DEVELOPMENT AND EVALUATION OF AN ORAL PRESENTATION MODULE USING INTERACTIVE WHITE BOARD FOR FOUNDATION STUDENTS

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STUDENTS

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ABSTRACT

The purpose of this study was to develop and evaluate an oral presentation module in a foundation classroom. This module was implemented for students from a foundation programme in a selected private higher education in the Klang Valley. A development research method based on ADDIE's model was selected. This technique was divided into with three phase's needs analysis, design and development and implementation and evaluation. Data from the needs analysis phase was mainly from a survey done by students and a semi-structured interview involving the Programme Director and a lecturer, while the second and the third phase was done concurrently. In the second phase, interviews were carried out with experts and for the third phase, the implementation and evaluation phase, data was gathered from surveys and interviews involving students who have used the Interactive White Board as a presentation tool.In the first phase, the needs analysis included a survey of technology usage of 145 students from a foundation programme in a selected private higher learning institution in the Klang Valley. The findings indicated the respondents perceived themselves to be skilled in the usage of computers. A large number of students were familiar with the usage of power point slides as a presentation tool and some were already familiar with the usage of Interactive White Board. The participants believed that Interactive White Board was important for the teaching and learning process in the English classroom in particular to be used an interactive presentation tool. In addition to that, the interview findings have revealed that these students will be able to produce an engaging presentation using the Interactive White Board if proper guidance and training were given to these students. From the findings of the first phase, an interactive presentation module was developed. In the second phase of design and development, the interactive presentation module was

designed based on Kristaf and Saftan's (1995) interactive learning system which can be divided into three areas namely information design, interaction design and presentation design. A constructivist method was used with the interactive presentation module for the delivery of the classroom resources in the design process. A group of five experts were selected for this phase. Two of them were experts in instructional technology and the other three were English language lecturers who were the subject matter experts. These experts highlighted issues based on information design, presentation design and interactive design. Findings obtained from the experts reveal that module was interesting, appealing and supports interactive presentation. In the third phase, which is implementation and evaluation phase were carried out. During the implementation stage, the researcher was the coordinator of the module. Data was collected from surveys done by the students from both groups namely the dependent (presentation with Powerpoint) and the independent group (presentation with Interactive White Board) and an interview with a group of 10 foundation students who had used the Interactive White Board to conduct an interactive presentation. The data was gathered to analyse the student's perception on using the Interactive White Board as a presentation tool and the compare students 'achievements. Based on the findings, it is suggested that an oral presentation module using Interactive White Board could be used for learning of English, as well as other subjects.

Keywords: Module development and evaluation, Interactive White Board and technology integration in classrooms.

PEMBANGUNAN DAN PENILAIAN MODUL PEMBENTANGAN LISAN DENGAN MENGGUNAKAN PAPAN INTERAKTIF UNTUK PELAJAR ASASI

ABSTRAK

Tujuan kajian ini ialah untuk membangun dan menilai sebuah modul pengajaran untuk program asasi. Modul ini telah diimplimentasikan di kalangan pelajar dari program asasi yang telah dipilih daripada salah sebuah institusi pengajian tinggi swasta di Lembah Klang. Kaedah pembangunan yang dilaksanakan adalah berlandaskan model ADDIE. Kaedah ini in dibahagikan kepada tiga fasa iaitu analisis keperluan, reka bentuk dan pembangunan dan implementasi dan penilaian. Data dari fasa analisis keperluan adalah dari tinjauan daripada pelajar dan tembual dengan Direktor Program dan seorang pensyarah, manakala untuk fasa kedua dan ketiga dijalankan seiring. Data untuk fasa kedua melibatkan pakar. Fasa ketiga, data diambil daripada tinjauan dan temubual melibatkan pelajar yang telah melakukan pembentagan lisan dengan mengunakan Papan Interaktif. Untuk fasa pertama, keperluan analisis melibatkan tinjauan pengunaan teknologi dikalangan 145 pelajar dari program asasi yang telah dipilih dari salah satu institusi pengajian tinggi swasta di Lembah Klang. Dapatan kajian menunjukkan bahawa para pelajar berpendapat bahawa mereka mahir dengan pengunaan komputer dan sudah biasa dengan pengunaan "Power Point" untuk pembentangan lisan dan sebahagian pelajar telah menyatakan bahawa mereka sudah boleh mengunakan Papan Interaktif. Para responden pula berpendapat bahawa Papan Interaktif ini penting untuk digunakan sebagai bahan pengajaran dan pembelajaran di dalam kelas terutama untuk pembelajaran Bahasa Ingerris untuk digunakan sebagai alat untuk megalakkan pembentangan lisan secara interaktif. Selain itu, dapatan daripada temubual menyarankan bahawa pelajar –pelajar ini boleh meghasilkan satu pembentangan lisan yang interaktif dan menarik perhatian jika mereka diberi galakan dan lalithan tentang penggunaan Papan Interaktif. Dari dapatan

fasa pertama, interaktif modul untuk pembentangan secara lisan telah direka.Dalam fasa kedua, iaitu fasa reka bentuk dan pembangunan, modul ini direka berasaskan Kristaf dan Satran (1995) yang bertumpu kepada kaedah rekabentuk interaktif yang berfokus kepada tiga aspek rekabentuk iaitu informasi, interaktif dan persembahan. Selain itu juga, kaedah konstruktivisme digunakan untuk pembanguanan modul ini. Sekumpulan pakar yang terdiri daripada lima orang telah dipilih untuk fasa ini. Dua orang pakar adalah pakar dalam reka bentuk pengajaran manakala tiga lagi pakar adalah daripada pensyarah Bahasa Inggeris adalah pakar dalam isi kandungan Bahasa Inggeris. Pakar – pakar yang telah dipilih memberi pandangan mereka tentang isu – isu bekaitan reka bentuk informasi, interaktif dan persembahan. Dapatan dari pakar –pakar tentang modul ini ialah ianya menarik perhatian, memberangsankan dan mengalakan pembentangan lisan secara interaktif. Dalam fasa ketiga, iaitu fasa implimentasi dan penilaian telah dijalankan. Semasa fasa implimentasi, penyelidik berperanan sebagai kordinator untuk modul pembentangan lisan ini. Data dikumpul melalui kaedah tinjauan dari dua kumpulan pelajar iaitu satu kumpulan yang telah menggunakan "power point slide" untuk membentangan lisan, manakala sebuah kumpulan lain adalah telah menggunakan Papan Interaktif sebagai alat bantu belajar untuk melakukan pembentangan lisan. Selain itu, satu temubual telah dijalankan dengan 10 pelajar asasi dari kumpulan ini. Data yang dikumpul adalah untuk menganalisis pendapat pelajar tentang penggunaan papan. interaktif untuk pembentangan lisan dan perbandingan pencapaian pelajar dikalangan dua kumpulan ini. Berdasarkan dapatan kajian, adalah dicadangkan bahawa modul pembentanga lisan yang digunakan Papan Interaktif amat sesuai untuk pembelajaran Bahasa Inggeris dan matapelajaran lain.

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CONTENTS

Chapter 1 Introduction

Chapter 3 Methodology

Chapter 4 Research Findings

Chapter 5 Discussion and Conclusion

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF SYMBOLS AND ABBREVIATIONS

IWB	Interactive White Board
PPT	Power point Persentation
MKO	More knowledgeable other
TPACK	Technology Pedagogy and Content Knowledge
ZPD	Zone of proximal development
ISTE	International Society for Technology in Education
ESP	English for Specific Purposes

CHAPTER 1 INTRODUCTION

Background of the study

In the last twenty years, the rate of technological progress was comparable to the entire 20th century; however, in the field of education technology, the numbers have dawdled unusually behind as cited by Prensky, 2007. Teachers will be the key element to the success of the Smart school (Claire, 2003). It denotes that teachers will have to be very computer literate, capable of using electronic mail (email) and surfing the Internet to find materials for their lesson. Hence their phobia and anxiety have to be removed. According to Gagne (1985) teachers are suitable human models to stimulate alteration in attitudes. Apart from that, teachers need to demonstrate positive attitudes towards ICT and possess low computer anxiety.

Russell and Haney (2000) stated that computer integration in classrooms is on the rise but the education industry has been much slower than society at large in adopting new technologies. In many classrooms, the commonly used instructional tools continue to be the board and the overhead projector. New technology and applications have ensued in various fields namely government, industry, finance, military, healthcare, and more. Despite the education ministry's goal requiring the inclusion of technology into pedagogical approaches, educators continue to procrastinate with the incorporation of technology into instruction rather than being at the forefront of emerging technology applications.

There are several factors for this struggle, such as cost, adapting innovations to the educational setting, phobia and anxiety among teachers to change, and lack of leadership at the administrative level as suggested by Basilicato (2005).

Additionally, a study done by Roach (2010) had indicated that the reasons for educators to be unwilling to introduce new technologies in their classrooms are lack of positive attitude, training and support. Prensky (2007) highlighted that "In general, students are learning, adopting, and using technology at a much more rapid pace than their teachers, and many teachers are highly fearful of the technologies that the students take for granted".

This absence of attentiveness may be due to teacher reservations to the integration of technology in the classroom, and many may also curtail from their inner teacher beliefs that traditional pedagogical approaches are definitely best practices. Hsu (2010) had suggested that technology has given rise to the information and digital ages and has rapidly expanded communication to the global level. Therefore, it is pertinent that educators incorporate various technologies into their classrooms to influence students and to stay relevant in a changing society.

In order to participate fully in the 21st-century information-based society, students today must be prepared with technological knowledge, understanding, and skills. Technology standards also require that teachers use educational technologies professionally. Technological educational goals generally include two components: a focus on computer literacy, and on the improvement of instruction. According to Gillman (1989) "Educational technology has the power to enhance the instructional program, to improve student academic performance, and to provide effective and efficient classroom, school, and administrative systems" (p. 16).

According to Morgan (2008), The International Society for Technology in Education (ISTE) has published a list of technology standards which provide a framework on which states have built their technology standards.

The ISTE Technology Foundation Standards for Students include six areas of competence: basic operations and concepts; social, ethical, and human issues; technology productivity tools; technology communication tools; technology research tools; and, technology problem-solving and decision-making tools. These standards are replicated in some way in most of the state technology standards of learning.

In most classrooms, technology use takes the form of an "add-on" approach to instruction because many teachers are unwilling or have negative attitudes to integrate technology in the classroom as cited by Kopcha (2012) who had conducted a study on teacher's perception on the usefulness of technology integration in the classroom. Furthermore, due to lack of exposure to an integration of technology in the classroom, many teachers lack confidence in using or implementing computer use as they feel it is not worthy of their effort and time, to become competent technology (Alexiou-Ray, Wilson, Wright and Peirano, 2003).

Learning to use technology is an area of cultivating enactment and knowledge by generating, and handling the technological process and resources (Lowenthal & Wilson, 2010). Technologies that are integrated into the learning surroundings are stated to as instructional technologies. A pertinent part of the Instructional Technology field is to acquire the influence technology can have on instruction and knowledge construction. This is essential because the amount of instructional technology and teaching materials that is available in the has increased drastically over the years (Parkerson & Parkerson, 2001).

