, S. (2007). Interactive whiteboards and talking books: A new approach to teaching children to write? *Literacy, 41*(1), 26-34. doi:10.1111/j.1467-9345.2007.00449.x.

Matthews-Aydinli, J., & Elaziz, F. (2010). Turkish students' and teachers' attitudes toward the use of interactive whiteboards in EFL classrooms. *Computer Assisted Language Learning, 23*(3), 235-252.

McQuillan, K., Northcote, M., & Beamish, P. (2012). What matters most when students and teachers use interactive whiteboards in mathematics classrooms? *Australian Primary Mathematics Classroom, 17*(4), 3-7.

Mercer, N., Warwick, P., Kershner, R., & Kleine Staarman, J. (2010). Can the interactive whiteboard help to provide a 'dialogic space' for children's collaborative activity? *Language and Education, 24*(5), 367-384.

Mercer, N., Fernandez, M., Dawes, L., Wegerif, R., & Sams, C. (2003). Talk about texts at the computer: using ICT to develop children's oral and literate abilities. *Reading, 37*(2), 81-89. doi:10.1111/1467-9345.3702006.

Moss, G., Jewitt, C., Levaaic, R., Armstrong, V., Cardini, A., & Castle, F. (2007). *The interactive whiteboards, pedagogy and pupil performance evaluation: An evaluation of the schools whiteboard expansion (SWE) project: London challenge*. Institute of Education, University of London. Retrieved from http://eprints.ioe.ac.uk/905/1/Moss2007whiteboardsRR816.pdf.

Murcia, K. (2008). Teaching for scientific literacy with an interactive whiteboard. *Teaching Science: The Journal of the Australian Science Teachers Association, 54*(4), 17-21.

Open Sankoré. (2013). Retrieved from http://open-sankore.org.

Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon, 9*(5) Retrieved from

    http://www.marcprensky.com/writing/Prensky%20-20Digital%20Natives,%20Digital

    %20Immigrants%20-%20Part1.pdf.

Robertson, C., & Green, T. (2012). Interactive whiteboards on the move! *Techtrends: Linking*

    Research & Practice to Improve Learning, 56(6), 15-17. doi:10.1007/s11528-012-

    0607-z.

Schmid, E., & Whyte, S. (2012). Interactive whiteboards in state school settings: Teacher

    responses to socio-constructivists hegemonies. *Language Learning & Technology,*

    16(2). Retrieved from http://llt.msu.edu/issues/june2012/cutrimschmidwhyte.pdf.

Shen, C. C., & Chuang, H. M. (2010). Exploring users' attitudes and intentions toward the

    interactive whiteboard technology environment. *International Review on Computers*

    and Software, 5(2). Retrieved from St. Cloud State Interlibrary Loan.

Shenton, A. (2004). Strategies for ensuring trustworthiness in qualitative research projects.

    Education for Information, 22, 63-75. IOS Press. Retrieved from

    http://www.crec.co.uk/docs/Trustworthypaper.pdf.

Shenton, A., & Pagett, L. (2007). From 'bored' to screen: the use of the interactive

    whiteboard for literacy in six primary classrooms in England. *Literacy, 41*(3), 129-

    136. doi:10.1111/j.1467-9345.2007.00475.x.

Smarttech. (2013). Retrieved from http://smarttech.com/Solutions/Education+Solutions/

    Products+for+education/Interactive+whiteboards+and+displays/SMART+Board+inter

    active+whiteboards.

Somekh, B., Haldane, M., Jones, K., Lewin, C., Steadman, D., Scrimshaw, P., Sing, S., Bird, K., Cummings, J., Downing, B., Stuart, T. H., Jarvis, J., Mavers, D., & Woodrow, D. (2007). *Evaluation of primary schools whiteboard expansion project-summary report: Report to the Department of Children, Schools, and Families*. Center for ICT, Pedagogy and Learning. Retrieved from http://downloads01.smarttech.com/media/research/international_research/uk/becta_executive_expansion_summary.pdf.

Strauss, A. L., & Corbin, J. M. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Thousand Oaks, California: Sage Publications, Inc. Retrieved from http://www.stiba-malang.ac.id/uploadbank/pustaka/RM/BASIC%20OF%20QUALITATIVE%20RESEARCH.pdf.

Sundberg, B., Spante, M., & Stenlund, J. (2012). Disparity in practice: diverse strategies among teachers implementing interactive whiteboards into teaching practice in two Swedish primary schools. *Learning, Media & Technology, 37*(3), 253-270. doi: 10.1080/17439884.2011.586352.

Terreni, L. (2010). Adding new possibilities for visual art education in early childhood settings: The potential of interactive whiteboards and ICT. *Australasian Journal of Early Childhood, 35*(4), 90-94.

Transcribe. (2015). Retrieved from https://transcribe.wreally.com/.

