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Emerging Perceptions of Interactive Whiteboards in EFL Classrooms
外国語教室での電子黒板(IWB)使用に対する新興認識

Adam Stone

概要：
電子黒板（IWB)は1990年代初頭に初めてビジネスの発表や打ち合わせのために作られました。それ以降教育の現場でたくさんの教室で使われるようになりました。基本的にIWBは、パソコンにデータプロジェクターとセンサーで繋ぎます。このセンサーは、指やペンとプロジェクタースクリーンの接触点を検出します。IWBはホワイトボードや黒板の様に、そしてマルチメディアとしても使うことができます。その上ユーザーは普通のパソコンのマウスやキーボードのように縛られることなく黒板やペンと紙のように直接プロジェクターに描くことができるのです。2016年、九州産業大学はPromethean‘ActiveBoard’IWBを６台語学教室に設置しました。このIWBを使う講師は意外と少なく、よく聞く理由はテクノロジーが怖い、経験やトレーニングが足りない、ただ忙し過ぎるということです。当たり前ですがIWBを授業で使う講師達には、テクニカル面に詳しいことだけではなく教育面にも研修が必要です。このIWBの研究をとおして、外国語を学ぶ学生やそれを教育する講師が、教育の手段としてIWBを選択することをサポートし、そしてまた外国語教員の専門的能力の開発に貢献したいと思います。

キーワード：educational technology, interactive whiteboard, listening, speaking

Abstract:
Interactive Whiteboards (IWB), initially promoted as a cutting-edge communication technology for business presentations in the early 90s, have subsequently been adopted into many schools’ classrooms. A basic IWB setup consists of a computer connected to a data projector and a sensor that detects haptic interactions that happen on the projector screen. Like traditional whiteboards and blackboards, IWB have the immediacy of pen and paper. They can also display multimedia like a data projector, however it frees the user from using the computer’s keyboard or mouse. Kyushu Sangyo University has had six Promethean ‘ActiveBoard’ IWB installed for use in EFL classes since 2016. It seems that few teachers have been actually using these IWB. It is already clear that teachers will need some training, not just on the technical details, but also on a pedagogical approach that is in line with their own personal teaching philosophies.
The motivation that drives this study is to find ways to better support the adoption of this teaching tool in the EFL classroom by teachers, students and educational institutions, and to contribute to EFL teachers’ professional development.

1 Introduction

Interactive Whiteboards (IWB), initially promoted as a cutting-edge communication technology for business presentations in the early 90s, have subsequently been adopted into many schools’ classrooms. A basic IWB setup consists of a computer connected to a data projector and a sensor that detects haptic interactions that happen on the projector screen. Like traditional whiteboards and blackboards, IWB have the immediacy of pen and paper. They can also display multimedia like a data projector, however it frees the user from using the computer’s keyboard or mouse.

1.1 Motivation to investigate IWBs

My own first personal experience with IWB was during a training workshop for ALTs (Assistant Language Teachers) in 2006. We were given a demonstration of an IWB and its dedicated software and supplementary textbook that was targeted at Japanese elementary school students learning EFL (English as a Foreign Language). This particular system consisted of a freestanding whiteboard, data projector, a laptop computer and a sensor that clipped onto the whiteboard. It was delicate, precarious and a lot of time was spent calibrating and setting it up. At one point the demonstrator in his enthusiasm tripped over the cables, and had to start the calibration all over again. Although this was presented as the future of English as a Foreign Language teaching technology, many teachers remained unconvinced and underwhelmed.

Kyushu Sangyo University has had six Promethean 'ActiveBoard' IWB installed for use in EFL classes since 2016. I attended a one hour training session conducted in Japanese by the IWB company representatives. We were shown how to connect and calibrate it, and how to download and use the software. The bundled software, ActivInspire, is type of program known as a 'flip-chart'. With this software, one can import and arrange multimedia to react in different ways to the users' interactions. There is also a handwriting recognition function that can convert handwriting into ascii text. Users are able to use other software on the IWB such as web browsers, PowerPoint, paint programs on the IWB, however the range of functions is limited.

It seems that few teachers have been actually using these IWB. Informal chats with teachers revealed common threads; apprehensions to technology, lack or training or experience, or are too busy to be enthusiastic about them. These themes echo the reactions to the clumsy presentation I witnessed in 2006.

It is already clear that teachers will need some training, not just on the technical details, but also on a pedagogical approach that is in line with their own personal teaching philosophies. The motivation that drives this study is to find ways to better support the adoption of this teaching tool in the EFL classroom by teachers, students and educational institutions, and to contribute to EFL teachers' professional development.

1.2 Research Questions

Numerous studies from around the world on IWBs in primary, secondary and even high schools can be found (Balta & Duran, 2015), (Campregher, 2011), (Davis, 2007), (Gashan & Alshumaimeri, 2015), (Higgins, et al., 2005), (Kershner, et al., 2010), (Mathews-Aydinli & Elaziz, 2010), (Moss, et al., 2007), and (Öz, 2014) (Campregher, 2011), (Davis, 2007), (Gashan et al., 2015), (Kodaira et al., 2013), (Otsuki et al., 2003) research on IWB usage in Japanese EFL classes in at a tertiary level is scarce.

Johnson et al. (2010) lament "*that there is a dearth of research literature examining their (IWB) use in tertiary-level English language teaching*" (p.199). Öz (2014) also cites a paucity of "*empirical research evidence regarding the effectiveness of the IWB technology in L2 teaching and learning*" (p.157).

A gap exists in the research of IWB in EFL classes in Japanese tertiary institutions. For teachers using IWB in EFL classes, this paucity of research and literature on IWB and language learning needs to be addressed.