In certain situation, a teacher can have a conducive learning environment equipped with the Interactive White Board, a projector, interactive student response systems, and a wireless tablet that can be used to monitor the learning process from

across the room. Moreover, instructional technology encourages a teacher to shift the teaching style to a more student-centered teaching environment through the use of technology that allows students to interact and visually represent information in real-time (Beach, 2012).

On the contrary, several educators only utilize an overhead projector with slides and continue to manage their instructional classrooms in traditional teacher-centered activities (Peck, Cuban, & Kirkpatrick, 2002).It is noteworthy not only to pay attention to the existence of instructional technology in classrooms but to other aspects like the capability of educators to efficiently use these technologies is equally important as there are many teachers who have not have gone through training related to pedagogical use of these devices. Examples of instructional technologies are like interactive whiteboards, I pad and clickers commonly used for interactive student response systems, are widely used in the last six years due to available funding. Many universities are moving forward and are starting to train their preservice teachers on appropriate instructional technologies by integrating interactive tools to promote student-centered teaching pedagogy such as the use interactive whiteboards to enhance the curriculum (Beach, 2012).

Educational technology at present is beyond the use of classroom computers; it also includes a much wider range of tools to heighten teaching and learning approaches as mentioned by What is Assistive Technology (2012). With the school's support and training, technology can become an integral instructional resource. Technology can be integrated into the various teaching styles. For instance, the Interactive Whiteboard is an appliance, favoring as a visual presenter and interactive teaching aid for use in multimedia instruction (Turel and Johnson, 2012).

The interactive whiteboard also allows for student participation which is not offered by other presentation modes such as chalkboard or overhead projector or screen as suggested by   Interactive whiteboards are a relatively simple new type of technology that teachers can use in the classroom as instructional aids which can improve the learning environment by engaging students in the instruction (Turel, 2010 & British Educational Communications and Technology Agency (BECTA, 2003).

Another added feature of Interactive White Board (IWB) is that the teaching is aimed   at usage for the whole class instruction. Furthermore, these boards allow students to be interactive with each other, the teacher, and the board utilizing visual, verbal, and tactile modalities (Isman,et al., 2012).They can also incorporate a range of   multimedia and other digital resources to enhance content; support interactive and collaborative learning; and, foster student control of learning. Best practice literature supports interactive learning to engage students and to encourage higher order thinking and problem-solving skills (Winzenried , Dalgarno and Tinkler , 2010).

The interactive presentation is gaining popularity in many fields including in the field of Architecture. For instance, Case (2012) had mentioned that English for architects is perhaps the most neglected kind of ESP (English for Specific Purposes). Architects need English for various reasons such as for verbal presentations and written essays. Competence in the English language often becomes as a decisive factor in securing a well-paid job (Casale & Posel, 2011; Davila & Mora, 2000; Dustmann & Fabbri, 2003).

In addition to that, Pottie, K, et al. (2008) advocate that language skills are crucial to meet employment requirements. In the new millennium, architects have to face new challenges whereby they are expected to be more versatile and equip themselves with

language and soft skills (Inman, 2006; Esa Samada, 2000). Toscu (2013) cited that Interactive White Board (IWB) supports presentational approach to learning in a higher learning institution in particular in English language classrooms. Hennessy (2011) highlighted that IWB can influence the audience and engage the whole classroom as IWB is used as a discussion tool during the delivery of a lesson or used for presentation. Furthermore, it allows for good grasp of materials and supports a good classroom control at the same time.

Socio demographic background of students was found significantly influence the proficiency and academic performance especially in English language (Martirosyan, Hwang & Wanjohi, 2015). Usage of technology may aid specific group population to perform better in academic especially for those with lower performance in writing and reading (Ramberg, 2015). Rashid & Asghar 2016 found that usage of media and technology for the purpose of teaching has significantly improved performance of students from weak to moderate. Similarly, media usage as teaching tool was identified as effective tool among primary school students compared to the secondary or tertiary school students. This highlighted that technology usage is very effective in early education (Voogt et al, 2017).

Technology usage has shown different effects in different subjects (Ramberg, 2015). A study found that males performed better in economic and business studies after introduce advance technology usage in classroom for teaching, presentation and communication. On the other hand, females performed at excellent level in science and mathematics. However, there is no significant association was observed between the gender and efficiency of technology used as well as with overall performance (Thiele, Singleton, Pope & Stanistreet, 2016).

However, most of other studies found that the gender differences are insignificant for most subjects, small to medium for a several subjects, and quite equal between both genders (Thiele et al., 2016; Hawi & Samaha, 2016; Buser, Niederle & Oosterbeek, 2014). There is no strong evidence to indicate that the dominance of one gender in the performace of students. Some study found that the mean difference in performance across all subjects is almost zero (Cotton, D.R.E, Joyner, George & Cotton, 2016). The familiar mathematics and science advantage towards female students was found to be quite small, significantly smaller than 30 years ago (Hyde, 2016; Chipman, Brush & Wilson, 2014). At the same time, females were found proficient in language usage and the trend remained the same over that time frame (Lai, 2015). Therefore, these studies indicate the integration of technology revealed no significant effect across the gender.

Studies have identified the mediating factors of the association between gender and academic performance after technology usage. Age was identified as confounding factor between the two variables, as usage of technology shows changes in academic performance as students grew older and moved to higher grades (Strand, 2014). Besides that, interests and out-of-school activities of a student play important role in determining the differences in performance based on the gender (Dierks, Höffler, Blankenburg, Peters & Parchmann, 2016). This suggests that there are multiple factors influencing the effect of technology usage on their performance between males and females.

The language background of Malaysians is very much tied up with the historical and education background of the country (Terpstra Tong & Ahmad, 2018). As Malaysia has various ethnic groups and language usage, the population varies significantly in the usage of language at home (How, S. Y., Heng, & Abdullah, 2015). However, Malay language and English were commonly used in all higher learning institutions. Since

Malaysians come from different culture background, English language continues to be taught as a compulsory language in schools despite the evolution of the Malaysian education system (Martirosyan, Hwang & Wanjohi, 2015). Technology assisted communicative language teaching is an approach to engage learners in interaction and meaningful communication. However, differences between the school and university classrooms differentiate the language learning process. Language learners who still have to learn English in universities need to develop a positive attitude for meaningful learning to occur. In order to achieve this, the teaching and learning process should be interactive and attractive to boost the motivation of the students (Chun, Kern & Smith, 2016).

Currently teachers use technology, it is primarily for routine tasks. Students write essays using word processors, practice math problems using simplistic software, or use the Internet to do web-based research. Teachers use computers to record grades, prepare lessons, and read email (Gil-Flores, Rodríguez-Santero, & Torres-Gordillo, 2017). However to what extend the usage of new technology enhance the skills, presentation and proficiency of a student is still unknown. This study was conducted to evaluate the effectiveness of technology usage in classroom especially in tertiary education system.

Problem Statement

Kopcha (2012) mentioned in his study that a teacher's perception about purpose and challenges related to integrating technology strongly depends on its usage. He further reiterated that teacher's level of confidence on technology integration increased when they were exposed to mentoring and relevant training which led to a more positive outlook towards the usage of technology in classrooms.

Nevertheless, Türel (2011) highlighted that using the Interactive Whiteboard in classroom instruction will increase students enthusiasm to learn if it is carried out in a traditional classroom approach. Besides, the interactive whiteboard also creates a hands-on opportunity with multimedia expedients (Smart Technologies Inc., 2006). Therefore such pedagogical approach enhances student interaction as well as group learning (Beeland, 2002). Norrizan Razali, (2002) stated that the smart teaching and learning concepts would feature the students' abilities to get the information themselves.

Furthermore, Jamerson (2002) reiterated that using Interactive Whiteboard as a teaching instrument will multiply students' motivation to learn through collaborative teaching and learning in a classroom. Nonetheless, the main idea for using the Interactive Whiteboard in a classroom is to offer substantial hands-on opportunities to work with multimedia expedients (Smart Technologies Inc., 2004).

Therefore, it advocates interaction among students; regardless in teacher-directed or group-based learning, thus creating experiential learning, which concurs with. Apart from that, a module will not be effective without a proper pedagogical aspect and instructional design (Islam, K. A., 2015). Moreover, Lowenthal and Wilson (2010) mentioned that the smartness of an instruction depends on how far the teacher or instructors conform to pedagogical, psychological and technology in the process of delivering knowledge in order to generate an intellectual student.

According to Missildine, Fountain, Summers, and Gosselin (2013) who highlighted that moving from a traditional classroom practice to a blended learning environment have shown an increase in student performance. This study focuses on a quasi-experiment approach done in a nursing school with three learning approaches which are traditional lecture only, lecture and lecture capture and flipped classroom

approaches. The current focus is on flipped classroom approaches with blending various technology integrated related activities have revealed that there is an improvement in student performance as opposed two other techniques. However, the study also cited that there is a lack in satisfaction even though there is an increase in student achievement.

On the whole, the many studies related to integration of the Interactive White Board has focused on overall technology use in the education systems, and little attention has been given to the process that teachers utilize when implementing new instructional technologies into their classrooms especially the evaluation of the usefulness of the Interactive White Board in classroom (Zittle, 2004). Apart from that, Harris, Mishra and Koehler (2009) have revealed that a multifaceted interplay occurs between the combination of precise instructional technologies and their related applications in classrooms.

Moreover, there is a gap in the research when looking at teachers who did not obtain formal training in incorporating technology into their syllabus, and how they go about acquiring knowledge realistically in developing and integrating the use of Interactive White Board as a presentation tool to promote interactive learning approaches in the classroom.

According to Schmid (2006) who conducted a study on the usage of Interactive Whiteboards through the lens of the critical theory of technology by suggesting that technology's usage must be deliberated to be the product of the technology's design and the way it is carried out. In conclusion, to see the influence of technology may only be assumed after taking into consideration the purpose of the device, the acceptance and beliefs of the teacher, the approaches the teacher takes to integrate the device, the attitude of the students, and the environment in which the technology is being integrated.

Development of an interactive module using the Interactive White Board as a presentation tool in a foundation classroom is relatively a new area of research in Malaysia. This study will contribute to the body of knowledge of educational technology and interactive verbal communication instructions in private higher learning institutions. The interactive presentation module is developed based on ADDIE's model and the social constructivist learning theory is used to design instruction.

To comprehend the impact of technology in the classroom, teachers do not have to pay emphasis only on the technology, but the content and pedagogy as well. In addition to that, students' perception and assessment of performance were taken into consideration to assess the effectiveness of the module. Hence, there is a necessity to develop appropriate pedagogical guidance specifically for technology integrated modules, in particular, the usage of the Interactive White Board as a presentation tool in a foundation classroom to encourage teachers to use the Interactive Whiteboard as a presentation tool in their classrooms.

According to the Women's Foundation (2006), few studies examined gender relevant research in various fields. It also appears that no studies have examined these gender differences in the perception of technology usage in the classroom especially in higher education in Malaysia. Since Malaysia has various ethnic groups, the students have different levels of English proficiencies as multiple languages were used to communicate; therefore, the perception of students in using technology in the classroom may vary too.

Research Objectives

This research emphasizes on the development research approach which is a type of design-based research to create understanding for a precise setting and to resolve a necessity or a problem (Richey & Klein, 2014). This type of research produces data through models and ideologies subsequent to the process of analysis, design, development and implementation and evaluation (Wang & Hannfin, 2005, Dewitt, 2010). In this study, a model for interactive presentation is developed using the Interactive White Board, and the principles for the implementation of interactive presentations will be restated. This study will be divided into three phases: the analysis phase; the design and development phase; and the evaluation phase.

