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Evaluating Educational Technologies: Interactive White Boards and Tablet Computers in the EFL Classroom

Abstract

One of the objectives outlined in "Trends and Development in Education, Science and Technology Policies": *MEXT 2011* by the Ministry of Education, Culture, Sports, Science and Technology of Japan is for all elementary and junior high students to use electronic versions of printed textbooks in the coming years. Students will use digital textbooks on tablet personal computers in classrooms with interactive whiteboards (IWB). This paper considers IWB and tablet computers (tablets) technologies for EFL learning and employs a language learning activity to demonstrate how IWB and tablets can be effectively implemented. The paper will discuss the pedagogic benefits and drawbacks of IWBs and tablets and will conclude that IWBs and tablets create a collaborative learning environment enabling scaffolding among students while also developing their digital literacy skills.

1. Introduction

This paper considers the use of Interactive White Boards (IWBs) and tablet computers (tablets) technologies for EFL learning and teaching. Mercer and Warwick (2011) define the IWB as a digital hub comprising a computer linked to a data projector and a large touch-sensitive electronic board, displaying projected images that can be manipulated directly by hand or with a stylus. A tablet is a wireless, portable personal computer with a touchscreen interface. This paper employs a language learning activity, titled 'the odd one out' (Appendix 1) to demonstrate how IWB and tablet technologies can be implemented in the EFL classroom. The pedagogical benefits of IWBs and tablet computers discussed in this paper include visual support for teaching, real-time information-sharing and feedback, and effective lesson preparation, organization and storage.

2. Description of educational setting

A class of 25 first year university students majoring in English education at a national university in the Kanto area of Japan was used as a case study. The students have had six years of English education at junior high school and high school. They enrolled in an English conversation course held once a week for 90 minutes that I taught. The aim of the year-long course is to develop English communicative competence through pair and group activities on a number of high interest topics. Students majoring in English education generally have

high motivation to try out innovative educational tools, which arises from their aspirations to become elementary, junior high, and high school English teachers in Japan or overseas. Because of the drive that the students have to accomplish their future career plans, many of them are open to embrace and try out instructional tools like IWB and tablet technologies. Sykes et al., (2008) describe the necessity of trying out new educational technology in education: "At present, education is entering a particularly critical stage that is marked by an urgent need to examine the role digitally mediated collaborative tools play, not only as a learning tool but as authentic means of communication and relationship building". Unfortunately, the university used as case study has insufficient equipment like LCD projectors and IWBs for teachers to be able to embark on teaching that places emphasis on the use of educational technologies. In fact, at the Education Department of the university, there is only one classroom equipped with an IWB and moving students to this classroom was not always possible due to classroom allocation constraints. Budgetary concerns were noted as one of the reasons for the scarcity of IWBs. Also, some faculty members are "technologically challenged" and prefer to hang on to the traditional whiteboard or chalkboard.

3. Comparing IWBs and tablets

Educational technologies are being increasingly used in classrooms by teachers and students and have become central to language teaching and learning. IWBs and tablets are two powerful educational technologies. In this section I will compare the technologies and make recommendations for their use.

3.1 Advantages of IWBs

One of the pedagogic benefits of IWB is that it enhances the scope of interactivity and learner engagement (Miller and Glover, 2007) and keeps learners' attention longer. Students learn better when they are fully engaged, and IWB is a hands-on teaching tool allowing students to be part of the education process rather than simply recipients of prepared information.

Another pedagogic benefit is that materials supporting instruction can be accessed and displayed in class. Video clips, manipulating objects or texts, or skill demonstrating can be easily shared. Kennewell, et al., (2007, cited in Gillen, et al., 2007) stated that IWB with related resources allows the user to prepare material in advance or quickly construct or retrieve it in front of class as with an individual PC. The display and sharing of information facilitates giving and receiving feedback in real time for the learning objective of bilateral interaction between teachers and students.

Saving and printing materials generated during lesson time is possible with IWB and makes it easier for teachers to review, re-explain and summarize subject matter effectively. As a result, both teaching quality and learning efficiency are enhanced. Miller, et al., (2005) noted that the ability to save lesson materials means basic lessons can be refined from class to class or years to years to meet changing pupil needs. As such, IWB images can be saved and printed,

so students do not have to take notes during class discussion thus allowing them to participate in a more engaged learning style. Because IWBs offer multi-media capabilities like sound, color, and movement, students become more focused and their attention during lessons is well sustained. Beeland (2002, cited in Genesi, 2009) observed:

> The IWB helps students who are visual learners by providing them with a variety of visuals ranging from text and pictures to the use of animation and videos. Auditory learners also benefit from using the IWB through activities such as listening to sounds or music as part of a classroom presentation. Even tactile learners find the IWB helpful as they physically interact with the whiteboard by touching and moving things on the screen.