As technology becomes ubiquitous in our daily lives, in business, and in education,

the perceptions that begin to emerge will affect how it is or is not embraced (Borg 2009).

While IWBs are starting to become more common in EFL classrooms in Japan, many schools and new teachers do not have much experience with IWB or may not be technologically motivated. The general aim of this research project is to investigate the emerging perceptions of newly installed IWB in EFL classes at a university in Japan. This investigation will focus on teachers' and students' emerging perceptions of the IWB's usage as a pedagogical tool. To explore these emerging perceptions of interactive whiteboards (IWB) a qualitative approach is being used to investigate the following research questions:

1. What are teachers' and students' emerging perceptions of the IWB and its effectiveness?

2. How do teachers use this teaching tool to align with their teaching principles?

2. Literature

As technology becomes cheaper and more powerful, computers and data projectors are becoming commonplace in many university classrooms. Technology / Computer Assisted Language Learning (TALL / CALL) takes advantage of multimedia and computer power to facilitate language learning activities such as blended learning (Ştefan 2016) (Langa 2016), spaced learning and gamification (Otsuki et al. 2004)

Many educational institutions around the world have recognized this potential, and have invested in IWB in their classrooms. In America, Desantis (2012) reported that by the year 2009, 28% of teachers had access to IWB.

The UK seems to be leading the IWB revolution where it is claimed that 60% of high school *classrooms* have at least one IWB installed for use in the classroom (Davis, 2007). This saturation of IWB in the UK is partially due to a project called the Schools Interactive Whiteboard Expansion project (SWE) that was established in 2003. Moss et al. (2007) evaluated the SWE project, however they were unable to resolve whether or not usage of IWBs in the classroom were more beneficial than that of the data projectors.

An NHK survey found that 70% of *elementary schools* in Japan have access to a single IWB. (Kodaira, 2012). In 2006 there were l*ess than on*e IWB per school or university (Shimizu 2006). Shimizu is concerned that Japan "*aims to be one of the world's leading IT nations, but has made little progress in embracing it in education*" (p. ii).

2.1 Diffusion of Innovations

If IWB are being used to simply display content, then it is no different to a data projector setup. To be successfully adopted, the IWB should be able to do at least everything that its the traditional blackboard or data projector can do. Certainly, one of the biggest advantages of the IWB, is being able to navigate content directly via the screen, freeing the teacher from the computer and keyboard. (Koenraad 2008)

According to Rogers' (1983) theory of diffusion of innovation, there are five factors that will lead to the technology's success; relative advantage, compatibility, complexity, trial-ability, and observability (p.211).

Relative advantage: The degree to which an innovation is perceived as being better than the idea it supersedes.

Compatibility: The degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters.

Complexity: The degree to which an innovation is perceived as relatively difficult to understand and use.

Trial-ability: The degree to which an innovation may be experimented with on a limited basis.

Observability: The degree to which the results of an innovation are visible to others.

A study of female English teachers at a university in Jordan by Jwaifell and Gasaymeh (2013) was guided by Roger's (1983) theory of diffusion of innovation. They found that "*The five characteristics of IWB, as mentioned in Rogers's (2003) theory, have played a crucial role in motivating all the four participant teachers to use IWB in their teaching*". (p.146)

Cowie et al. (2013) found that a novice teacher's pedagogy does not have to change radically in order to adopt some simple e-learning tools. However, the predominant obstacle they identified was the Japanese institution itself, where despite access to some cutting-edge technology, the administration did not provide enough support, due a lack of understanding of the technology. This problem is not just peculiar to Japan, but also evidenced in a Canadian university in a project by Diochon and Cameron (2001). They also reason that these new technologies often fall short of expectations is due in part to the teachers' unfamiliarity, inexperience, no perceived benefit; insufficient understanding of its potential; or simply a fear of the unknown or change to the status quo. In other words, the teachers could not see a 'relative advantage' as described by Rogers (1983).

Rogers says that innovations must be compatible with existing philosophies of the adopters in order to be successfully adopted. Teachers may resist changes because they feel they may have to make changes to their pedagogy. Diochon et. al. (1983) says that it is "*ironic that universities, which exist to create inquiring minds that will challenge the status quo, have resisted changes to their bureaucratic structures*" (p.115).

In line with Rogers' theory, complexities such as the technical difficulties associated with IWB can undeniably affect the motivation and therefore the successful adoption of IWB. In Mathews-Aydinli and Elaziz's (2010) study on teacher's attitudes toward IWB, they identified practical problems that may occur with the IWB. Computers may break down or freeze up, screen visibility, ergonomic issues such as the physical location of the board in the classroom, and safety issues such as cables and wires that may be tripped over. Kershner et. al. (2010) have also identified disruptions that can happen in a classroom; "*productive collaboration can be particularly disrupted by technical difficulties*" (p.381).

2.2 Three levels of IWB proficiency

Basmatzi (2014) has described the three levels of IWB proficiency as Supported Didactic, Interactive and Enhanced Interactive.

1. Supported didactic: teachers make some use of the visual element of the IWB to illustrate concepts instead of helping the students develop conceptually through them. They follow a traditional teacher‐centred approach although they may begin employing their own material in a traditional way via Excel, PowerPoint or other commercially produced programs.

2. Interactive phase: A progression from the supported didactic stage although the full potential of IWBs is not fully realized and developed. Teachers may lack confidence in utilizing the technology, but they integrate the IWB into their instructional practice and try to explore further the capabilities of Excel, PowerPoint and the software accompanying the IWB in order to aid the conceptual development of their students through various verbal, visual and aesthetic stimuli.

3. Enhanced Interactive: A progression from the interactive stage. Teachers consider technology an integral part of their lesson and try to foster the cognitive development of their students by taking advantage of the interactive feature of IWBs. They are familiar with the techniques available, confident with the use of technology and offer their students the opportunity to engage in individual or collaborative active learning by reacting to the IWB stimuli (p.327).

By describing these three levels we can see the evolution of IWB users. While this is not a prescription, this awareness of the competence levels can be helpful for users to reflect upon their own abilities.

Desantis (2012) is optimistic about the potential of the IWB. "*There is little doubt that interactive whiteboards, in the hands of passionate and well-trained teachers, can be used to deliver highly effective instruction to students.*" (p.52). He has three recommendations to achieve this;

1. Build efficacy by scaffolding the instruction of new tasks
2. Establish long-term collaborative partnerships among teachers,
3. Include positive supervision that encourages teacher self-reflection and measures student engagement with digital media using the IWB (p.51).

In a Japanese setting however, this collaborative attitude may not be so prevalent. Liversidge (2013) found that many teachers "*are very reluctant to share materials, discuss how courses are proceeding and what worked or did not work. Furthermore 'reflective' practice, the closest translation of which is 'hanseiteki na' in Japanese implies a negative criticism. The constructive analysis of reflective practice and sharing and discussion is not encouraged within the teaching environment. Institutions also do not see any reason to provide or allow time for it. Thus, one of the core strengths of IWBs of sharing and collaborating does not occur often within or across Japanese educational institutions*" (p.167).

Despite the fact that teachers need continuing professional development in order to understand and use the technology effectively, this cultural difference in attitude presents an obstacle for training and collaboration in the Japanese setting.

Although many EFL teachers may be non-Japanese and may not be subject to the local cultural constraints, the institution itself may not be so open to promoting the *'Establishment of long-term collaborative partnerships among teachers'* (Desantis, 2012).

2.3 Effectiveness of IWBs

Mathews-Aydinli et. al. (2010) warn *"institutions considering the extensive costs of installing IWBs in their classrooms, the research has still not yet shown empirically whether the claimed benefits of IWBs are related to unique characteristics of this technology or whether they could be achieved with alternative, perhaps already existing, means"* (p.236).

In their SWE project evaluation, Moss et al. (2007) were unable to resolve whether or not usage of IWBs in the classroom were more beneficial than that of the data projectors. They found that that math and science were the main beneficiaries of IWB, and the English departments were equipped last of all. It was suggested *"that the visualization of ideas allowed by an IWB might be more appropriate to mathematics and science than to English"* (Kneen, 2015).

In an evaluation of a project called 'Embedding ICT (Information and Communications Technology) in the Literacy and Numeracy Strategies', Higgins et. al. (2005) found that the teachers and students responded positively and it seemed that the IWB had had a real impact on the primary classrooms where they were introduced. Subsequently the students in these schools performed marginally but statistically significantly better on national tests in mathematics and science, compared to other schools nationally. However, in the following year no difference was found in performance on national tests for these same schools. It was suggested that that the early improvement was due to the initial intervention or that sustained improvement is harder to achieve. They found that there is some evidence that IWBs can improve the performance of low-achieving pupils in English and that the overall impact is greatest on writing. Kneen (2015) has looked at how IWB were being used in secondary school English classes in the UK. Although the IWB afforded the teachers with a wide range of resources though different media, she identified that a limitation was upon that of spontaneity in the classroom. One of the limitations of the IWB identified in Kneen's study was the difficulty of writing on the IWB, compared to a traditional blackboard.

Kershner et al. (2010) found that IWB can support primary school students in their science class, but warned that the IWB is not to be seen as *"an entirely distinctive or pedagogically transformative learning resource in the primary classroom"* (p.361). Like ordinary chalk blackboards, pen and paper, and textbooks, IWB are just another tool that can be used for teaching. It is how these tools are used to teach that is important.

Cowie et. al. (2013) investigated the use of some e-learning tools, teaching approaches, and levels of institutional support in four situations; Japan, New Zealand, Singapore, and the United Kingdom. They showed that for teachers with little background in technology this can be an area of uncertainty. They concluded that *"for many teachers, technology might appear to be a threat but ... have come to see it as a challenge and opportunity to widen and improve our repertoire of teaching practices"* (p. 467). With this in mind, teachers must also be cautious not to view technology as a panacea. Simply using a computer to learn does not necessarily equate to better learning.

2.4 Classrooms as social environments

Classrooms are social environments where observable interactions take place. The IWB has the advantage of being directly operated by anyone in the class, thereby giving power to the students and contributing to a more student-centered lesson. Kneen (2015) looked at the affordances of IWB for seven English teachers at secondary schools in England, in particular how they use IWB within their lessons, in terms of lesson timing and stages of teaching such as gaining attention, identifying objectives, recalling prior learning, presenting stimulus, guiding learning, eliciting performance and assessment. Unlike traditional blackboards, the IWB was found to be not used for spontaneous creation of resources or exploration of ideas. It was observed that the most common usage of the IWB was to display preprepared content. The IWB would often serve as "*a whole-class text book, albeit one focused on the needs of an individual class.*" (p.221) Kneen's concluded that the IWB could very well support whole class interaction.

Kershner et.al. (2010) asked if IWB can support collaborative communication and thinking in classroom science activities in the context of science classes in UK primary schools. Issues that were highlighted in this study included the children's use of classroom 'talk rules' for collaborative communication and thinking, the use of IWB functionality and working space, and the social routines and management. It was suggested that the IWB can be used collaboratively in a variety of activities closely related to familiar classroom practice and the children can engage effectively in the collective learning experience. While Mathews-Aydinli et al. (2010) have voiced concerns that IWB use may make students more passive by reducing teacher-student interaction and may lead to more teacher-centered instruction.

Gamification and competitiveness have been found to be a significant motivating factor in language learning. Otsuki et al. (2004) evaluated educational software that employs group competition using a large interactive electronic whiteboard to teach Kanji characters in two elementary schools in Japan. Gamification and the safety of working in a team help to lower affective filters such as the fear of making mistakes.

2.5 Teachers' and Students' Perceptions of IWB

Moss et al. (2007) acknowledge that the introduction of IWB alone will not transform existing pedagogies, but that it is what the teachers think it is for that fosters changes. Many teachers have realized that the IWB can do more than just display content, it can put more control into the hands of the students, thereby supporting a more learner centered lesson. (Basmatzi 2014)

In a study by Johnson et. al. (2010), they acknowledge that IWB have a great potential for learning opportunities in language lessons. Through interviews, focus-group discussions and direct classroom observation, they investigated teachers' and students' perceptions of the IWB in the context of English language teaching at a New Zealand university. Both teachers and students noticed that the IWB "*afforded an enhanced interaction with the teacher, not just course content*" (p. 205). In other words, in an IWB class the teacher spent less time writing on and speaking to the blackboard and more time interacting with the students.

Limitations associated with the IWB were also identified, such as old computers and the need for professional development opportunities.

Just as the affective filter is key in how much intake the students can absorb,

teacher cognition plays a huge role in the teachers instructional choices. The degree to which a teacher embraces or rejects an idea or tool into their own teaching practice hinges upon their own beliefs and knowledge. *"Teacher beliefs are now seen as one of the most influential factors behind teachers' decisions and actions in the classroom"* (Kalaja et. al., 2015, p.71).

Among Borg's summaries of what is known about the nature of teacher cognition, he says that while these cognitions *"can be deep-rooted and resistant to change, they can also interact bi-directionally with experience"* (Borg, 2009, p.1). In other words the teachers' beliefs can influence how they teach English, but these praxis can also lead to changes in the teachers' beliefs. These cognitions or beliefs and philosophies can exert a persistent long-term influence on teachers' instructional practices. Any apprehensions of the IWB by the teachers will hinder the adoption process, likewise the opposite is also true; IWB optimism can only expedite its diffusion.

Tondeur et. al. (2013) have highlighted that the role technology plays in education depends on choices about the nature of teaching and learning processes that teachers prefer and want to realize. This has implications for the successful utilization of the IWB in the language learning classroom. Tondeur et al. (2013) used stimulated recall interviews (STR) to examine the integration of technology by primary school teachers using technology in their lessons. Their focus was on pedagogic content knowledge and how to use technology in innovative and creative ways within a subject area. *"Teachers select applications of technology in line with their selection of other curricular variables and processes that fit into their existing beliefs about "good" education"* (p. 436).

3 Methodology

Research into the effectiveness of the IWB as a tool may be addressed effectively by an empirical quantitative study, however an investigation into the personal beliefs and philosophies of the teacher are better revealed with qualitative data such as that of case studies (Duff, 2016). This investigation aims to paint a vignette, illustrate the stories of both the teachers' and the students' emerging perceptions of IWB. It takes the form of a case study, comparing two teachers' and their students' reactions to an IWB activity in their EFL class. Classroom observations, questionnaires and stimulated recall (STR) interviews were used to investigate the teachers' and students' emerging perceptions of IWB. This approach elicited rich data and gave a voice to the participants.

Participants completed a survey about their background, their perceptions of the IWB and the language learning that happens with it to address the first research objective. To investigate the second research objective, classroom observations with video recordings were conducted. Semi-structured STR interviews (Gass et al., 2005) with the teachers, prompted by videos from the class observations, were conducted to reveal more about their emerging perceptions of IWB and the interactions that took place in the classrooms.

3.1 Participants

Andrei and Noel (pseudonyms), two experienced teachers of English and their students agreed to participate in this research investigation. Andrei is proficient in, experienced with, and enthusiastic about using computer technology in and around his classes. Noel is competent with computers. He is eager although somewhat cautious about using technology. Neither Andrei nor Noel had any experience with using IWBs in their classes, however both have been scheduled with an IWB installed classroom. They both regularly use the IWB as a data projector with their computer. Andrei and Noel are at what Basmatzi (2014) would describe as a supported didactic level of IWB use.

3.2 IWB activity

To build efficacy (Desantis 2012), a game-based activity was provided to trial in Andrei's and Noel's classrooms. Learners working together in groups display greater motivation, more initiative, and less anxiety regarding their learning (Pica 1996). The IWB lends itself well to a gamification approach (Otsuki et al. 2004).

This activity aimed to give the students an opportunity to practice pronunciation of numerical prices in English. This content was adapted from the textbook from this course. In this activity, there are two kinds of multimedia IWB interactions - drawing or writing, and drag-drop. These actions can be done simultaneously by four people using their fingers.

The class is divided into four teams, and a team-name and leader for each team is decided. On the IWB screen are 24 prices written in numerical digits. Under these prices are four piggy banks. The leaders come to the IWB and write their name digitally under the piggy bank with their finger. They go back to the teams and a new leader is chosen. The next four leaders stand in front of the IWB. In the first round the teacher calls out some prices and the students race to find those prices. The first to drag-drop them into their team's piggy bank will get the points. The teacher then checks the prices with the class and one point is awarded for each correct price in a piggy bank. In the next round the teacher shows prices to the teams, but not to the leaders, and the teams must call out these prices to their leaders, who again compete to drag-drop the most correct items into their piggy banks. The teacher and the class again check the prices and points are awarded for each correctly identified price. The team with the most points is the winner.

I supplied the teachers with a lesson plan for it and told them they were free to change it or use this activity as they pleased.

3.3 Data collection tools

I used three data collection tools to triangulate the data: classroom observations, surveys, and semi-structured interviews with stimulated recall. I arranged a classroom observation with video recording of this IWB activity with each Andrei and Noel. The purpose of the classroom observations was to provide the researcher's perspective on the how the activity proceeded, providing further verification for the teachers' and students' perceptions.

Permission and encouragement to carry out this research project at Kyushu Sangyo university was obtained from the Director of Educational Technology at Kyushu Sangyo University. The teachers agreed to trial this activity in their class, they felt it was relevant and beneficial to the students' study. An introduction and information

sheet and consent form was given to the participating teachers. Each student also received an explanation sheet, consent form and a survey, all in Japanese, prior to the activity. The survey was completed immediately after the activity. The purpose of this survey was to elicit students' perceptions of the IWB lesson and also to get some background information about the students.

The IWB activity was facilitated solely by the regular teacher of this class. The researcher was present to take notes, but did not participate. The lesson was video recorded which was later used to stimulate recall in a semi-structured interview with the participating teachers in order to elicit their perceptions and to generate rich qualitative data. I also prepared a survey for the teachers that would drive extra questions during the interview.

4 Findings and Discussion

The interviews with the teachers were audio recorded and transcribed, and coded into the following four themes: 'Teaching philosophies, Interactions, Tools, and Perceptions'. A spreadsheet table was used to triangulate them against the observations, surveys and interviews.

4.1 Teaching philosophies

For Andrei, technology is an extension of his body. In his regular classrooms he uses technology naturally, intuitively and extensively. He sees value in both teacher and student-centered approaches, although ideally, he prefers a student-centered approach. He likes the students to use team work especially in big classes. While he likes to have face to face time with the students, he acknowledges that big class size is something of a limitation. *"I want to be everywhere, but I can't clone myself. I want to be with every team".*

Andrei initially felt that this IWB lesson was teacher-centered. He reported that he gave more instructions than in his usual lessons.

Andrei does not usually employ games in his classes, and subsequently does not find a reason to have the students write or draw on the whiteboard themselves; *"as far as the whiteboard goes I am really very economical using the whiteboard, I don't use it a lot."*

Interview excerpt #1:

Andrei: Definitely there was a lot of action going on, I felt that this was the most exciting class, and the kind of class where nobody could fall asleep.

Author: Because they were standing?

Andrei: Yeah, they were standing and they have to be doing something, as far as engagement goes, this was probably the best class.

Author: Why do you think it was exciting? Because it's a new technology? Because of what it can do?

Andrei: It could be that, I find them being generally more excited about doing new stuff in class, and I think oh it's working and then three weeks later it kind of gets dull, so it was new and some of them definitely felt uncomfortable, and you can see that, this boy here (pointing to video), this is Ryuuhei I believe, he's standing there, he's the shy and silent quiet kinda guy, it's not like one person standing in front of the whiteboard, it's a bunch of them, so it makes them feel less pressure, so as far as that goes, I really like it, it gave me so many ideas for my future classes.

Like Andrei, Noel also tends toward a teacher centered approach. While Andrei used mostly English, Noel facilitated the activity using a mixture of English and Japanese. Noel uses a *"lot of Japanese"* in his lessons, *"not necessarily content related, but instructional things, I find it makes things move smoother and quicker. I do my best to try and translate it back, say the same thing back in English too"*.

He likes to use pair work and a lot of listening practice, with not so much writing practice. For teaching pronunciation, he has the students *"repeat the whole thing, and then I'll get them to take a role, I'll be A, they'll be B, then I'll switch the roles, and then I pass it on to them, do it in pairs. So that then they have an example, prime and then produce."* Although he says that he doesn't find this to be the best use of class time.

Noel is very aware of what is going on in his class, and can modify or adjust the pace on the fly. This teacher centered approach is due his beliefs that not all students are so proactive.

Noel was somewhat trepidatious about the IWB. He believes that technology such as smartphones in the classroom could be potentially beneficial depending on how it is used. Although he says, *"online homework is good for review"*, he concedes that *"as boring as this might sound, pen and paper, and books"* are as effective as anything else.

Noel does like to inject fun into his classes. He occasionally has the students use the blackboard for drawing pictures or for games such as Pictionary. As Otsuki et al. (2004) demonstrated, the IWB lends itself very well to the gamification of language learning. This was also seen in both Noel and Andrei's classes.

Interview excerpt #2:

Author: Are these kids like this all the time? They seem pretty to be pretty well behaved here, are these special circumstances?

Noel: In terms of behavior, it's a good class, so that's not an issue here at all. The hard thing is getting them to willfully participate, they will listen, they will do what's asked, but they will never go beyond that duty.

(Video; Andrei): I want you to choose a group name, a team name

Noel: This one, I knew it would be a bit of stunner, it was, so I'm giving them a bit of pressure, because I know that this is going to be hard for them, I don't want it to detract from the activity work, the group name isn't the main thing.

Author: one girl cottoned on pretty quick, right? she pressed the button, she clicked it to pen mode

Noel: yeah, she might have, she might have seen us... I like it for the corrective ability, you can make a correction right there... it's sort of similar to pen and paper, you can show them exactly right there, but it's not exclusive to that one student, everybody can see it

4.2 Interactions

Andrei was asked why he thinks the students were engaged.

Excerpt #3:

Andrei: Because they have to stand up? Because they have to talk to each other, play a game, or because it's a digital whiteboard? I don't know, I know one thing for sure, that if they can touch a big screen you can do more stuff with it.

Author: Exciting because they were standing?

Andrei: Yeah, they were standing and they have to be doing something. As far as engagement goes, this was probably the best class.

As the activity progressed, and as the students gathered confidence, a kind of scaffolding became apparent.

Andrei: At the end of the class, when we gave them the big numbers, the usual reaction I get is 'eeeeeh?! I don't wanna do that!'. But they were like 'ok, we've already done easy numbers, why don't we try something more difficult'. So, I guess that felt like 100 plus one, they already had this foundation, they felt like challenging something harder, because it's a game they felt more relaxed, thats also a positive thing about it.

At a micro level, these students were experiencing a visual-haptic-cognitive interaction with the text at the IWB. While very different to a traditional projector usage, this activity had similarities to a card game like Snap or Speed.

Interactions in this activity were happening mostly between classmates instead of teacher-student interaction. The students' interlanguage was sufficient to communicate. Numbers like '*suree* and *seben* (three and seven) worked because this is a common way to say it amongst these learners. A positive aspect of this is that the students affective filter may have been lowered because they were speaking with their non-native speaking peers who also have imperfect English pronunciation, as opposed to the teacher which may make them nervous.

One student said that they were *"nervous when going to the front"*. Using the IWB in front of their peers could raise some students' affective filters. So, while Otsuki's (2005) research has suggested that along with group work, gamification can be very effective in the classroom, it may be prudent to bear this in mind when designing game like activities.

Features that make the input more comprehensible (Pica 1987), became difficult to do because the environment was noisy due to the high-tension nature of the game. The students did not appear to resort to using Japanese, some would point up or down to help their team mates locate the correct item.

1. Confirmation checks did occur; some students did repeat back the items.

2. Clarification checks often took the form of gestures such as
   - pointing to items, while saying "*kore, kore*?" *(this one, this one?)*
   - cupping the hand to the hear
   - holding up the forefinger and saying, *"one more time"*

3. Spoken comprehension checks were not noticed. The students were racing against each other, so they would grab whatever they could and when they made a mistake their peers would correct them. Some used demonstrative gestures of the numbers to confirm, (e.g. showing four fingers to signal the number four).

In my observations, I noticed that when four people were at the IWB, it became difficult for the rest of the class to see the IWB. This is something that IWB activity designers need to be aware of. Noel found this to be an engaging factor for the class. *"Only four people were actively using the IWB at a time however everyone in each group was active in the overall activity"*. Some students commented that some items on the board were hard to reach. Others commented that the IWB was at times sluggish, or that *"The touch panel reaction was slow"*.

For this IWB activity, Andrei had his students stand up and move around. This was his innovation, and it worked very well because it forced the students to become engaged. This seemed to agree with the students' philosophies, one said that "*by moving one's body, the lesson became fun*".

Andrei noted that in pair-work activities when students are unsupervised they will often use Japanese to help each other out. During the interactions that happened around the IWB during the lesson, Andrei was happy to see the students not cheating. *"I felt like they actually played by the rules, they didn't try to tell them the Japanese, they actually just tried to say it louder, they thought it would help"*.

Recasts or negotiating of meaning seemed difficult because of the high-tension nature of this activity. The sound levels quickly escalated to a point where students

were cupping their hands to their ears, they may have even had to resort to some kind of lip reading!

Noel noted that one of the benefits of the IWB is that it could be used like a big textbook or the whole class to use. *"You can show them exactly right there, but it's not exclusive to that one student, everybody can see it"*

In terms of his relationship with the students, Andrei said that he felt closer to his students after using this IWB activity.

Andrei: I felt like this class was a sort of a icebreaker. I know it sounds terrible because this is like week eight or nine in the semester, it's not like we had a bad relationship, but I felt like they started feeling closer to me...asking more questions after this class when we had this time to play together. So is that thanks to the interactive whiteboard? Yeah, I guess so, because this wouldn't be possible without this.

This kind of positive atmosphere can only be conducive to the learning environment.

4.3 Tools in the classroom

Andrei is very computer literate. He is an avid user and proponent of computers and technology with his English classes. One of his favorite pieces of software is OneNote by Microsoft. With this software he has set up an online environment for his students to collaborate and submit homework. His students often work in teams and use their own computers in class. He expressed an interest in using OneNote with the IWB.

Although Andrei does not usually use the IWB in his classes, Andrei does use the regular data projector and screen, however, in my observation, not quite as much as I expected. He uses it for administering tests and displaying content such as the answers to the textbook problems.

As for the IWB activity he tried in his class, Andrei suggested that an activity like this could possibly be achieved without the IWB. Although he conceded that more preparation time and paper would probably be required. *"The IWB does it better, and is eco-friendlier, and is generally easier to prepare for. All you need to do is make yourself comfortable in your chair, prepare something and take your computer to class, although connecting to the actual IWB is a nightmare..."*

Interview excerpt #4:

Author: How do you display correct answers to things?

Andrei: I project them, using the projector, so I use the PDF files that we have with the correct answers, and I just put it up on the screen, and very often I don't even do that, because with my computer I can actually draw, so I just show them the textbook, and as we go through the exercises that I think were difficult with some of the listenings, we listen to them together and I write it with them, on my screen and

they can see it on the screen behind me. So it's actually as if I am writing in the textbook, and you can see it on the big screen. But that's how I do it but if I need to show the answers I just put them up on the screen, show the PDF file.

Noel uses a data projector for administering tests and displaying content. Only one of his 21 students had seen an IWB before 2016. He uses his computer to play audio for listening activities, and occasionally the internet for showing movies.

Noel is familiar with computer technology such as the Google suite and the Office suite, and is starting to use Moodle, however he said he is by no means proficient. Noel is not afraid to use technology in his class, ideally, he would like to digitize everything. He doesn't like to use a lot of paper handouts, he prefers to project it and give blank paper. He says that he does use the textbook a lot. *"I get them to draw pictures sometimes, like Pictionary. I try to digitize everything, or project it and just give blank paper."*

Noel's interpretation of how the IWB could be used was as having *"multiple students interacting with projected content, to have the content there and manipulatable by multiple students as opposed to students just writing content"*

4.4 Perceptions of the effectiveness of the IWB activity

Andrei: When I said, 'did you learn anything?' They nodded, and what did you learn? They were like 'numbers, prices', he said. So that's actually quite impressive, because I like when students leave the classroom aware of what they learned in it. Unless we assess them, we don't really know what we have achieved, we definitely had a lot of fun. They definitely said a lot of numbers.

One of the students also commented on the lesson content; "*I didn't know how to read numbers (prices) but I came to know how*"

Students from both classes indicated that they were very open to using the IWB, many said that they wanted to touch and use the IWB. Having the students stand for this activity was Andrei's innovation, and not part of the original lesson plan. It seemed to work very well, however in my observation I did notice that it became somewhat difficult for other students to see the IWB.

Andrei: Definitely there was a lot of action going on, I felt that this was the most exciting class, and the kind of class where nobody could fall asleep.

Even though the students were at the front of the class, most appeared to feel safe and relaxed. This was probably due to the game like nature of the activity, their 'safety in numbers', or perhaps the familiarity of a computer screen.

Andrei: It's not like one person standing in front of the whiteboard, it's a bunch of them, so it makes them feel less pressure, so as far as that goes, I really like it, it gave me so many ideas for my future classes".

This seems to be an advantage for using IWBs. In a collectivist society such as Japan, IWB games or activities such as this can encourage group thinking, and a willingness to communicate, thereby mitigating risk-taking. It may be that this positive reception is due to the novelty of the IWB.

Andrei: It could be that, I find them being generally more excited about doing new stuff in class, and I think oh it's working and then three weeks later it kinda gets dull.

Andrei speculated as to what some of the students in the video recording of his lesson were thinking.

Andrei: The people standing here... at least they were thinking. I felt like they were with them, doing the same thing maybe visualizing themselves doing the same thing because they knew they would have to go and do it.

Andrei acknowledged that the content of this activity was not overwhelming and that they did have a reasonable amount of time to practice some high usage vocabulary. *"As far as the content quantity goes there was less in this class, and they had more time to practice it".*

Noel was impressed with how well he did with the IWB, as this was his first time to use it in a class. He noted that the students *"seemed very enthusiastic about it. Everyone got to touch it, everyone got to use it".* Some students said that their "*impression was very good*", that the IWB *"was fun, like a game"*, and that they were "*not just sitting and studying silently and furiously, but having energetic fun*". Some students also indicated that they are under no illusion of the pitfalls of technology; It takes time, it is bothersome, paper is easier. If the computer crashes, the lesson stops. Noel recognizes it could be the novelty factor that engaged the students.

Noel: On repetitive use, if it would have the same effect, I think it would get kinda boring.. and they would resent the fact the they just have to keep getting up in and out of their chairs, eventually. But that being said, I think that as a change of pace, it was extremely effective.

Indeed, some students said in the survey that "*it's like watching TV*". The novelty factor of the IWB could be replaced with new possibilities that become apparent with experience.

Noel: I think the content can be delivered in many different ways. It doesn't necessarily mean that it's better just because it's on an IWB, it's just novel. I think that with repeated use, you might be able to find something.

Noel expressed doubts as to whether the IWB would be effective in a class this size. (22 students).

Noel: Maybe one or two of the stronger willed students, would take control of it and everybody else would subside, be passive and then you've got two or three students who would benefit from it, those who are tech savvy. That's not a bad thing, you just gotta be aware of that. I think that in small classes, five or six, then yes, get them using it, but in larger sizes, I think that the teachers would be using it more often.

Noel was concerned about some of the technical issues such as the computer crashing or freezing, and design problems with the software layout itself - for example the MP3 player pops up in the middle of the screen.

Noel: I would take issue with is time. Coming in and setting up, calibrate every time, opening your software, setting your software up, there's ten minutes between classes, the window outside of your actual class-time grows, your working time actually increases and your workload increases with it… all that stuff leads to potential problems, not only for yourself, but also for other people who might have to use the room, same with ripping it all down. I guess with familiarity that would get smoother.

Early in 2016, an hour-long demonstration of the newly installed IWB was given by the company representatives in Japanese. Noel attended this twice but found it lacking. He was unable to use it straight away due to the unavailability of a software registration key.

Noel: So, I couldn't get it working with my computer, after both times that I watched the demonstrations. Had I been able to get that key when the demonstration was finished and then have access, I think I could have taken off pretty quick.
A little better orchestration on behalf of those giving the demonstration would have probably made all the difference.

This comment in particular is an illustration of what Gashan et al. (2015) and Basmatzi (2014) have both highlighted about the importance of ongoing training.

4.5 Discussion

An advantage of the IWB is that it can facilitate gamification (Otsuki et al., 2004) and promote group work which can lead to greater motivation, more initiative,

and less anxiety regarding their learning, (Pica, 1996). While many participants, including the teachers, enjoyed this activity, it has been suggested that this could be due to the novelty of the IWB. This should be addressed using longitudinal research.

Another advantage of the IWB is that it can facilitate face to face time with students because teachers are not locked behind their computers or writing on the blackboard. This will happen when the teachers have left their didactic phase of IWB use, and have moved into an interactive phase, where they can trust the IWB. Materials are easily electronically reproducible and distributable. This will require some cooperation amongst the users. Students can also use the screen, and any notes they make on the screen can be saved for future lessons or even shared in an online environment. To these participants, these relative advantages of the IWB do not seem to outweigh the disadvantages.