Therefore, the objectives of each phase are as follows:

Needs Analysis Phase: The first step in determining the needs for the development of integration of IWB as a presentation tool in a foundation classroom is:

1. To explain the conditions of using technology for presentation in the context of the study in the following areas:

   a. the opinion of the level of technology (ICT) skills.

   b. the frequency of use of the Interactive White Board that the students have access to.

      i. To express their opinion of the use of Power Point slides and Interactive White Board in teaching and learning in the context of the study.

      ii. To explore the needs and the problems in the current implementation of classroom presentation from the point of view of the Programme Director and a lecturer.

Design and Development Phase: The second and third phases involve the design and development process of the module according to the themes obtained from the needs analysis phase and expert's opinion.

1. To determine relevant processes or criteria that need to be incorporated into the design of the module integrating IWB as a presentation tool based on expert's opinion.

2. To explore the expert's opinion and instructor's opinion on the initial phase of the development of this module.

Implementation and Evaluation Phase: In this phase, the module prototype which is developed from the second phase will be implemented. Usability of the module will then be evaluated after the module implementation.

1. To explore a difference in perception among students in using PowerPoint slides and Interactive White Board in the following area

a.   Gender

b.   Ethnicity

c.   Proficiency level in speaking and writing

2.   To explore the perception of students on the usability and conduct a comparative study of the module on integrating IWB as a presentation tool in a foundation classroom among foundation students.

3. To examine and evaluate by conducting a comparative study on student's performance of integrating IWB as a presentation tool in a foundation classroom.

4. To examine and evaluate by conducting a comparative study on the effectiveness of integrating IWB as a presentation tool in a foundation classroom.

Research Questions

The major research questions are according to the different phases discussed in the research objectives as follows:

Needs Analysis Phase: 1.What is the situation of using technology among students for the context of the study in the following areas:

    a. The level of technology (ICT) skills?

    b. Student's access to the usage of Interactive White Board?

    c. The frequency of use of the Interactive White Board as a presentation tool.

 2 .What are the current needs of the teachers during a presentation session in a

    foundation classroom?

3. What are the problems faced in the current implementation among the teachers during

   a presentation session in a foundation classroom?

Design and Development Phase: 1.What are the methods or criterion entailed in the designing phase of an Interactive White Board module?

    a. What are the processes involved in designing the module using the Interactive

      Whiteboard?

    b. What are the opinions of the experts with regards to the design of this module

      using the Interactive whiteboard?

Implementation and Evaluation phase: 1.Is there a difference in perception among students in using Power Point slides and Interactive White Board in the following area?

    a. Gender

    b. Ethnicity

    c. Proficiency level in speaking and writing

2. Is there a difference in performance among students in using PowerPoint slides and

Interactive White Board?

3. Does the usage of Interactive White Board improve the overall perception of presentation skills in comparison to the conventional PowerPoint presentation method?

4. What are the opinions of the students using this module with the Interactive White Board in a language classroom?

Research Hypotheses: Implementation and Evaluation Phase

H1:   There is a significant difference in perception among students in using PPT and IWB across the gender, ethnicity and proficiency level for speaking and writing.

    H0:   There is no significant difference in perception among students in using PPT and IWB across the gender, ethnicity and proficiency level for speaking and writing.

H2:   There is a significant difference in the effectiveness of integrating IWB as a presentation tool in a foundation classroom between PPT and IWB group

    H0:   There is a significant difference in the effectiveness of integrating IWB as a presentation tool in a foundation classroom between PPT and IWB group.

H3:   There is a significant difference in the student's performance after integrating IWB as a presentation tool in a foundation classroom between PPT and IWB group.

    H0:   There is a significant difference in the student's performance after integrating IWB as a presentation tool in a foundation classroom between PPT and IWB group.

H4   There is a significant difference in the perception of students on the usability and conduct a comparative study of the module on integrating IWB as a presentation tool in a foundation classroom between PPT and IWB group.

H0:   There is a significant difference in the perception of students on the usability and conduct a comparative study of the module on integrating IWB as a presentation tool in a foundation classroom between PPT and IWB group.

Purpose of the study

The purpose of this study is to focus on the development of a module that integrates the use of Interactive Whiteboard and at the same time, determine how foundation lecturers without prior experience in using Interactive White Boards begin using and integrating it in their classroom for practices using information from subject matter and technical experts based on expert's opinion on interactive presentation skills with the Interactive White Board. In addition to that, this development process would be documented according to phases of analysis, design and development, and implementation and evaluation. The data gathered from the analysis of individual phases would be noted down.

Rationale of the study

There is a lack of research undertaken in Malaysia that examines the processes involved in the integration of technology in particular the integration of the Interactive White Board as a presentation tool in a foundation classroom in a private higher learning institution in Malaysia and the exposure to interactive learning in relation to the teaching and learning of English. Therefore, in order to keep up with the evolution of the use of

16

technology in classrooms, the country needs to transform and adopt new presentation approaches such as using Interactive White Board as a presentation tool in foundation classrooms. There is a dire need in Malaysia to develop guidelines on module development to be used by educators or instructional technologist in order to promote the integration of technology, in particular, the Interactive White Board (Tanner, Jones, Kennwell and Beauchamp, 2005).

Significance of the Study

The importance of this study is to view practical values and its contribution to the pedagogical body of knowledge in technology utilization in terms of its appropriateness of integrating the Interactive White Board to enhance visual presentation as a requisite for 21st-century skills such as communication or presentation tools. The interactive whiteboard is one type of technology that can be successfully integrated into all higher learning institutions. Lately, however, interactive whiteboards are not widely used for regular classroom instruction. To date, there have been few studies conducted regarding Interactive Whiteboard use and its effects on student engagement and behavior in higher learning institutions in particular in Architecture classrooms.

Policy makers in this private higher learning institution will be able to determine whether the usage of the Interactive Whiteboard in a foundation classroom is suitable to be used for teaching and learning and are able to decide on the needs and problems faced during the implementation stage. In addition to that, this study hopes to enact the introduction of the interactive whiteboard as a tool to enhance interactive teaching and learning particularly in higher learning institution in Malaysian classroom.

Based on the findings, it is hoped that this study will help the private higher learning institutions to encourage transformational teaching and learning approaches in order to develop more teaching and learning materials using the Interactive Whiteboard. Furthermore, they can have another option so that the teachers do not solely depend on printed materials, which are inflexible and pricey.

It is also hoped to be a guide for the educators in particular from higher learning institutions to design and develop good instructional materials using the interactive whiteboard and expose students in particular the students from a foundation programme in the School of Architecture in private higher learning institutions to be receptive towards the current presentation tools in particular on the usage of Interactive Whiteboard as a presentation tool. Instructional designers can benefit from the findings of this study as design features and instructional activities for interactive presentation using the Interactive White Board are provided.

The findings from this study will enable teaching materials to be designed to support interactive verbal presentation which can be applied to various modules and levels of education. Apart from that, this study can offer helpful tips to determine which facets and traits that is important in developing and designing teaching and learning materials. Students will benefit in knowing that the Interactive Whiteboard used as a presentation tool, allows for students presentations to be done digitally and the editing process can be done during real-time and saved in a digital format.

Furthermore, immediate feedback can be recorded as this eases the editing process. This study proposes to focus on the development and evaluation of integrating Interactive White Board as a visual presentation tool in a foundation classroom can be the basis for a set of guidelines for teachers, instructional designers and policymakers.

Scope of the Study

This study concentrates on the module development that integrates the Interactive White Board as a presentation tool and it documents the processes in three different phases. The first phase emphasizes the analysis on the needs and problems among teachers on the development of integration of Interactive White Board as a presentation tool in a foundation classroom. The second phase focuses on the design of the module concentrating on opinions by subject matter experts and technology's expert to contribute to the module development process.

In the last phase, this involves the implementation and evaluation of the module and also the students' perceptions on the usage of the Interactive White Board as a presentation tool will be made known.

Delimitations of the study

This is one of the few interventional studies to be conducted in Malaysia with high participation rates of interventions and controls identifying the effect of usage of technology (IWB) in the classroom. The study approach had encouraged active participation; requirement for social interaction, individual's capability to acquire and to adjust to innovative skills or knowledge and support thinking creatively. Of note, this is the first study that has identified five important domains relating the usage of technology in the classroom in particular, the usage of the Interactive White Board.. These domains further can be used as important factors to test the effectiveness of this instructional tool in a private higher learning classroom. The module developed can be incorporated into the planning and curriculum development process that can be used as a guide by the educators in especially in a flipped classroom setting.

Limitations of the Study

This research is a development and an evaluation of a module using the Interactive Whiteboard designed by the researcher. Since the study is confined to a certain group of experts and students only, their views may not be generalized to other experts' and students' views. The module designed and developed by the researcher may be suitable for use in classrooms with computer infrastructure and the interactive whiteboard. Hence, it may not be relevant for institutions without the interactive whiteboard. Processes involved in designing and evaluation of the module using the interactive whiteboard was based on ADDIE Model. The formative and summative evaluation was done on the instructional material and on the students' perspective of the students' learning on the suitability of integration of this technology in the flipped classroom. Therefore, findings of the study may not be suitable to ascertain the effectiveness of the module in increasing the student's performance.

Operational Definitions

Constructs were given the following operational definitions:

1. Interactive White Board: An Interactive White Board is an instructional tool that allows computer images to be displayed on a board using a digital projector. The instructor can then manipulate the elements on the board by using his finger as a mouse, directly on the screen. Items can be dragged, clicked and copied and the lecturer can handwrite notes, which can be transformed into text and saved. (BBC Active,2010).

2. In interactive learning situations, the learner is a participant in the process rather than a spectator (Bell, 2002).

3. Oral communication skills: The term skills of oral communication refers to capability to do something well and includes the following skills such as listening skills, conversational skills, giving feedback, meeting skills, presentation skills, workplace communication, problem solving skills, negotiation skills, training skills, interviewing skills and persuading skills as highlighted by Gray (2010).

4. At-task behaviors were recognized as focusing on given instruction, able to comprehend and express the subject matter verbally, active participation in class, able to take instruction, complete given task and work as a group, cooperating with classroom procedures, having eye contact with the task or teacher, and looking for the teacher for further assistance in the appropriate manner, as defined in the Florida Performance Measurement System Manual for Coding (FPMS, 1996).

5. Off-task behaviors, according to FPMS, were defined as displaying disruptive behavior, being turned around in the seat, doing schoolwork other than that assigned or other non-subject-related activity, being out of the seat, head down on desk, making noises or faces, stalling, and talking out.

6. Module Development:Curriculum is often used to refer to a focus of study, consisting of various courses all designed to reach a particular proficiency or qualification; syllabus refers to the content or subject matter, instructional strategies and evaluation means of an individual course. The collective syllabus of a program of study represents a map of the curriculum for that program. A curriculum is developed through planning for a larger program of study and then building syllabi for courses to manifest the curriculum design and plan. However, even developing a syllabus for a specific course can be thought of as a form of curriculum development (Malik, 1996).

CHAPTER 2 LITERATURE REVIEW

Introduction

Technology can be integrated into the various teaching styles. Unfortunately, many teachers have been timid to test the waters using technology for instruction but with appropriate support and guidance given to teachers, the usage and confidence of technology in the classroom increases as cited by Kopcha (2012). The interactive whiteboard is an effective appliance to assist presentations in the classrooms and encourages student participation as suggested by Turel (2011). In addition to that, an Interactive Whiteboard can be used in a learning environment for the following activities (Smart Technologies Inc., 2006, pg.5):

a. manipulating texts and images

b. taking notes in digital ink

c. saving notes for review via email, the web or print

d. viewing websites as a group

e. demonstrating or using the software at the front of a room without being locked behind a computer

f. creating digital lesson activities with templates and images

g. showing and writing notes over educational video clips

h. using presentation tools built into the interactive whiteboard software to enhance learning materials

i. Showcasing student presentations.

Design and Developmental Research

Design and Development research is a category of analysis that is widely used in the field of instructional design and technology devoted to the formation of knowledge and the justification of existing practice (Richey & Klein, 2008, 2014; Richey, Klein and Nelson, 2003; Richey and Nelson, 1996). According to Richey and Klein (2007), design and development research refer to "the systematic study of design, development and evaluation processes with the aim of establishing an empirical basis for the creation of instructional and non-instructional products and tools and new or enhanced models that govern their development" p. 1. As mentioned above, both researchers have highlighted that design and development research focuses on the analyses of the process and influence of precise design and development outcomes regardless of being part or the entire analysis of the design and development procedure.

As cited from Richey and Klein (2005), design and development research type one focuses on model research. They further explain that this type of design and development research relates to studies of the development, validation or use of design and development models. Model research addresses the validity or effectiveness of an existing or newly constructed development model, process or technique. Furthermore, these studies often seek to identify and describe the conditions that facilitate successful design and development models.

In addition to that, this kind of research can be adopted by other design and development type of research to measure the effectiveness of introducing a particular model into a technology integrated module. Wilson and Klein (2012) highlighted an example of a design and development research. The aim of this study was to analyse the process of the Jeffries/National League for Nursing Framework for Designing,

23

Implementing and Evaluating Simulations (Adamson, 2015). He further elaborates on the study by stating that the medium scale research was conducted in a hospital in the United States.

This study had an instructional designer (who was the main investigator), two graduate nursing education specialists, one unit based educator, and 27 registered nurses who had been in practice for less than six months as participants for this study. Furthermore, this design and development research was administered to examine the processes used to design the simulation, later focusing on the implementation by faculty members, and its influence on inter-professional communication in a critical care setting.

The data collected from the designer, faculty and student participants were analyzed for evidence to study on relevance and to authenticate the design and development process by analyzing the conditions which facilitate their use of the new design and development procedures or models, student achievement as well as student and faculty evaluation of the newly developed module. These data were used to identify the strengths and weaknesses of the framework in this context as well as suggestions for improving it. Furthermore, The Design-Based Research Collective (2003) indicated that this type of inquiry can be used to study learning in a specific context through the design and testing of instructional strategies and tools.

Development and designing a module using the Interactive Whiteboard

According to Beeland, (2002), the Interactive Whiteboard can be developed to administer instruction in a variety of ways that can be categorized based on three modalities of learning. The first method is visual learning. Visual learning through the use of a whiteboard can range from the use of text and pictures, to the use of animation

and video. Auditory learning is the second technique. Activities that involve auditory learning include the use of words orally for pronunciation, speeches and poems. The use of auditory learning might also include listening to sound and music. The third modality of learning is tactile due to the touch screen feature of the Interactive White Board. He further points out, that by allowing students to physically interact with the board can assist with meeting the needs of tactile learners.

Therefore, incorporating these three modalities in designing a module or for a lesson in a classroom will enable students to engage in the learning process as well as increase their motivation level. Furthermore, he also reveals that visual learning can be utilized to provoke the students to think on levels that require higher order thinking skills. Apart from that, Chandler, (2005) clarifies that this technology provides opportunities for teachers to meet the needs of students with various learning styles through the use of multiple media.

Kristof and Satron , (1995) mentioned that in order to create an interactive learning system, one can separate the design process into three elements or parts, which are information design, interaction design and presentation design. Information design can be defined as the process of clarifying the communications goals and arranging the content into a design that serves those goals. According to Rip and Kemp, (1998) adding a current reference sequencing of instructional materials is also beneficial because it involves "the selection and organization of the knowledge, skills and attitudinal factors for any topic".

Furthermore, Van den Akker, Gravemeijer, McKenney, & Nieveen, (2006); Shambaugh & Magliaro (1997) mentioned that cognitive researchers summarized that short-term memory of humans can effortlessly overload with new material and that

careful step, structuring and sequencing assists the learner with processing new information. Dfes Publication, (2004) mentioned that the important features of an Interactive Whiteboard which can contribute to teaching and learning include the following which are colour, annotation on the screen, inclusion of sound and video clips, drag and drop, cut and paste, flip chart pages, split screen, rotating objects and linking digital objects to the screen.

On the whole the process involves lesser time, easier to manage as well as reduces the need to store paper-based resources. According to Richney & Klein (2007); Plomp, & Nieveen, (2007) developing instruction for computer and other media involves prior analysis, the design, delivery consideration and later evaluation. Its purpose is to create an activity and to promote learning among students. Furthermore instructional material is autonomous of the use of computers to deliver an instruction as opposed to "sitting with Nellie".

Evaluation of a module using an Interactive White Board

Assessment possibly will respond to two corresponding functions; formative and summative evaluations to foresee learners' improvements. A formative evaluation is done mainly for enhancement of a program in a learning environment. It provides feedback to teachers on their students' ability to master a particular knowledge. This in return will assist teachers in making apt instructional decisions to enhance pedagogical instructions (Perinpasingam, T, Ng F.P., Hassan, N., 2016) & Richey& Klein, (2007).

Summative evaluation on the other hand, involves gathering of data after implementing a particular instruction. It is done to appraise actual achievement (Bhola, 1990). These evaluations analyse a wider perspective of students' achievements as well

as gauge the effectiveness of learning materials. This also will facilitate educators in making decisions of any new intervention necessary. Technology is transforming classroom practice.

The change it brings enables students to improve their understanding as integrating Interactive Whiteboard into a learning environment promotes collaborative, learner-controlled, and inquiry-based learning. (Prensky, 2007;Fawcett, 2000). Even though various studies have been done in the area of technology integration in the classroom, however there is inadequate research done on module development in integrating the Interactive White Board as a presentation tool in a foundation classroom. The usage of the Interactive White Board started to gain popularity in the 1990's and it was developed by SMART Board for use in the corporate sector.

 Interactive Whiteboards are gaining popularity within the last several years as educational instructional tools in classrooms especially in the Malaysian classrooms (Perinpasingam , Lee, Cheah, Lee & Arumugam, 2014).

A wide base of literature related to technology and pedagogy exists, but for the purposes of this study, the search was limited to research on module development integrating the Interactive White Board to promote interactive presentation. A number of studies were located exploring Interactive White Board functions, usages, teaching methods, teacher attitudes, and subject-specific classroom applications. Of those studies located, the issues of student engagement and motivation were included in general terms as by-products of the research investigations, rather than as the primary focus. There has been considerable research conducted in the United Kingdom, much of it by the British Educational Communications & Technology Agency (BECTA, 2003), monitoring the

integration and effectiveness of interactive whiteboard use in British schools since their widespread adoption across that country.

Pedagogy and Technology

Academics who advocate the rise in usage of technology constantly argue that technology integration possibly will allow for an encouraging alternative approach to increase student's achievement (Mann, Shakeshaft, Becker, & Kottkamp, 1999). On the contrary, there is another group of researchers who disagree that by introducing a new technological tool into a learning environment will not contribute to improvement in student's performance. Cuban, 2001;Zhao, Pugh, Sheldon, & Byers, 2002; Georgina & Hosford, 2009).

On the whole, several academics have highlighted that research on technology integration in classrooms ought to pay higher emphasis towards the connection between technology, pedagogy and content knowledge, in addition to teachers' perspective of technology use (Koehler, Shin & Misra,2012).

Vannatta and Beyerbach (2000) had conducted a study on the usage of technology among preservice teachers and university faculty members. The study was done to motivate academicians in the faculty to increase technology integration in their respective classrooms in particular focusing on developing a constructivist method of creating lessons that in co-operate technology in classrooms .This research concentrates on the year of a grant project titled, "Goals 2000: Preservice Technology Infusion Project.". A mixed method was taken and the study paid attention on enhancing basic computer knowledge for both the existing faculty members as well as preservice teachers through workshop style training. The findings from the study revealed that both

the faculty members and the preservice teachers required a comparable amount of training and guide to incorporate technology in their classrooms.

Another research that was carried out by Wozney, Venkatesh, and Abrami (2006), to highlight a group of educator's point of view on technology integration in classrooms. They have conducted a survey among 764 elementary and secondary teachers in both private and public schools. This study was based on a questionnaire that was developed the researchers which is known as the Technology Implementation Questionnaire (TIQ).

The questionnaire contained 33 belief items that focus on the significance of technology, the expectation of technology use, and budget of technology use. Additionally, the study focused on several other areas namely demography of the educators, matters concerning use of technology in classroom and availability of materials for teachers to support the learning environment.

Based on the findings of the study done by Wozney, Venkatesh, and Abrami (2006), it is revealed that educators that are more inclined to use technology for teaching have positively adopted the usage of technology in their classrooms. This is due to the proper guide and support received on usage of technology in classroom which have enable the teachers to integrate technology into their respective modules as part of their module development process. Furthermore, this study has highlighted that many highly motivated teachers have relied on the usage of Internet for self-improvement of their teaching approaches using technology in classrooms. Additionally, as cited by Garthwait and Weller (2005) a similar finding was also obtained from the study about teachers using the internet to improvise the content of their module in a well-supported learning environment that is equipped with the necessary technology and resources.

Another pertinent finding suggested by Garthwait and Weller (2005) that a major involvement of teachers in developing modules leads to a positive outcome in integrating technology in classrooms. This also contributes to the accomplishments and attainment of the learning process as the study had revealed that four out of five teachers have mentioned that their students who were given direct usage of laptops were inspired and driven to finish the given task despite the fact that there was no major increase in student achievements.

In another study conducted by Krentler and Willis-Flurry (2005), it is revealed that by including technology into the program of study, there has been a rise in students' achievements and motivation as well as participation with the teaching materials that were prepared by the teacher. The academics measured student execution in a marketing module with the use of discussion boards. Then, the analysis was done to compare student involvement of on the discussion board with their accomplishments on an evaluation instrument. In conclusion, the researchers make known that there was a progressive interrelation between students' engagement with discussion board and the increase in the accomplishment of grades on the evaluation tool.

Weglinsky (2005) also highlighted that teacher plays a vital role in selecting appropriate technology and teaching materials in order to achieve intended learning outcomes effectively. This researcher had conducted a survey among 12th grade U.S. History students for an evaluation led by the National Assessment of Educational Progress (NAEP). The research came out with findings that state students who use technology constantly to accomplish assignments that require higher order thinking skills, do well in the examination. Hence, the outcome of this study encourages

teachers to prepare teaching materials that reinforces higher order thinking skills with the aid of technology that will students learning more engaging.