Tsung-Ho, L., Yueh-Min, H., & Chin-Chung, T. (2012). An investigation of teaching and learning interaction factors for the use of the interactive whiteboard technology. *Journal of Educational Technology & Society, 15*(4), 356-367.

Türel, Y. (2011). An interactive whiteboard student survey: Development, validity and

    reliability. *Computers & Education, 57*(4), 2441-2450. doi:10.1016/j.compedu.

    2011.07.005.

Türel, Y., & Johnson, T. E. (2012). Teachers' belief and use of interactive whiteboards for

    teaching and learning. *Journal of Educational Technology & Society, 15*(1), 381-394.

Varghese, M. M., & Johnston, B. (2007). Evangelical christians and English language

    teaching. *TESOL Quarterly, 41*(1). Retrieved from http://www.jstor.org/stable/

    40264329.

Wegerif, R. (2006). Dialogic education: what is it and why do we need it? *Education Review,*

    19(2), 58-66.

Wegerif, R. (2011). My personal responses to the School of the Dialogue of Cultures. *Journal*

    of Russian & East European Psychology, 49(2), 83-89. doi:10.2753/RPO1061-

    0405490213.

Wegerif, R., Littleton, K., Dawes, L., Mercer, N., & Rowe, D. (2004). Widening access to

    educational opportunities through teaching children how to reason together.

    Westminster Studies in Education, 27(2), 143-156.

    doi:10.1080/0140672042000277099.

Whitby, P. S., Leininger, M. L., & Grillo, K. (2012). Tips for using interactive whiteboards to

    increase participation of students with disabilities. *Teaching Exceptional Children,*

    44(6), 50-57.

Wright, D. (2010). Orchestrating the instruments: Integrating ICT in the secondary

    mathematics classroom through handheld technology networks. *Technology,*

Pedagogy, and Education, 19(2). Retrieved from http://www.ncl.ac.uk/cflat/news/

documents/924113974.pdf.

Appendix

Interview Questions

Participant's Name: _____   Referential Letter:_____

Interactive Whiteboard Interview Questions

1. To start, please describe your best example of using an interactive whiteboard in your ESL

classroom. Please explain in detail. (Q1, Q3)

Notes:

2. Please describe any formal or informal training you have received on the use of interactive

whiteboards. Please explain in detail. (RQ2)

Notes:

3. Could you describe a time when you produced material or modified material for the

interactive whiteboard in order to fit the needs of your classroom? Please explain your

answer in detail. (RQ3)

Notes:

4. Could you tell me about a small group activity in which ESL students effectively used the interactive whiteboard? Please explain your answer in detail. (RQ3)

Notes:

5. What do you feel are the main benefits of using interactive whiteboards in an ESL classroom? Please explain your answer in detail. (RQ3)

Notes:

6. What do you feel are the main drawbacks of using interactive whiteboards in an ESL classroom? Please explain your answer in detail. (RQ3)

Notes:

7. In your personal opinion, what do you think the general role of interactive whiteboards should be in the ESL classroom? Please explain your answer in detail. (RQ1)

Notes:

8. Do you feel the training you have received for using the interactive whiteboard adequately prepared you for implementing the technology in your classroom? Explain your answer in detail. (RQ2)

Notes:

9. How differently, if at all, do you think your students respond when an activity uses an interactive whiteboard compared to an activity that does not use it? Please explain your answer in detail. (RQ3)

Notes:

10. What changes, if any, would you make to the interactive whiteboard training program at your school? Explain your answer in detail. (RQ2)

Notes:

11. Could you please describe a time when your students were able to engage with one another in order to accomplish a task using the interactive whiteboard? Please explain your answer in detail. (RQ3)

Notes:

12. What do you think your reaction would be if, for whatever reason, you weren't able to use interactive whiteboards in your classroom for an entire school year? Please explain your answer in detail. (RQ1)

Notes:

13. In your opinion, how do you think the use of interactive whiteboards has influenced your teaching strategies? Please explain your answer in detail. (RQ1)

Notes:

14. What suggestions would you give school districts that are thinking of implementing interactive whiteboard technology into their classrooms in the near future? Please explain your answer in detail. (RQ1, 3)

Notes:

15. Do you have anything else you would like to mention about the use and implementation of interactive whiteboards in an ESL classroom? (RQ1, 2, 3)

Notes:

Biographical Information of the Interviewee:

Age: _____   Gender: _____

First Language Spoken: _____

Other Language(s) Spoken: _____

Years of Teaching Experience: _____

Comments:

Amount of Time Using IWBs: _____

Comments:

Grade Level of Students You Are Teaching: _____

Comments:

Highest Degree of Education Achieved:

[ ] College (B.A., B.S.) [ ] M.A. [ ] M.Ed. [ ] Ed.D. [ ] Ph.D.

Comments: