UNDERSTANDING THE EFFECTIVENESS OF TEACHING CHINESE CHARACTERS USING WIIMOTE INTERACTIVE WHITEBOARD ON PRIMARY SCHOOL STUDENTS

TAN KUAN NIEN

05-4506832 pustaka.upsi.edu.my Perpustakaan Tuanku Bainun Kampus Sultan Abdul Jalil Shah PustakaTBainun ptbupsi

THESIS SUBMITTED IN FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF EDUCATION (INSTRUCTIONAL TECHNOLOGY) (MASTER BY RESEARCH)

FAKULTI PENDIDIKAN DAN PEMBANGUNAN MANUSIA
UNIVERSITI PENDIDIKAN SULTAN IDRIS

2018

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ABSTRACT

This study examines the effectiveness of teaching Chinese characters using Wiimote interactive whiteboard on primary school students. The objectives of this study were to investigate the differences in students' achievement and motivation in learning Chinese characters between Wiimote Interactive Whiteboard (Wiimote IWB) and traditional pedagogical practice, and to determine the level and factor of acceptance to use Wiimote IWB to teach and learn Chinese characters based on teachers' perspective. Six teachers and forty-six Year-2 students were chosen as samples for this experiment, who were split into two groups, where the treatment group used the Wiimote IWB in the lesson, while the control group used traditional pedagogy. Pre-tests and post-tests of "listen and write" were conducted and compared using the t-test to investigate the difference in terms of students' achievement between the groups. The students also answered the Motivated Strategies of Learning Questionnaire (MSLQ) to investigate the difference in students' motivation between the groups. Teachers also answered the Interactive Whiteboard Acceptance Scale (IWBAS) questionnaire to find out the level and factor of acceptance of use of Wiimote IWB and interviewed to understand its strengths and weaknesses. The result showed there has no significant difference in the students' achievement and level of motivation between the groups. However, the treatment group's achievement did show significant. Teachers also have a moderate level of acceptance of use of Wiimote IWB, where effort expectancy and social influence are the main factors that affect their acceptance. In conclusion, Wiimote IWB may help to improve certain students' achievement in learning to write Chinese characters. Findings in this research weren't showing Wiimote IWB has significant strength over the traditional method, more samples and further study may unveil more potentials of Wiimote IWB in instructional practice in other subjects. The implication of the study showed teachers should learn to integrate the IWB into the lesson to boost its potential in improving pedagogy.

MEMAHAMI KEBERKESANAN PENGAJARAN PERKATAAN CINA DENGAN PENGGUNAAN PAPAN INTERAKTIF WIIMOTE TERHADAP MURID SEKOLAH RENDAH

ABSTRAK

Kajian ini menguji keberkesanan dalam pengajaran perkataan Bahasa Cina dengan penggunaan papan interaktif Wiimote (Wiimote IWB) dalam kalangan murid-murid sekolah rendah. Objektif kajian ini adalah mengesan perbezaan dalam pencapaian akademik dan motivasi pelajar dalam pembelajaran penulisan perkataan Bahasa Cina di antara kelas yang menggunakan Wiimote IWB dan pedagogi tradisional, serta mengenal pasti tahap penerimaan penggunaan Wiimote IWB dalam pengajaran Bahasa Cina berdasarkan kepada perspektif guru. Seramai enam guru dan 46 murid Tahun 2 telah dipilih sebagai sampel eksperimen dan dibahagikan kepada dua kumpulan, di mana kumpulan rawatan menggunakan Wiimote IWB untuk pengajaran dan pembelajaran, manakala kumpulan kawalan menggunakan pedagogi tradisional. Pra-ujian dan pos-ujian 'dengar dan tulis' telah diadakan dan dibandingkan dengan ujian-t untuk mendapat perbezaan dalam pencapaian murid di antara kumpulan. Soal selidik Strategi Bermotivasi dalam Pembelajaran (MSLQ) juga telah dijawab oleh murid untuk mendapat perbezaan tahap motivasi murid di antara kumpulan. Guru juga telah menjawab soal-selidik Skala Penerimaan Papan Interaktif (IWBAS) untuk memperolehi tahap dan faktor penerimaan, serta bertemu duga untuk mengetahui kekuatan dan kelemahan Wiimote IWB. Dapatan kajian menunjukkan bahawa tiada perbezaan ketara dalam pencapaian murid dan motivasi pembelajaran di antara kumpulan. Namun, terdapat kemajuan ketara dalam pencapaian murid kumpulan rawatan selepas kajian. Kesimpulannya, penggunaan Wiimote IWB dapat membantu meningkatkan pencapaian pelajar tertentu dalam pembelajaran perkataan Cina. Guru pula menunjukkan tahap penerimaan penggunaan Wiimote IWB yang sederhana, dan usaha serta pengaruh sosial merupakan faktor utama kepada penerimaan penggunaannya. Walaupun dapatan kajian ini tidak menunjukkan kebaikan penggunaan Wiimote IWB yang ketara berbanding dengan kaedah tradisional, tetapi bilangan sampel yang lebih ramai dan kajian berterusan dapat mencungkil lebih potensi Wiimote IWB terhadap kaedah instruksional dalam mata pelajaran lain. Implikasinya, guru-guru patut berlatih menggunakan IWB dalam pengajaran supaya dapat menguasai potensinya dalam penyempurnaan pedagogi.

TABLE OF CONTENTS

CHAPTER 2 LITERATURE REVIEW

CHAPTER 3 METHODOLOGY

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CHAPTER 4 DEVELOPMENT OF WIIMOTE IWB AND LESSON

CHAPTER 5 FINDINGS

LIST OF TABLES

05-4506832 pustaka.upsi.edu.my Perpustakaan Tuanku Bainun Kampus Sultan Abdul Jalil Shah PustakaTBainun ptbupsi

LIST OF FIGURES

05-4506832 pustaka.upsi.edu.my Perpustakaan Tuanku Bainun Kampus Sultan Abdul Jalil Shah PustakaTBainun ptbupsi

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION

1.1 Introduction

The integration of Information and Communication Technology (ICT) into pedagogical practice is getting common as the rapid growth in global technology development. Since year 2000, educators and learners around the world started to adapt to the 21st century pedagogical practice, where ICT had been either integrated or becomes an integral part of a classroom lesson. These happened because ICT can deliver media-rich teaching materials learning contents and resources, which is commonly known as courseware that features animation, video, audio, and interactive objects and activities. Since they are interactive, interesting, easily accessed from CD or DVD or the Internet, and accessible on-demand, ICT integrated teaching and learning have become an important step to transform traditional instructional and learning practice into a whole

new level. Teaching and learning no longer happen in one-way output from static blackboard or whiteboard, textbook and exercise book to the learners. Instead, teachers can get media-rich materials on demand and deliver to students, breaking the barrier and limits of the books and making the lesson more fun and interesting, engaging the learning motivation among the learners in the classroom.

As development in science and technology is getting advanced and growing exponentially, education technology development is not exempted from the trend too. More and more educational related tools and products are created to enhance teaching and learning experience, such as interactive whiteboard (IWB), virtual learning environment (VLE), online self-learning module, e-Books and much more. Most instructional tools and technology are intended to improve teaching and learning experience as advertised, but they also created a new competition in the education market. The competition is making many new variations in each kind of instructional tools and solutions. However, their capability and effectiveness in improving teaching and learning are yet to be verified.

As the use of technology in the classroom lesson becomes more popular than the past, therefore evaluating technology as an instructional tool becomes necessary to validate its effectiveness or ineffectiveness in the classroom. (Kulik, 2003) The aim of this thesis is to understand the effectiveness of teaching and learning Chinese characters using Wiimote Interactive Whiteboard (IWB). Many researches had been done on the impact and efficiency of the using IWB in pedagogy, and most of the research shown positive results and effects to both teachers and students. (Levy, 2002; BECTA, 2003;

Beauchamp, 2004; Smith et al., 2005; Higgins et al., 2007; and Murcia & Sheffield, 2010)

This research has a similar approach as what were previously done, however, as a concern on both cost and effectiveness, this will be done by using a "Do-It-Yourself" low-cost IWB using a Wiimote, without the premium software and courseware. Therefore, the features of the DIY IWB may not be as good as the commercial IWB. This research will collect quantitative data to determine the impact of teaching Chinese characters using the low-cost Wiimote IWB on primary school's students.

1.2 Background

Interactive whiteboard (IWB) is currently one of the most advanced teaching aid in the classroom. It is an instructional tool that allows computer images to be displayed on a board using an LCD projector. The teachers can write, draw, manipulate the elements on the screen by using a pen or their finger as a pointing device. Items can be dragged, clicked and copied and teachers can handwrite notes or draw diagrams, and save them for future use. IWB is also the first electronic instructional technology designed primarily for teachers' use (Betcher & Lee, 2009). Many general consumer electronic products, such as radio, television or personal computers, were initially designed for the use in home and office, and then adapted for use in school. IWB technology was conceived specifically with education in mind. Hence many vendors and educators developed many coursewares and instructional tool software for the use of IWB.

The use of chalkboard in the classroom has a long history, and it became the most important and traditional teaching tool for teachers since a century ago. However, there are many limitations of a traditional chalkboard. Chalkboard provides a shared and focused memory for a meeting, allowing flexible placement of text and figure, which complements our human capabilities for manipulating spatial memories. However, the space on the board is limited, and the items on the board must be erased when that space is needed for something else, and rearranging items is very inconvenient when they must be manually redrawn and then erased. Handwriting on a chalkboard can be illegible. Chalkboards are also unreliable for information storage (Stefik, M. et al. 1987).

Therefore, the use of IWB in the classroom is now getting more popular as it can break the limitation of chalkboards. Besides, initial research on the use of IWB in primary and higher education is promising. Studies have documented that both teachers and students are fond of the technology (Beeland, 2002; Smith et al. 2005). The students are more engaged and motivated to learn when IWBs are employed (Beeland, 2002; Smith et al. 2006). Also, many research studies have noted that the use of IWB shifts instruction from presentation to interaction and students' focus shifts away from the teachers to the content, making IWB lessons more student-centered than traditional ones (Cuthell, 2005).

IWB influences students' learning in many ways. It helps to raise the level of student engagement in a classroom, motivates students and promotes enthusiasm for learning. IWB supports different learning styles and has been successfully employed in hearing and visually impaired learning environments. Research also indicates students

can stay concentrate longer during the lesson and can review notes saved from the IWB easily. Also, research also shows that designing lessons around IWBs can help educators streamline their preparation and be more efficient in their ICT integration (SMART, 2004).

The British education authority also made a statement while reviewing the investment made in digital technology in UK schools since the mid-1990s, recognised the adoption of IWB had indeed offered significant and immediate effects and advantages in teaching and learning practice which may not be able to be achieved by other instructional technologies (BECTA, 2007). This fact also convinces that IWB is no just a replacement of traditional chalkboard, but it also has potential to improve teaching and learning experience in the classroom.

In year 1997, the Ministry of Education of Malaysian (MOE) proposed a conceptual blueprint titled "Smart Schools in Malaysia: A Quantum Leap," stated that Malaysia needs to make the critical transition from an industrial economy to a leader in the Information Age. To make this vision a reality, Malaysians need to make a fundamental shift towards a more technologically literate, thinking workforce, able to perform in a global work environment and use the tools available in the Information Age. The education system must undergo a radical transformation to make this shift. The schooling culture must be transformed from one that is memory-based to one that is informed, thinking, creative and caring, through leading-edge technology.

Since then, many schools in Malaysia were introduced to adopt multimedia infrastructure into the classrooms to form "e-classrooms" in the schools. Many schools

have a basic set of multimedia devices in the classrooms, which consist of a desktop or laptop computer, an LCD projector, a pull-down projector screen and speakers. Only a very limited number of schools to have IWB in the classroom. The low implementation of the IWB is due to overpriced hardware, and therefore many teachers do not know its benefits and potentials.

The study on application and effectiveness on teaching Chinese characters using IWB in Malaysia also has not been done so far yet. Therefore, this research may help teachers and educators to have a better understanding of the effectiveness and differences in the comparison between the use of IWB and traditional pedagogy.

1.3 Statement of Problems

Many educators have incorporated technology as an instructional tool to raise student engagement (Boyce et al., 2014; Dell et al., 2016). As students' technological interests and skills change, creating an engaging environment became difficult (Rosen et al., 2010). Educators also must find new tools to engage students and help them learn in ways that work for them and the teachers too (Rosen et al., 2010). Therefore, implementation of IWB into the lesson is one of the ways to create an engaging learning environment in the classroom.

However, the commercial IWBs are too expensive (Ting, 2014; Eriksson & Axelsson, 2014). Hence, many schools could not afford to have one, schools that provide one or more IWBs but they could not make it available in each of every

classroom, especially Chinese primary school. A Chinese primary school in Malaysia is a national-type public school that is partially subsidised by the government. Therefore, certain utilities are sponsored by the Board of Directors and Parents and Teachers Association. Hence, some Chinese primary schools, particularly in rural areas, may not afford to have an expensive commercial interactive whiteboard. Therefore, teachers are not able to use them due to the unavailability. The cost of setting up an e-classroom containing a desktop computer, an LCD projector and an interactive whiteboard is approximately RM8000, and above, about half of the cost is just to purchase an IWB.

Due to the above statement, a Wiimote IWB has been developed to test the effectiveness of teaching and learning in the classroom. Besides, the cost of the IWB, the impact of teaching Chinese characters using IWB on students has not been much research done so far (Xu, 2011). Besides, the acceptance and effectiveness of Wiimote IWB in the context of pedagogy also has not been much research done too. Most previous studies and researches were using a commercial IWB in pedagogical practice in core subjects such as science and mathematics, English art, and many were involving preschool and higher institution participants. Furthermore, the study on the acceptance of IWB also has not been done much in the Malaysian schools' context. As IWB are proven to be effective in teaching (Levy, 2002; Becta, 2004; Smith et al., 2005), however it is unknown whether IWB is effective in teaching Chinese characters too.

Based on a survey done by the researcher, many Chinese primary school teachers in Malaysia are found rarely teaching using IWB in class too. This is because due to lack of facilities, and some are because teachers think it is inconvenient. They must turn on the computer and wait for the software to launched before use, thus

wasting time. Meanwhile, chalk and blackboard can be use instantly, and usability is more familiar and comfortable. According to Beauchamp et al. (2010), the value of creative and improvised elements in the classroom is thus not managed well enough. Teachers' lack of knowledge of the features and potential of IWB and occasionally technical difficulties avoided them to deliver the lesson with the aid of IWB too (Al-Faki & Khamis, 2014).

However, based on the literature reviews on the contribution of IWB in teaching and learning, many contradictions in the findings. In Guðmundsdóttir's study (2014), findings show that the use of IWBs does not exhibit significant improvement in collaboration, communication, or interaction between students (Beauchamp & Kennewell, 2013; Blau, 2011). Türel & Johnson (2012) also found the use of IWB in the classroom is still a teacher-centred, whole-class approach teaching practice, just as the traditional pedagogy practice. Indeed, so far, the IWB is mainly located in teacher territory rather than being in the student domain. Furthermore, studies by Beauchamp and Kennewell (2013) noted that the initiation of an IWB increases the amount of classroom instruction and one-way communication from teacher to student Also, the interaction between the teacher and students remains very traditional and is not so much characterised by interactivity (Beauchamp et al., 2010; Hennessy, 2011). Therefore, a study has to be done to determine whether there has significant difference between teaching and learning Chinese characters with IWB and the traditional pedagogical teaching practice by using chalkboard.

Congruent with those findings, the aim of this study is to understand the effectiveness of teaching Chinese characters using Wiimote is necessary and to determine the strengths and weaknesses of Wiimote IWB.

1.4 Research Objectives

The purposes of this research are to develop and investigate the effectiveness of teaching and learning Chinese characters using a low-cost Wiimote interactive whiteboard on students. The specific objectives of this research are listed as follow:

1. To investigate the differences in students' achievement in between learning Chinese characters using Wiimote Interactive Whiteboard and traditional pedagogical practice.
2. To investigate the differences in students' motivation in between learning Chinese characters using Wiimote Interactive Whiteboard and traditional pedagogical practice.
3. To determine the level of teachers' acceptance to use Wiimote Interactive Whiteboard for teaching.
4. To determine the factors influencing teacher's acceptance to use Wiimote Interactive Whiteboard for teaching.
5. To determine the strengths and weaknesses of Wiimote Interactive Whiteboard.

1.5 Research Questions

The following are the questions will be discussed in this research:

1. What are the differences in students' achievement in between learning Chinese characters using Wiimote IWB and traditional pedagogical practice?
2. What are the differences in students' motivation in between learning Chinese characters using Wiimote IWB and traditional pedagogical practice?
3. What are the level of teachers' acceptance to use a Wiimote IWB for teaching?
4. What are the factors of teachers' acceptance to use a Wiimote IWB for teaching?
5. What are the strengths and weaknesses of Wiimote Interactive Whiteboard?

1.6 Research Hypothesis

H1) The use of Wiimote IWB shows a significant difference in students' achievement in learning Chinese characters by comparison with traditional pedagogy.

H2) The use of Wiimote IWB exhibits a significant difference in students' motivation in learning Chinese characters by comparison with traditional pedagogy.

H3) Teachers have a high level of acceptance and use of Wiimote IWB in teaching Chinese characters.

1.7 Conceptual Framework

This aim of this research is to examine the impact of the use of Wiimote IWB on teaching the Chinese language in the primary school. The outcome and the findings in the investigation will be acquired by a comparison between the teaching using Wiimote IWB and without Wiimote IWB, via a quantitative and qualitative survey on both teachers' and students' perspective. Figure 1.1 shows a conceptual framework of this research.

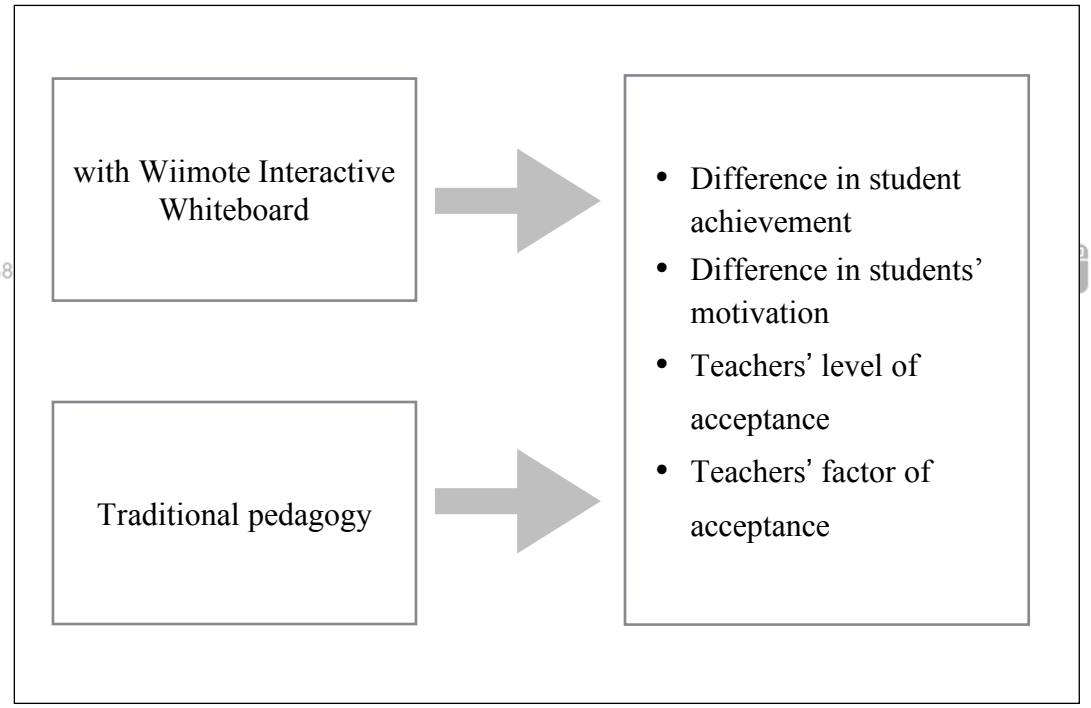

Figure 1.1. Conceptual framework

1.8 Significance of Study

Many scholars and educators found that the use of IWB has delivered many positive effects on learning and advantages for pedagogical practice. (Beauchamp, 2004; Smith et al., 2005; Hennessy et al., 2007; White 2007; Higgins et al., 2007; Preston & Mowbrary 2008; Murcia, 2008a, 2008b; and Murcia & Sheffield, 2010) However, in Malaysia has only a little research on the impact of the use of IWB in Malaysian schools (Jamaludin et al., 2005, Wong et al., 2013) that consider their use and to explore pedagogical manner needed to enhance students learning whereas interactivity requires a new approach to pedagogy.

Besides, the effectiveness of teaching using a Wiimote IWB and teaching Chinese language using an IWB have not been much research done so far too (Xu, 2011). Most previous studies and researches regarding the use of IWB in pedagogical practice are commonly done by in the context of preschool, science and mathematics, English language and higher institution study. Therefore, this study is intended to study how IWB effects in teaching Chinese characters. Even though IWB is known to support in any subject fully, but the outcome and effectiveness may vary. Furthermore, although studies have been conducted previously, they were using a commercial IWB, which is complete in the package and very expensive (Ting, 2014; Eriksson & Axelsson, 2014). Therefore, the findings may vary and not adequately reflect the use Wiimote IWB in teaching and learning. Furthermore, Wiimote IWB does not bundle with any software, however, with the increasing popularity of touch-based devices and hardware, recently computer operating systems are having built-in and better handwriting recognition input method for multilingual input, thus supporting the Wiimote IWB for handwriting-