Technology is evolving every year and many are being put forward to be used as an instructional tool in the learning environment. Technological tools ranging from laptops to smart phones, clickers and the Interactive White Board are paving its way into many classrooms with the intention to promote interactive teaching approaches and improvement in student assessments.

A study done by Silvernail and Gritter (2007) suggest that technology integration in classroom can assist in increasing student performance if the educators select appropriate technological tools that map with learning outcomes of their respective modules. The teacher's role in a classroom is pertinent when incorporating technology in a classroom. Technology can bring about transformational teaching and learning process but it should not be disregarded as a tool to make teaching easier.

A technology used in a classroom should bring into play as a content-creator with the main intention to focus on learners to use a tool to showcase students ability to be skillful with the content of the module and needs of a programme (Weglinsky, 2005).A research led by Schmid (2006) delves into the usage of the Interactive White Boards from the perspective of the critical theory of technology whereby emphasis of a technology needs to be focused on the design of the and way it can be executed. He further concludes that the influence of a technology can be comprehended after contemplating various factors such as the function of the tool, teacher's consideration and opinions on the usage of the technological tool, students' perception and outlook and the learning environment with that had incorporated the technology.

In a nutshell, the effectiveness of technology integration is solely not dependent on the type of technology used but also on the classroom instruction and content too. Moreover, Lengel (2013) had suggested that teachers are required to be given opportunities to attend necessary training in order to make them more skilled and knowledgeable users of technology in the learning environment so that they are able to carry out the lesson in a competent manner. Wright and Wilson (2011) studied ten instructors 5 years after graduating from a teacher training program that have in cooperated technology in their classrooms to get to know more on their classroom practices. They interviewed and the findings revealed that these teachers have been using very basic technology integration approach in the classroom.

A few teachers have mentioned about using more forward and innovative instructional technological approaches. This was due to various crucial factors namely attending professional development courses, obtained support from the learning institution and public as well as a requirement for educators to interact with students using technology. These researchers have further recommended that it is crucial for educators who intend to integrate technology in classrooms to move forward by attending professional development programme and classes to adapt best practices into their respective classes.

In addition to that, Moore-Hayes (2011) conducted a research on technology integration readiness and its impact on individual capabilities of two groups which are pre-service and in-service teachers. Her findings indicated that training is the main factor in determining the usage of technology integration in the classroom and in service teachers are more stressed in presenting their ability to integrate technology in the classroom compared to pre-service teachers.

Interactive Whiteboard as a Teaching and Learning Instrument

Contemporary learning theories focus on student encouragement and knowledge construction. Beeland (2002) highlighted that the Interactive Whiteboard is a powerful tool for communication among students regardless of accessibility of computers. The Interactive Whiteboard supports communication and exchange of ideas as a new roadway for class presentation (Becta Publication, 2003). Additionally, Marzano (2009) found an increase in student achievement especially in learner response device, use of graphics to represent information and reinforce correct responses.

Interactive White Board as a teaching tool: Subsequently, it is also believed that planning lessons using the Interactive Whiteboard can facilitate instructors to trim their time spent organizing their teaching materials and be extra resourceful in their ICT integration (Mercer, Warwick, Kershner & Staarman, 2010). Meanwhile, Gerard,Greene, & Widener (1999) claim this medium of instruction as a valuable learning tool because it enables the teacher to utilise available tools such as highlighting, circling or using different colours.

This presentation approach facilitates the students to systematize new concepts through visual learning. Bidaki and Mobasheri (2013) further mentioned that using the Interactive Whiteboard encourages teachers to develop interactive materials with content and context because this digital lesson supports handling of information from various expediencies. Hence it helps the teacher to control and manage the lesson better. According to Smart Technologies Inc. (2004) the Interactive Whiteboard allows for flexibility because it caters for individuals and whole class assessment, hence the teacher works with the whole class.

Chandler (2005) clarifies that the Interactive Whiteboard offers the teachers strategies to develop interactive teaching. This is because teachers are able to gather feedback from students by listening to their explanations. Smith (2001) mentioned that using the Interactive Whiteboard helps the teachers to teach activities using ICT resources. He further adds that it encourages interactivity with content and context because this digital lesson supports the handling of information from various expediencies.

Interactive Whiteboard allows for a greater classroom appreciation and inspiration. This learning approach brings about 'interactive teaching' pedagogy, where higher order thinking skills are used in the teachers' methods of questioning. Pupils' active participation is appreciated when teachers evaluate their pupils' progressive understanding of holistic meaning (Jones & Tanner, 2002).

Beeland (2002) conducted a study on the engagement level of middle school students using three modalities of teaching namely: visual, auditory, and tactile. He put forward that instruction integrating these modalities with IWB would increase student commitment in the lessons. He then conducted a study with 197 students in ten classes by administering an adapted survey based on the Computer Attitude Questionnaire. The survey was conducted after the integration of the Interactive White Board in their classrooms. The survey consists of the Likert Scale questions that were used to analyze the levels of student enjoyment and engagement.

His findings have suggested that integrating Interactive Whiteboards had intensified student involvement and motivation owing to its presence of the learning approaches such as the modality and visual approaches. Hockly (2013) echoes the same teaching approach in using the Interactive White Board to enhance the motivation and

engagement level among the students. Smart Technologies Inc. (2004) conducted a study and the findings indicated that 66% of teachers noted a significant improvement in pupil's attitude and response to Mathematics lessons.

The Interactive Whiteboard also caters for special needs classrooms. According to Goodison, (2002), the Interactive Whiteboard supports various learning styles such as for the visually impaired students who can manipulate objects and text on a large surface. On the other hand, it also supports hearing-impaired learners because this board facilitates the presentation and use of sign language simultaneously.

According to Bivora and Vasbieva (2016) who have carried out a study on usage of the Interactive White Board to measure progress on learner achievement on grammatical proficiency among learners from French as a foreign language module. It was suggested that it has increased students enthusiasm towards learning grammar and encourages collaborative teaching and learning approaches as it supports greater discussion among teacher with learners and learners and other learners due to user friendly features that are available on the board. Moreover it is also suggested that promotes a variety of students learning style such as games and other interactive exercises. Another pertinent observation made was teaching with the Interactive White Board have made learning more engaging and students feeling more optimistic because it supports a conducive, affirmative and a futuristic classroom experience that makes overall learning method more beneficial to the learners.

Another study done by Vasbieva (2014) in a French classroom using the Interactive White Board encourages students to be more confident learners as it allows them to come forward and present their work at the same time display their capabilities of comprehending the knowledge gained and show case their hands on ability in front of

the class. Hockly, 2012 had echoed a similar finding that the Interactive White Board is mainly used for presentation and in order to make the Interactive White Board more compelling and dynamic, the students should be given opportunity exposure to use the board to express them and teachers should encourage this interactive and student-centered learning approach.

Campregher (2010) highlighted there have been a major transformation in the field of instructional technology. A significant difference can be seen in the learners perspective after a conducting an experimental research between two groups using co-operative learning approaches with the experimental group using the Interactive White Board and the control group without the Interactive White Board. The findings from this study have revealed that IWB enhanced students with interest in seeking of knowledge due to the interactive learning environment that supports different cognitive approaches as well as multiple intelligence learning style as students are exposed to learning through visual and kinetics approaches.

Dudeney, Hockly and Pegrum, (2013) have suggested that the Interactive White Board allows for learners to acquire a pertinent skill which is to receive feedback and give constructive opinions which is an essential skill they may not acquire even though they use other types of technology on a daily basis outside the classroom. Hence, this teaching approach prepares future ready students as they are exposed to an important skill which to evaluate and justify a given knowledge.

A study has been conducted and highlighted that a large group of educators does not have a very positive outlook towards using the Interactive White Board. This due to the lack of knowledge and exposure towards the usage of the Interactive White Board, many educators have developed a negative perception towards integrating this tool in

their classrooms. This is caused by limited training and information available to assist teachers to create interesting interactive lessons using the Interactive white Board.

Hence, as mentioned by Schmid and Whyte (2014) who have published a book with numerous case studies about the Interactive White Board being used in an engaging manner with very encouraging outcomes by educators with the intention to share and motivate other teachers to use the Interactive White Board with confident and without fear.

They have also suggested to visit the following website *iTILT* website (iTILT [www]) that contains sample lessons prepared by language teachers on the usage of the Interactive White Board to encourage and guide more teachers to explore the potentials that the Interactive white Board can bring about into their respective classrooms if the Interactive White Board is being implemented in their classrooms.

Interactive Whiteboard as a learning tool: According to Campregher (2010), with the invention of a new technology like the Interactive White Board, many teachers are positively integrating this tool as an instructional tool in their classrooms. He further adds, the Interactive White Board supports various learning and thinking approaches and also caters for students with a various levels of intelligence in a group based learning environment. An assessment based research conducted by Learning, P. I., & Initiative, T. (2009) indicated that 471 teachers have in cooperated various type of technology in their classrooms. It is found that many educators felt very optimistic about integrating the use of Interactive White Board in their classroom in Kazakhistan due to its user – friendly approach and numerous benefits gained by the students from their daily modules.

Smith, Hardman and Higgins (2006) conducted a study on the level of interaction that had taken place in a learning environment that uses Interactive White Board as teaching tool. They found that lessons using the whiteboards had encouraged two way communication like the use of convesation, quicker responses and increase in the number of responses received. The study also highlighted that the Interactive White Board modules supported greater level of interactivity in the classrom as it encourages involvement of the entire classroom that had have led to rise in student engagement when the Interactive white Board is used as an instructional tool in the classrooms.

A similiar findings was also reveaed by Morgan (2008) whom had suggested that the Interactive White Board play a pertinent function in encouraging student interactivity in the classroom. A case study that is led by the Jordan Education Initiative to reveal that that in order to comprehend the usage of Interactive White Board an analysis have been done for almost two years in several classrooms from various modules that uses Interactive White Board for two years. The findings from this study have revealed that there is an increase in interactive teachning and learning approaches. There was another pertinent finding which is revealed an increase in student performance across both genders when compared before the use of the Interactive White Board after nearly two years of using the board.

The given list below is inferences data gathered from the finding of the study on "Evaluation of the Primary Schools Whiteboard Expansion Project" (Becta, 2007, 2010). The list is as follow:

a. The IWB has been welcomed enthusiastically by a large number of primary teachers and its take-up in schools has proceeded with unprecedented rapidity.

b. The Primary Schools Whiteboard Project provides considerable evidence of the value of interactive whiteboards in terms of increased pupil motivation and teachers' job satisfaction.

c. Pupils are universally enthusiastic about the interactive whiteboards, because of their clear visibility ("We can see!"), the easy access they give to ICT through touch, and the added variety they bring to lessons.

Moss, Jewitt, Levaãiç, Armstrong, Vicky, Cardini, Castle, (2007) have carried out a study entilted *"The Interactive Whiteboards, Pedagogy and Pupil Performance Evaluation: An Evaluation of the Schools Whiteboard Expansion (SWE) Project: London Challenge"* and highlighted that the outcome of the study has no influence in the students achievements in the first year of introduction of Interactive White Board, students were conscious of their about outlook and their expression using theInteractive White Board and some of the students were not wanting to go forward to utilize the Interactive White Board. On the whole, these students were very optismistic of the influence of the usage of the Interactive White Board towards their learning process.

In addition, European Schoolnet (2006) had mentioned that in The ICT Impact Report which is an analysis of 17 research work on influence of use of technology on student performance in European schools from the year 2002 to 2006. The findings from the study conveyed the usage of the Interactive White Board have indicated an increase in students test scores in nationwide exams for subjects like English , Mathematics and Science. In contrast, the results of students who have not used the Interactive white Board on their classrooms indicated otherwise. Moreover, other added benefits gained from this innovative teaching approach were student felt more inspired

and involved which had created better student contribution and sharing towards the learning experience.

Another noteworthy impact of using the Interactive White Board from this study is that students are able to comprehend the lessons in a shorter time frame. A similar finding were also revealed by Higgins (2005) whom had mentioned that the Interactive White Board supports a rapid progress in the interaction between teachers and students, unlike in a traditional chalk and talk classroom setting.

Smart Technologies (2010) have highlighted a study done by Lancaster University's Department of Educational Research. The study centers on influence of technology to increase student enthusiasm in learning. The study focus on teachers who played as the agent of change have inspired the student as it was reported that the usage of Interactive White Board together with Internet materials together with visual delivery software, eased the enhancement of the students progress in the learning process. Furthermore, it was made known from this study that both the teachers and students felt optimistic about using the the Interactive White Board when used effectually.

Another study from the University of Virginia as mentioned by Smart Technologies (2010) indicated that there is an advancement in the teachers attribute towards lesson and time management if relevant teaching instructions were adopted with the support of appropriate technological tools and resources. Chuang, Shen and Wang (2008) have highlighted that in order to encourage higher level of interaction during a lesson using the Interactive White Board, the students need to be exposed and encourage to use the appropriate Interactive White Board tools by getting these learners to interact with the Board on their own using available presentation tools especially during in class discussion and presentation in order to garner better learning impact in the classroom.

Additionally, several other academicians have recommended that in order to gain the utmost benefit from integrating Interactive White Board in classrooms and to increase interactive learning experience, it is best to get each student come forward and utilize the board (Marzano and Haystead, 2009; Miller & Glover, 2010). Another study conducted by Marzano & Haystead (2009) highlighted that considerably better alignment of a various direct approach of usage of the Interactive White Board among learners . As cited by Zevenbergen and Lerman, (2008) many students have the tendency to use basic tools that may not contribute in enhancement of higher order thinking skills.

According to Champergher (2007), whom have conducted a study on integrating the Interactive White Board in language classroom by conducting a quasi-experiment study with primary school students. The researcher have identified that the Interactive White Board is a suitable technological tool because of its unique feature which is interactivity. The central tools of the Interactive White Board namely are like dragging, clicking, editing and managed using these information on the spot using available software on the board that can that can be saved or recorded in various files and format. As cited by Beeland (2002) the interactive teaching feature Interactive White Board is that it supports display of knowledge using audio, visual and auditory methods. A major advantage of using the Interactive White Board to it promotes visual learning through the projection of images like pictures, photos, maps, diagrams and videos. Therefore, as highlighted by Champergher (2007), this innovative tool that supports interactive teaching and learning approach that enables storage of lessons enables self-reflection that supports higher order thinking skills.

On the whole, a major finding in terms of teaching with the Interactive White Board is that it allows teachers to design their own respective interactive modules and

prepare their activities in advanced. Furthermore, the study concludes that students were more eager to learn, pay extra better attention in classrooms as well as have better learning autonomy.

Another study by Zittle (2004) cited that teachers from Navajo elementary schools have conducted an experiment with their elementary students on the usage of Interactive White Board. The findings have revealed that teachers who have used Interactive White Board in their respective classrooms have a higher post–test score compared to the pre-test score after the intervention using the Interactive White Board to teach mathematics as compared to the scores of students whose teachers taught using the conventional manner which is without using the Interactive White Board.

The Interactive White Board encourages a greater classroom appreciation and inspiration. It enables the students to concentrate on the given task, increasing their enthusiasm to attend and focus in the classroom. Current learning theories promote student encouragement and view it as the component to knowledge construction. The Interactive Whiteboard enables a powerful interaction with students while they sit in with or without a computer in front of them. It also provides a large workspace for hands-on work with multimedia resources.

Apart from increasing student's engagement, the Interactive Whiteboard encourages focus on student's responses. It enables the students to concentrate on the given task, increasing enthusiasm hence providing extra motivation to attend classes. According to Bell, (2002) students are more attentive and motivated when lessons were offered using the board rather than using other teaching methods.

Apart from that Smith H. (2001) mentioned that students have higher retention rate during the Interactive Whiteboard enhanced session. Furthermore, he adds that the

Interactive Whiteboard engages children and focuses their attention on a multi-sensory and diverse way because the learners are allowed to create, view and manipulate pictures, sounds and text using the board.

A teacher's guide to usage of the Interactive White Board in classrooms: Reedy (2008) also mentioned that IWB supports "presentational approach to learning". Hennessy (2011) highlighted that IWB can influence the audience and engages the whole classroom as IWB is used as the central focal point as a discussion tool during the delivery of a lesson or used for presentation. Furthermore, it allows for a good grasp of materials and supports good classroom control at the same time. Moreover, as claimed by Underwood & Dillon (2011), a module integrating the Interactive Whiteboard will be of a great use if it is adopted with appropriate pedagogical facet and apt instructional designs. According to Dudeney & Hockly (2012), British Council was one of the earliest organizations to incorporate the Interactive White Board in the language class which was first introduced in early 2000.

The introduction was more to cater to the current teaching trends in the language classroom without much attention given to teachers and students teaching and learning experience and exposure. Hockly (2013) had mentioned that European Union-funded project known as Interactive Technologies in Language teaching acknowledged that two areas that need to be focused on teacher training and having relevant Interactive White Board resources like teaching handbook for teachers and video of IWB classroom in usage can provide more meaningful teaching and learning experience to both teachers and students. He had also added that the training should emphasize student-centered approach for integration of Interactive White Board in a classroom as most lessons that

have been developed using the Interactive White Board are more teacher-centered approach.

According to European Commission (2013), almost 70% of Norwegian classrooms are equipped with the Interactive White Board, however only 10% of the teachers have explored the usage of the Interactive White Board in their classrooms due to lack of exposure of pedagogical integration with technology and resources.

Furthermore, as suggested by Miller & Glover (2010), teachers need to be knowledgeable in order to effectively implement the usage of IWB in classrooms. In addition to that, as mentioned by Avidov-Ungar & Eshet – Alkakay (2011) successful innovative instructional approaches using the Interactive White Board can be obtained through professional development and the willingness of the teacher that can bring about desired outcome for the intended purpose of the integration of the Interactive White Board in classrooms.

Becta Publication, (2003) refers this medium of instruction as a valuable learning tool because it enables the teacher to emphasize on a particular structure by highlighting, circling or using different colours enabling the students to be able to systematize new concepts. Therefore, the Interactive White Board supports a variety of learning styles which includes visual, auditory and kinesthetic (Passey, Rogers, Machell & McHugh, 2004 and Schut, 2007. Educators integrate various pedagogical approaches to integrate the usage of the Interactive White Board by focusing on the needs of the related module which include learning needs, interests, and technical support.

According to Tosuntaş, Karadağ & Orhan (2015), there are numerous positive outcomes on instructional methods using Interactive Whiteboard towards learning among students that were highlighted from various studies such as highlighting, coloring, or

annotating important contents. In addition to that, the Interactive White Board allows for flipping back and forth to review previous contents providing reviewing techniques for better understanding (Levy, 2002; Smith et al., 2005).

Furthermore, the Interactive White Board also allows the use of pictures for discussion and brainstorming, collaborative writing, shared reading, peer-teaching, and collaborative problem solving (BECTA, 2006), hide and reveal, drag and drop, and matching items activities (Türel, 2010), observing different media which is essential for visual learners (Bell, 2002), touching and feeling the material which is good for tactile learners (Bell, 2002), accommodating lower ability and special needs individuals for instance zoom features for visually impaired students as mentioned by Turel and Johnson (2012), presenting ideas and reflections about the course content and finding hidden parts of a picture with spotlight or screen-shade (Beauchamp & Parkinson, 2005), capturing screenshots from web pages synchronously and manipulating them, correcting mistakes in the materials (Beauchamp & Parkinson, 2005) and playing games (Smith, Higgins, Wall, Miller, (2005).

In addition to that, Türel and Johnson (2012) pg.314, have highlighted numerous benefits of IWB technology from a variety of studies which include enhanced social interaction (Türel & Demirli, 2010), reformed learning environments where teachers may facilitate student's involvement, interaction, and collaboration (Smith et al., 2005), able to draw the learners' attention also facilitated learning and remembering using visual media (Türel, 2010), allows IWB users to enlarge computer touch screen and Interactions can be record, saved using Acrobat (PDF) document, PowerPoint slides, or record the whole lecture as a movie file also using −voting systems, document cameras, and electronic microscopes (Bell, 2002).

Hence, by acquiring the IWB technical competencies and skills, teachers or instructors who have perceived that the Interactive White Board is user-friendly instructional tool has gained confidence and have developed a positive outlook towards using the Interactive White Board in their classrooms. (Tosuntaş,Karadağ,& Orhan ,2015). Although various studies suggest that an ideal use of Interactive White Board may have a positive impact on learning and instruction, it is important to investigate how teachers in classroom settings are using Interactive White Boards.

In order to better understand teachers' Interactive White Board use, the examination of different factors is needed such as time, instructional strategies, and techniques. Depending on the frequency and duration of Interactive White Board use, teachers gradually develop their skills and abilities (Hodge & Anderson, 2007).

To this end, various findings from different countries, educational level, and subjects have been highlighted as they highlight teacher's positive opinion about the Interactive White Board.

Improvement in students' performance with the integration of the Interactive White Board

According to Bivora and Vasbieva (2016) who have carried out a study on the usage of the Interactive White Board to measure progress on learner achievement on grammatical proficiency among learners from French as a foreign language module. It was suggested that it has increased students enthusiasm towards learning grammar and encourages collaborative teaching and learning approaches as it supports greater discussion among teacher with learners and learners and other learners due to

user-friendly features that are available on the board. Moreover, it is also suggested that promotes a variety of students learning styles such as games and other interactive exercises. Another pertinent observation made was teaching with the Interactive White Board have made learning more engaging and students feeling more optimistic because it supports a conducive, affirmative and a futuristic classroom experience that makes overall learning method more beneficial to the learners.

In addition, Haystead and Marzano (2009), have carried out a study from the year 2008 until 2010 to ascertain if Promethean ActivClassroom used as a tool can increase student performance. This large-scale study that was initiated in 2008 was conducted on a national level involved approximately 5,000 learners, 123 educators and 76 schools ranging from rural to urban areas. Based on the findings obtained from the research, it was found that there was a rise in student achievements approximately by 16 percentile points when teachers integrated their modules using the ActivClassroom.

According to Becta (2007,2010), the assessment obtained from a study on the development stage of the Primary Schools Whiteboard Project that received £10 million in the year 2003 to 2004 to encourage the attainment and the usage of the Interactive White Boards in primary schools in 21 home-grown establishments. The Primary Schools Whiteboard Project found that teachers have a better job satisfaction and students were more enthusiastic when learning using the Interactive White Board. Apart from that Jamerson (2002) points out that this board enables students with ADHD to be attentive, less hyperactive during this technology-integrated instruction.

Learning with the Interactive Whiteboards in the classroom allows for effective student retention and ultimately improves performances among learners. This idea was also echoed by Schut (2007) who conducted a survey on student perceptions of IWB use

in science classrooms. The outcome of the study indicated that the lesson was more engaging and had improved student performance due to visual elements and multimedia competencies like animations and colorful pictures and diagrams.

Development and Integration of the Interactive White Board in classrooms.

Table 2.2

Matrix on Past Studies on the integration of the Interactive Whiteboard in the classroom.

Study	Country	Research Objective	Research Method/ Design	Sample	Main Findings
Perinpasingam, Lee, Cheah, Lee & Arumugam (June, 2014).	Malaysia	This study aims to evaluate the effectiveness of integrating the Interactive Whiteboard in conducting visual presentations in an architecture classroom.	A qualitative study was used and data collected from focus group interview.	Two content experts and two educational technologists. The summative evaluation included a group of five students from a private higher learning institution.	The findings of this study indicate that IWB can enhance the learning process, increases motivation and be used as a suitable tool to promote interactive presentation.
Perinpasingam,T. Arumugam,N, Subramaniam,S., Mylvaganam,G (September,2014).	Malaysia	This study reveals the outcome of the design and evaluation module using Interactive Whiteboard in the teaching and learning of Science in a Year Three classroom	A qualitative study was used and data collected from focus group interview.	Two content experts and two educational technologists. The summative evaluation included a group of five primary school students	Teachers agreed that using an IWB is motivating, engaging, and enjoyable for both teachers and students when appropriate guidance given for module development with the integration of IWB.
Bidaki,M.Z. & Mobheri,N.(2013)	UK	To explore interest into the whiteboards, of both staff and pupils reporting	Mixed method with the use of interview and questionnaire.	198 students in a primary school.	IWB positively increases pedagogical skills. Therefore, the process of

48

Study	Country	Research Objective	Research Method/ Design	Sample	Main Findings
		improvements in enthusiasm and learning achievements.			changing skills and adaptation with new pedagogy methods for using IWB is easy.
Aytan,T (2013)	Turkey	To gain insight on student's point of view and challenges faced while using IWB in classroom.	A quantitative study was adopted and data was collected through a questionnaire.	202 students 98 primary students and 104 high school students.	The findings of this study indicate that IWB can enhance the learning process and increase motivation.
Türel, Y. K., & Johnson, T. E. (2012)	Turkey	To evaluate how teachers use IWB	Quantitative research method with the use of questionnaire.	174 Turkish teachers ranging from grade 6 till grade 12.	Most teachers agreed that using an IWB is motivating, engaging, and enjoyable for both teachers and students.
Maher, D. (2012).	Australia	To evaluate on usage of IWB in whole class teaching	Quantitative research to use Interactive White board	100 primary school children	Findings reveal that IWB was able to support dialogic interactions and the teacher played the role of the facilitator
Termit Kaur & Abdul Rashid, (2012)	Malaysia	This study explores on insights into students' perspectives in the teaching and learning of Science	A qualitative study was used and data collected from focus group interview.	The focus group interviews were conducted with twelve focus groups of 10 students in each class after the sequence of 40-minute or 80-minute lessons had	This study indicates that students interact more in classrooms where technology is used effectively.

49

Study	Country	Research Objective	Research Method/ Design	Sample	Main Findings
					been conducted by the teachers.
Türel, Y. K. (2011).	Turkey	The purpose of this study is to develop a valid and reliable interactive whiteboard student survey in order to evaluate the IWB use based on perceptions of students who have been taught with IWBs.	Quantitative research design. Data collected through a survey.	263 middle school students.	Findings from teacher's perspective reveal that IWB is suitable to be used as a presentation tool.
Mercer, N., Warwick, P., Kershner R. & Staarman, J. K. (2010)	UK	Active role of the IWB when small groups were able to use it as a resource for accessing information and thinking collectively during collaborative science activities.	A qualitative study was used and data collected from observation and focus group interview.	12 teachers	Interactive White Board is a suitable instructional tool as it supports active engagement with appropriate teacher's scaffolding strategies.

Empirical Research

Interactive Whiteboards are becoming increasingly popular in international educational environments. It was reported at the 2008 Australian Computers in Education Conference during a keynote address that interactive whiteboards are currently in over 99% of UK schools (Cox, 2008). This technology is now being introduced into Australian schools and educators are questioning how this technology can be used to support learning and teaching. Besides, researchers (Termit Kaur & Abdul Rashid, 2012; Dalbir Singh, Ridha Omar & Azfar Anuar, 2010) disclosed that Interactive Whiteboard

not only motivates students but also engage them with the teaching and learning process. They also highlighted that students interact more actively in classrooms where technology is used effectively.

Smith et al., (2005) established the idea of interactive pedagogy using the interactive whiteboard. This brings about 'interactive teaching' pedagogy, where higher order thinking is used in the teachers' questioning skills and pupils' active participation are appreciated when teachers evaluate their pupils' progressive understanding against holistic meaning (Jones & Tanner, 2002). In addition to that, researchers such as Harris, Mishra and Koehler (2009) revealed that a multifaceted interplay occurs between the combination of precise instructional technologies and their related applications in classrooms. Interactive whiteboard (IWB) can enhance interactive teaching and learning by opening an avenue for pupils to express their views openly with confidence. The IWB provides collaborative opportunities for reasoning, sharing of ideas, and to negotiate new meanings based on the viewpoints of others (Rogoff, 1995).

The integration of information and communication technology into the foundation classrooms is increasingly important for engaging and motivating today's students, especially for the verbal presentation related task. To inform learning and teaching, Hackling & Prain (2006) found that 'Information and Communication Technologies (ICT) are exploited to enhance learning" (p. 19). Educational research has suggested that it is possible to integrate ICT effectively into classrooms with the use of interactive whiteboard technology (Shenton & Pagett, 2007), Murcia & McKenzie, 2008). Schuck and Kearney (2007) investigated the use of Interactive Whiteboard in K-12 pedagogy in some primary and secondary schools.

The teachers, students and school executives participating in this research signified that the Interactive Whiteboard is user-friendly, facilitates reflective practice as well as assists to discover and learn new skills. An important point was also revealed that for teachers, it plays as a catalyst for teacher learning and as for students, it matches their digital culture. In Malaysia, the literature has not paid sufficient attention to designing interactive modules, especially teaching students at a private higher learning institution in Malaysia (Perinpasingam, Lee, Cheah, Lee & Arumugam (2014) and Perinpasingam, Ng, Hassan, 2016).

Technology has aggressively invaded the classrooms, competing against traditional pedagogical practices. Educators are faced with the perennial challenge of how to provide a depth and breadth of subject matter to students in order to create 'informed citizens' in a foundation classroom. Therefore, instead of being intimidated by technology, teachers have to be computer savvy, capable of using electronic mail and surfing the Internet to find sources for their lessons. For these reasons, the Interactive Whiteboard is a preferred multimedia instruction, due to its visual presentation and its interactive attributes.

An Interactive Whiteboard can be exploited in a learning setting to maneuver text and images. It also allows saving of notes for review using the Internet, printing of these notes and also sharing of these among group members using websites. The incorporation of digital lesson activities with templates and images as well as making use of presentation tools in this Interactive Whiteboard software enhances learning materials. (Smart Technologies Inc., 2004). Such experiential learning does not take place in the chalk and board method or even by using the overhead projector.

Though there are a limited number of research studies specific to interactive whiteboard use in classrooms in the United States, numerous studies and research articles on various aspects of IWB use in the United Kingdom have been published, most notably by Glover and Miller, who are associated with BECTA. Levy (2002, p. 1) who cited from BECTA mentioned that research reported that interactive whiteboards are tools which "enable access to and use of diverse resources for the benefit of the whole class while preserving the role of the teacher in guiding and monitoring learning".

Although there have been studies conducted in the United States recently involving whiteboard use in classrooms, much of that research has investigated on Interactive Whiteboard use from teacher perceptions: interactive pedagogical approaches, integration of Interactive White Board in classrooms for various subjects and professional development needs and practices.

Apart from that, other research areas involving use of the Interactive White Board include student perspectives on selected modules with the integration of the Interactive White Board, student accomplishment and attitudes which comprises of students from different grades and entry level. In addition to that, several studies have been done on the impact of the usage of Interactive White Board secondary schools students' motivation and engagement.

According to Beeland (2002), a study revealed that IWB use can increase student engagement due to visually oriented pedagogy. Moreover, The Weimer (2001) study investigated IWB use and student motivation of high school students after a project completion through student self-perception surveys. The inadequacy of research that was directly applicable to this investigation is indicative of a lack of research to date, regarding IWB use and its effects on students, in particular foundation students in an

Architecture classroom of a private higher learning environment in Malaysia and the need for further investigation of development and integration of the Interactive Whiteboard as visual presentation tool and learner-related aspects of interactive whiteboard use as an instructional tool in the classroom.

Interactive White Board use accommodates the overarching theories of social constructivism, and the several pedagogical considerations of concern to educators related to student needs: inclusion of interactive learning methodologies, consideration of student learning styles, the developmental needs of foundation students, and the effective influences of student motivation and engagement. The research regarding these considerations is explored next for relevance and applicability to the current research endeavor.

Interactive Learning

Current learning theories promote student encouragement and view it as the component of knowledge construction. Interactive whiteboard enables a powerful interaction with students while they sit in with or without a computer in front of them. It also provides a large workspace for hands-on work with multimedia resources. Beeland, (2002) carried out a study on the Interactive Whiteboard as an instructional tool, which affects student engagement. His findings indicated that the interactive whiteboard could be used in the classroom to increase student engagement during the learning process. Smith (2001) also agrees that the Interactive Whiteboard creates zeal for learning among students. Furthermore, Becta Publication (2003) mentions that the Interactive Whiteboard supports interaction and conversation due to its new roadway for presentation.

Interactive learning, espoused and advocated by constructivism, requires that students be dynamically engaged in lesson activities. It incorporates a variety of educational strategies, such as the use of visuals, reading and writing, discussing, and manipulating concepts. The constructivist perspectives exemplify the perception of individual student learning styles. Learning style preferences impact the way in which learning and understanding take place. Since every classroom has students with diverse leaning styles, educators attempt to integrate instructional strategies that will meet the requirements of each child. Furthermore, Interactive Whiteboards offer a distinct opportunity in those individual learning style differences. The range of learning styles with which educators are most familiar include the visual, auditory, and kinesthetic modalities. But the concept of learning styles and multiple intelligences has been expanded, most notably by the contributions of Gardner (1993) who identified eight core intelligences.

With careful planning, the use of interactive whiteboards in instruction can incorporate the various learning modalities in ways that make learning more appealing. Lessons using the IWB can be structured to allow hands-on participation while encouraging reflection through whole class discussion. Interactive whiteboards can display facts and data, sequence information, and include video clips, real-time sites, pictures, animations, diagrams, and be used to preview content, connect it to prior knowledge, and explore real-world applications. Visual learners benefit from seeing information displayed in colorful, large format. Kinesthetic learners have the opportunity to write on, highlight, and interact with the IWB. Auditory learners are accommodated through dialogue, sound effects, and oral stimulation.

Table 2.1

How this present study will bridge the gap?