Andrei is very technologically positioned and this experience has caused him to think about new possibilities with his existing favorite software; OneNote. For him this technology is quite compatible with his teaching philosophy. However, he does not usually employ game like activities in his classes, so for him, he made need to find, create or adapt his own style of material for the IWB. Noel has said that he is trying to digitize everything for his lessons. Noel was very concerned with time; the time to reconfigure his lessons to incorporate an IWB, and the time it would take to set-up for each class. Noel occasionally does use game-like activities in his classes, so the IWB could be very compatible with his praxis in that sense. Some participants commented that this kind of activity could be done with paper or other means. Until content compatible materials for the IWB have been produced the advantages of the IWB may be difficult to see.

The complexities of the IWB are the most salient obstacle to its successful adoption. The software must be intuitive and easy to use even for the non-technology orientated teachers who use it. The software needs to be installed, connected and calibrated. Navigating the software needs to be simple enough for the teacher to use to produce the material, and to use during the lesson. Rearranging of the furniture in the classroom for each lesson is clearly not an advantage, a classroom dedicated to the IWB would be ideal.

Both Andrei and Noel seem reluctant to trial the IWB. The benefits of it are not immediately visible, and for them, it requires too much investment in time and resources. In the first phase the IWB proficiency, the supported didactic (Basmatzi, 2014), as the teachers use it for displaying content, they will notice a gap in their knowledge of how to use the IWB interactively. Special interest groups and workshops with regular follow up are required so that teachers can support one another. Due to the fragile nature of this technology, a backup plan for the inevitable computer crashes that will happen during the class would be highly recommended.

In this project, the results that were observable were the enjoyment and engagement levels of the students. These results are great for this particular class, however in order for IWB to succeed, these results must be observable to the adopters, and to the institution who invest in this technology. Ideally long term quantitative research would be undertaken and reported in peer reviewed publications and made available to

the teachers. Positive results may be spread by word of mouth, by IWB demonstration classes, or research reports such as this.

4.6 Limitations

Upon reflection on the data-gathering process and the quality of data, I found that while many teachers had opinions on, experience with the IWB or were enthusiastic to participate in this project, unfortunately very few were actually using the IWB in their regular English classes. This was not surprising as the IWB had only just been installed at the beginning of 2016.

Pre and post interviews and surveys would be ideal, however unfortunately due to schedule constraints this was not possible. However, triangulation of the data; surveys, interviews and observations, data was possible. So, while the sample size may have been small, it did allow for a more in depth analysis of Andrei's and Noel's experiences with the IWB.

As these IWB have only just been installed at the beginning of 2016, a longitudinal study would not necessarily be appropriate. The purpose of this project is to look at the students' and teachers' emerging perceptions of the IWB. Once the IWB has been established and teachers have moved away from using it didactically, longitudinal studies would supplement this project very well.

While this activity was fun and exciting for both teachers and students, opportunities to negotiate meaning were hampered by the high-tension nature of the game. An awareness of both the socio-cultural and cognitive mechanisms of language acquisition is needed in order to produce effective IWB materials. There has been no training workshops or material provided with this new technology, so a collaborative partnership among teachers needs to be fostered. The next step is to reflect upon and develop these materials for future classes.

5 Conclusion

Both Andrei and Noel are optimistic about and feel that IWB has the potential to engage the students. Both are aware that IWB is just another tool. There are some overwhelming logistical and technical issues such as software and hardware, prep-time, and material creation. The IWB will take some getting used to, materials will have to be developed, there is some technological and ergonomic cumbersomeness that will need to be overcome in order for it to see its potential.

1. What are teachers' and students' emerging perceptions of the IWB and its effectiveness?

Andrei and Noel have different teaching philosophies. They and their students both had a lot of fun with the IWB activity, but they are both cautious about assuming it as a panacea. Andrei was not accustomed to this kind of high tension activity, but he did find something in this experience that he can use in his future lessons. In this way, it reinvigorated his praxis, and caused him to reflect on his lessons which can only be a good thing. When issues surrounding time, such as preparation, producing materials and practicing using the IWB, have been addressed, and are seen to be outweighed by the advantages, Noel will be more enthusiastic about using the IWB. On the whole, the students from both classes showed enthusiasm for the IWB, but were also aware that it is just a tool.

2. How do teachers use this teaching tool to align with their teaching principles?

At this stage, the IWB are being used as content display, the teachers have a supported didactic level of IWB proficiency. For this project two teachers trialled an IWB activity in their English classes. The activity they trialled pushed them into an interactive level of using the IWB. For Andrei, the gamification of English lesson pushed him out of his comfort zone, however this gave him insights and ideas for future lessons. For Noel, gamification of English lessons is not completely new for him, and he seemed very relaxed doing this. The IWB can work well with gamification, it elicits group participation, can make a fun atmosphere, but both Andrei and Noel questioned whether this could be achieved by other means.

Whether or not Andrei and Noel continue using the IWB from here on remains to be seen, however Rogers (1983) theory of diffusion of innovation may give us insights into how the IWB can be employed effectively.

According to the surveys, observations and stimulated recall interviews, it seems that teachers do not perceive the 'relative advantage' of the IWB, are not willing or able to 'trial' or 'observe others' using it. The teachers perceive that is too 'complex' or bothersome. This study has attempted to reduce or mitigate these factors and focus on identifying its 'compatibility' with their teaching philosophies.

Looking at the IWB 'viewed from the lens of Rogers' Diffusion of Innovation Theory' (Jwaifell, 2013) has certainly shed light on why these and other teachers may be reluctant to embrace the IWB. It is my hope that these findings will contribute to literature on the IWB, the creation of better teaching material, and the development of IWB 2.0.

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