When students come up and interact with their friends using the IWB, it makes the learning experience engaging and memorable.

3.2 Disadvantages of IWBs

New technologies can come with integral limitations that may hinder use. For example, designing and preparing IWB lessons is time consuming and reduces teachers' abilities to maintain a similar degree of focus on other aspects of the lesson. Teachers who have not been through sufficient competency training using IWBs can encounter frustrating challenges using them. New technologies can be very cumbersome and somewhat intimidating and may cause frustration to teachers, resulting in these technologies not being used to their fullest potential. Insufficient training can also dampen teachers' morale, as some teachers may fear making a fool out of themselves in front of their students struggling to operate IWBs. To this point Shenton and Pagett (2007) noted that, practical issues such as technical support and installation of new equipment could prove to be very troubling if these issues cannot be acknowledged in a reasonable fashion. In the same light, Glover and Miller (2007) remarked that in order for technology to make positive changes in today's classrooms, there is sufficient evidence that professional development support must be provided frequently.

Another disadvantage of the IWB is that only one person can use the board at any given point in time, which according to Shenton and Pagett (2007) limits the amount of interaction that the teachers can have with their students at any particular time.

3.3 Advantages of tablets

Tablets are portable wireless computers that can be used in a similar way, or in conjunction with, IWBs within the classroom setting. Tablets could be a big factor strengthening and enhancing classroom learning. Landis (2005) reports that wireless tablets allow teachers to stand at a distance from the IWB and control what is displayed on the whiteboard for the students to see.

Other benefits of tablets include the ability to access information, record data, and create podcasts. Tablets can be useful in gathering data for classroom

presentations and enhancing purposeful interactions in large classroom settings. Tablets can serve as dictionaries, timers, digital cameras and having almost the same functionality as a laptop computer. They can be used for desktop publishing, slideshow creation, video editing, amongst others.

3.4 Disadvantages of tablets

There are attendant liabilities using tablets in class. Distraction is a major limitation and a concern in teaching. With a tablet, students could potentially waste classroom time by texting, netsurfing, or chatting online, paying scant attention to the teacher or the work at hand. It follows, therefore, that such disruptive behavior would lead students to neglect their responsibilities and lose concentration doing such non-class-related activities with their tablets. Because students might fidget with their tablets during class, the likelihood that the teacher would be distracted by students' actions is increased, creating additional classroom management challenges.

Just like IWBs, students and teachers need to be familiar with the steps and details of operating tablets. In cases where tablets are used alongside an IWB, operations like exporting files from one device to the other also need to be mastered in order to use the technology to its full capacity.

4. Recommendation

Recently, IWBs and tablets are of growing importance and efficient as educational tools. This estimation is supported by second language acquisition (SLA) research that has established that language-learning development depends on the key concept of "input and output". Input is used to mean samples of the target language, which learners see and hear, while output refers to the language that the learners produce themselves. Krashen and Swain first hypothesized the concept of input and output in SLA. According to Krashen (1985), SLA takes place when the learner understands input that contains grammatical forms, and the right level of input is attained automatically when interlocutors succeed in making themselves understood in communication. Swain (1985) argued that comprehensible output also plays a part in L2 acquisition. However, she emphasized learners must be "obliged" to produce comprehensible output, as comprehensible input alone is insufficient for L2 learning. Teaching and learning using IWBs and tablet computers involves both input and output; learners negotiate meaning through interaction to produce language for learning and proficiency. Recent advances in educational technology highlight the need for focusing on real-world, meaningful and authentic language use that allows space for unplanned and even unpredictable learner contribution. In light of this, IWB and tablet technology can offer the educator an exciting platform for designing and implementing pedagogical materials and classroom activities that create opportunities for enhanced interaction, collaboration, and negotiation of meaning.

5. How the recommended technology was used?

For this paper, I used a language learning activity titled 'the odd one out' to implement IWB and tablet technologies into the EFL classroom. The goal was to have students learn the language of giving reasons using **why** and **because.** In the activity, 5 groups, each with 4 words, were prepared. Each group of words contained an odd word, "the odd one out". There was no "correct" answer, but I decided on an answer and did not tell the students because telling the students would inhibit discussions. Pairs of students took turns identifying the word they thought was odd and gave reasons. Even if the reason they gave was justifiable for the one they thought was odd but did not match my secret answer choice, I did not accept it and responded: **That's correct, but it's not my answer.** Students kept trying other options. If they could not get it after several attempts, I gave them my answer. The words covered any vocabulary area raging from science, to geography, sports, people, colors, countries, and English, and also reflected the interest of the students.

To carry out this activity effectively using IWB and tablets, I received some practical training from the university's technical support staff on how to use the IWB and a technical support staff was present in class on the day of implementation to help with any technical problems that might arise. I paired the students and gave each pair an ipad and explained the learning activity and how it was to be used with the IWB and tablet. I wrote down the first group of words on the IWB and uploaded it on students' Ipads as follows:

Japan, Hong Kong, USA, Germany
Teacher: Which word is the odd one and why?
   Students engaged and collaborated in their pairs to decide which word was odd. When any pair was ready, they circled the odd one out on their iPads, uploaded it on the IWB and justified their answer choice as in the following structure:

Student pair: We think X is the odd one out because…
   In the example above, a student pair said they thought Hong Kong was the odd one out because Hong Kong is a city and the others are countries (Appendix 2). One pair said the USA was odd because USA starts with a vowel while the others don't (Appendix 3). Another pair answered that Hong Kong was odd because the soccer World Cup has never been held in Hong Kong but has been held in the other countries. Some said Japan was odd because Japan is an island nation while the other countries are not. Through scaffolding, I got students to think creatively and be more engaged by sharing information unknown to other pairs. All the above answer choices were correct but because none of them corresponded to my secret answer, I stopped the activity, appreciated their efforts but gave none of the pairs a point. I then wrote my answer on the IWB, uploaded it to students' iPads as follows:

Teacher: Germany is the odd one out, because Disneyland is located in Hong Kong, Japan, and the USA, but it is not located in Germany.

After trying out my example, it was the students' turn to use the IWB. Students took turns in their pairs to come up with any group of 4 words and chose the odd-one-out word with which to challenge their friends. The other pairs had to reason which word was odd, and justify their answer, hoping it will correspond to the pair`s secret answer choice. For example:

Student pair: Peace, math, physics, chemistry
Which word is the odd one out and why?

One pair answered that math was odd because it was abbreviated, but the others were not. Another pair said peace was the odd one out because peace is not a subject in school, but the others are (Appendix 4). Another said chemistry was odd because chemistry is the name of a music group in Japan but others are not. These answers were justifiable, but did not match the pairs' secret answer choice. To each pair they answered: **That's correct, but it is not our answer.** For them, math was odd because nobody has ever won a Nobel Prize for math but people have won for chemistry, physics, and peace (Appendix 5). After each pair took turns with this activity, I asked each pair to vote the most interesting set of words that featured in the activity and to give reasons why they felt so.

As can be observed from the teaching activity employed, the interactive nature of the use of the IWB and tablets provided a physical and emotional outlet for students who are sometimes required to sit through a 90-minutes lecture-style EFL class with very little student output. IWB and tablet technology as implemented through the learning activity described above puts added emphasis on competence in communication and can be a useful tool for teachers who want to depart from the traditional top-down, teacher-centered instruction style that foreign language learners find "boring". As Gee, (2004) points out, learning has become associated with work because it is not usually fun in the school setting. Gee, (2004, cited in Knobel and Lankshear, 2012) discusses fun and literacy in learning in his qualities of affinity spaces:

> Affinity spaces is specially designed spaces (physical and virtual) constructed to resource people [who are] tied together […] by a shared interest or endeavor […] affiliate with others to share knowledge and gain knowledge that is distributed and dispersed across many different people, places […] Affinity spaces instantiate participation, collaboration, distribution and dispersion of expertise and relatedness. These features are integral to the 'ethos stuff' of what we mean by 'new' literacies.

With the rapid developments in digital technologies that can motivate and engage students and teachers alike in new forms of teaching and learning, teachers could encourage their students to associate formal learning with the sort of fun and engagement they find in their out-of-class activities or affinity spaces. According to Gee, (2004), these "passionate affinity" spaces outside

of school and colleges enable students to communicate with friends via social networks, play online games, and build virtual cities in a collaborative online environment. Creativity, collaboration, curiosity, passion, enjoyment, and literacy are at the center of this approach to learning. Students can identify with affinity spaces in the EFL classroom as they learn language, learn about language or learn through language, and develop literacy via classroom learning activities that utilize educational technology like IWBs and tablets. This new shift in learning, Knobel and Lankshear argue, is becoming commonplace:

> Large and growing numbers of people are 'joining' literacies (and devoting impressive amounts of time and energy to them) that differ greatly from mainstream cultural models of literacy of the modern era (and, particularly, of literacies as they are constructed and engaged with in formal educational settings like schools). Much of the 'nature' of this difference is captured in Jim Gee's accounts of learning within affinity spaces (Gee, 2004).

Thus, adopting a learning style in the EFL classroom reminiscent of that seen in affinity spaces will make foreign language learning fun especially as collaboration is key.

6. Conclusion

This study reported the implementation of IWB and tablet personal computers in an EFL class through a language learning activity titled 'the odd one out'. It is worth noting that IWBs and tablets are educational classroom technology tools that are meant to enrich and complement the learning experience, without fully replacing traditional classroom tools like the whiteboard or chalkboard. At the end of the study, students could understand how IWBs and tablet personal computers can be used in an educational setting and some of the benefits that come with their use. This study concludes that IWBs and tablet computers technology can create a collaborative learning environment, enable students to engage with and learn from each other through scaffolding; an important kind of teaching involving tailored guidance by a 'teacher' in which the more capable members share responsibility with the less capable members in the doing of an act, gradually letting them assume greater responsibility (Hall 2012: 49). Finally, IWB and tablet technologies ensure students and teachers find, evaluate, utilize, share and create content using information technology as an effortless leap to developing 21st-century digital literacy skills.

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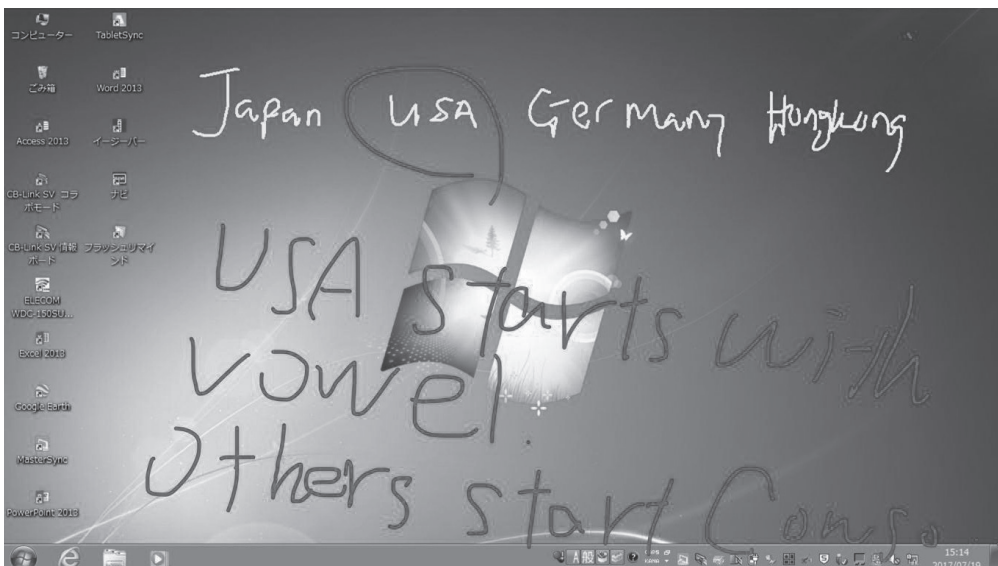
Appendix 1

Item	Procedure	Duration
Preparation (before class)	group of words that reflect learners' interest	30 minutes
Explain lesson goal	Ask for and give reasons using **why...** and **because...** Encourage **collaborative learning scaffold learners' literacy**	3 minutes
Explain the language learning activity	Explain what 'the odd one out' means. Make pairs of students Explain how to use IWB for the activity/ Give out tablets Teacher writes groups 4 words on IWB and upload to tablets Students choose the odd one out and upload to IWB Class discusses the odd one out There is no 'correct' answer. must correspond to the teacher's If answer corresponds to teachers, he answers: That is correct. If it doesn't correspond he answers: Correct but not my answer Students pairs take turns to do the same thing	5 minutes
Questions	Teacher answers any questions students might have	2 minutes
Practice	**Example: Japan, USA, Hong Kong, Germany** Teacher: Which is the odd one out and why? Students in their groups discuss possible answers Write them on their tablets Circle and upload on IWB giving a reason for their answer in the following pattern: Student pairs: We think X is the odd one out because X... Teacher: **That is correct but not my answer or** **That is correct (if the answer matches the teacher's)** Each group tries at least once	10 minutes
Other Examples	Tokyo, Seoul, Melbourne, Rio de Janerio Cucumber, banana, orange, tomato June, July, September, October	15 minutes

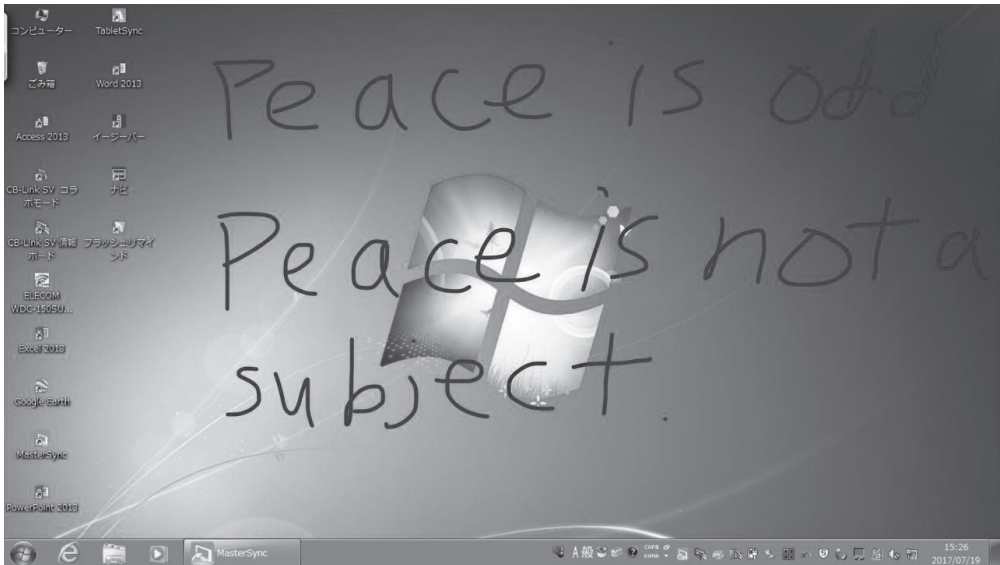| Students' turns | Pairs come up with their own group of words to challenge others like the teacher did | 45 minutes |
| Conclusion | Pairs vote the best group of words and justify why
We think X was the best group of words because… | 10 minutes |

Appendix 2
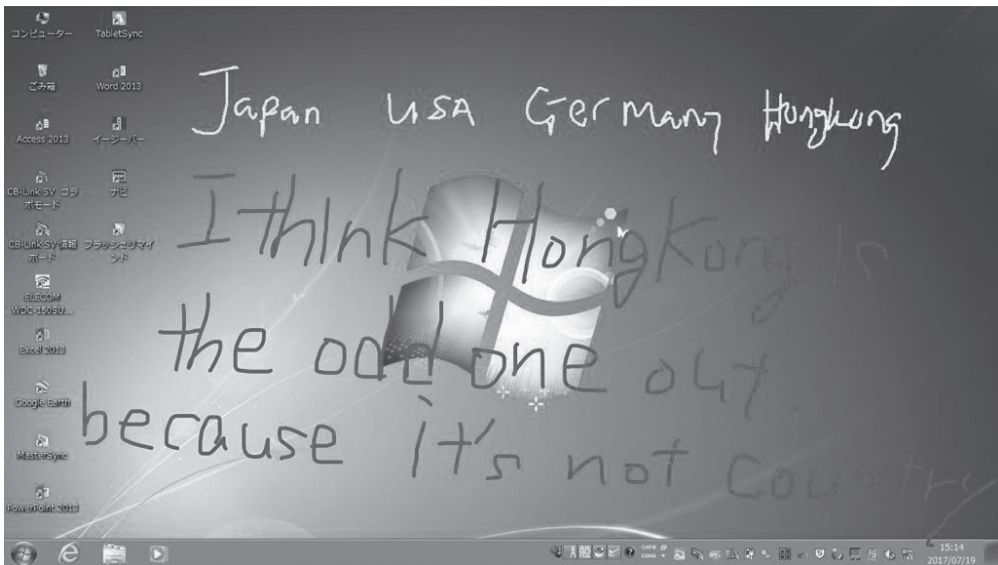
Appendix 3

Appendix 4

Appendix 5