Gaps	How this study will bridge the gap?
The inadequacy of research that was directly applicable to this investigation on lack of usage of the Interactive White Board as instructional tools is indicative of a lack of research to date, regarding IWB use and its effects on students, in particular foundation students in an Architecture classroom of a private higher learning environment in Malaysia and the need for further investigation of the development of a module with the integration of the Interactive Whiteboard as a visual presentation tool and learner-related aspects of Interactive White Board use as an instructional tool in the classroom.	This study will address the gap on lack of usage of Interactive Whiteboard as an instructional tool at a private higher learning institution. Therefore, the focus of this study is on the criteria and the processes involved in developing a module guideline integrating Interactive White Board as a presentation tool in a foundation classroom. Furthermore, the effectiveness of the module was also analysed.

Conceptual Framework

The conceptual framework of this study is developed on the variables of the study. The ADDIE model will be used to systematically structure the process of instructional design of the module with the integration of the Interactive White Board. The ADDIE model is a developmental framework that consists of five various steps namely analysis, design, development, implementation, and evaluation.

It is a strategic plan for course design and may serve as a proposal to design various other instructional activities. ADDIE model stands out among other instructional design models because each step has an outcome that feeds into the next step in the sequence in particular for individual lessons. In addition to that, ADDIE is like a cycle.

Due to its flexible phases which enable anyone, to revisit a step at any point of time, and enhance an instructional material as suggested by Richey, Klein and Tracey (2011).

Furthermore, ADDIE is one of the most recognized and widely used ISD models as suggested by Forest (2014), who also stated that it is also extensively used by the military forces. Moreover, as highlighted by Balturay (2008), the ADDIE model is the foundation for many instructional design models. It permits for the objectives or activities to be well-defined and neatly organized lessons. Apart from that, additional benefits of the ADDIE model are saving in cost and time for students and educators. The ADDIE model is so reliable that it creates competent teaching materials that lead to dynamic learning materials. Therefore, the ADDIE model was widely used since the industrial era, where the principles behind this model are still applicable and are used as a stepping stone towards other instructional models across multi-disciplines where a similar arrangement is maintained namely analysis, design, development, implementation, and evaluation.

Additionally, ADDIE supports various evaluation approaches which include testing of certain criteria such as evaluation of cost, time and measuring behavioral outcomes. According to Castagnolo (2011) on the whole, ADDIE model focuses on identifying and amending the drawbacks related to design imperfections that can be resolved upon gaining continuous responses from all five phases. The initial phase of this model which is the Needs Analysis phase revolves around audience's needs, restrains, current notion and the intended outcomes for particular content or required skills. The next phase involves the Design phase. At this level, learning outcomes, subject matter, delivery approaches, types of activities for students and selection of criteria for assessment.

This is followed by the Development phase that initiates preparation of the module or learning materials to be used in the classroom or for training purposes. Implementation phase involves carrying out or presenting the accomplished plan to target audience or leaners. Later, during the Evaluation phase which measures the competency of the content and developed materials to be used in the classroom or for a training session utilized in the training program and makes improvement changes for the next implementation or presentation.

The first step in the ADDIE model is *analysis*. In the analysis phase, the instructional problem is recognized along with the characteristics of learners. This step will be used as a plan for the whole ID process as well as a guide for the subsequent steps. In the analysis phase, a timeline may be established to complete the instructional module. This level discusses the needs and relevance of integrating Interactive White Board in a foundation classroom. Therefore, an interview with the Programme Director and a foundation architecture lecturer will be carried out.

Findings from the informal interview and is needed to integrate the usage of the Interactive White Board as a presentation tool in a foundation classroom together with a survey on the opinion of the use of PowerPoint slides and the Interactive White Board will be analysed. The second step is *design*, where a plan of instructional approaches will be generated and learning activities and assessments are selected. At this stage, the focus is on the learning objectives, contents, materials, selection of software for the tools to be integrated into the module using the Interactive Whiteboard.

The third phase is known as the *development phase*. This phase focuses on the content of the module, learning assignments, and assessment. The development phase also requires one to identify a relevant technology that can integrate into a selected

module to enhance the understanding of the learning process. This phase discusses a step by step process with a duration of five weeks of integrating the Interactive Whiteboard in the foundation classroom.

The fourth phase is known as the *implementation* phase which includes the testing of samples where training for the instructor occurs followed by learners partaking in the instruction. At this level, continuous modification of the programme to ensure efficiency and positive outcomes are achieved. The final phase is known as *Evaluation* which consists of two parts namely formative and summative evaluation. Formative evaluation involves measuring of the learning outcomes during the instruction process which involves experts. On the other hand, summative evaluation focuses on the learning outcomes after instructions in the final stage are completed and the evaluation will be executed to two groups of foundation students.

59
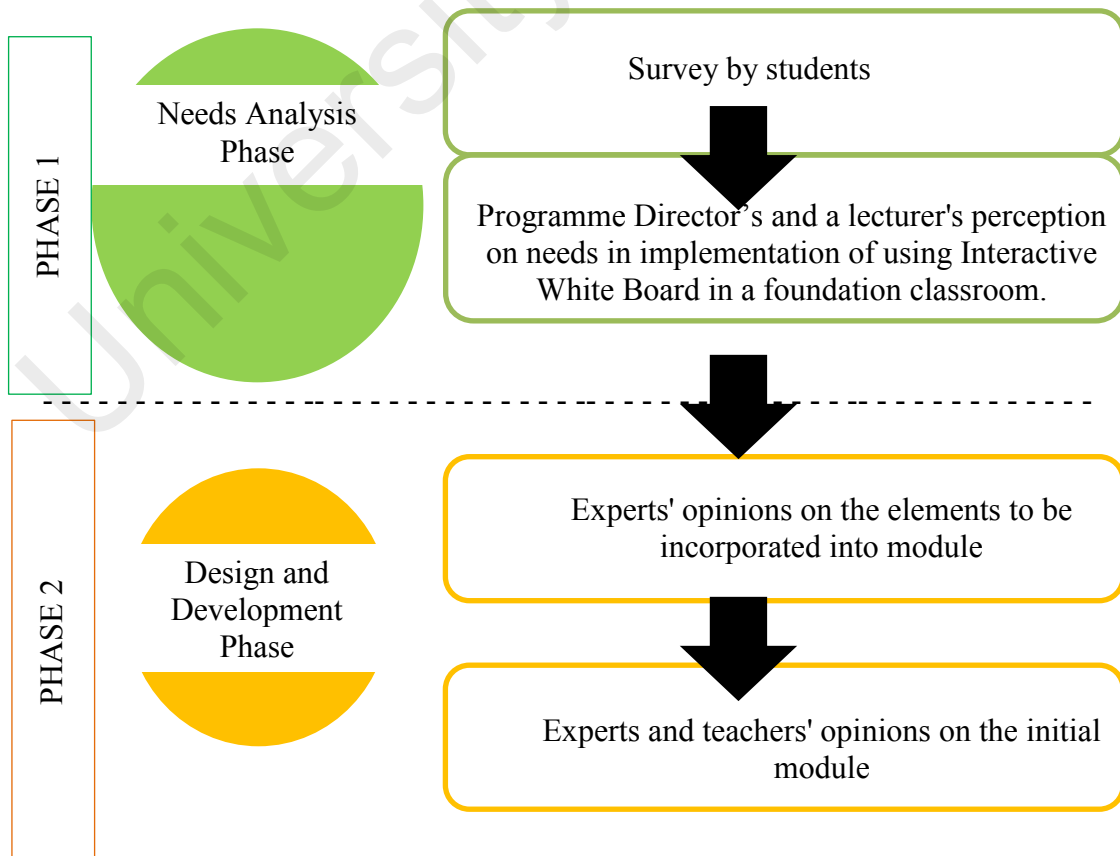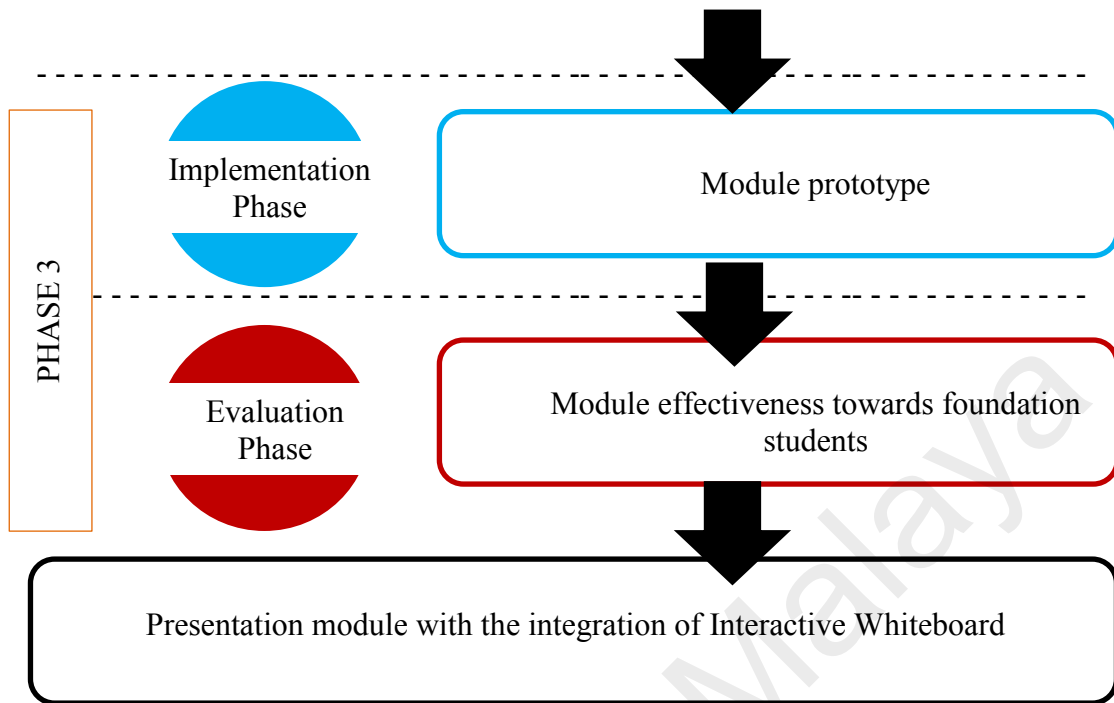
Figure 2.1.*Conceptual framework for the study based on ADDIE's model*

Theoretical framework

The inclusion of instructional technology is widely backed by several pertinent learning theories. One area of learning theory being focused for this research is constructivist paradigms of learning. The theoretical foundation for this study on module development with the integration of the Interactive White Board as a presentation tool is based on Vygotsky's philosophy that promotes the social cognitive theory which highlights that learning takes place and it is filtered through a child's culture in particular through the subject matter and thinking style. The social cognitive learning perspective advocates that students learn well in the company of others, where group learning play a vital role in comprehending the contents.

On the whole, learning is enabled through guided instruction, problem-solving, and peer interactions. Therefore, two constructivist learning theory were identified, which comprise of the Zone of Proximal Development (ZPD) acquainted with Vygotsky (1978) and Piaget's process of adaptation (1952). Furthermore, the theoretical foundation of this study consists of The Technological Pedagogical and Content Knowledge (TPACK) which was created on the foundation of pedagogical content knowledge and also focuses on the unique ways for educators to effectively integrate technology in the classroom (Mishra & Koehler, 2006). The researchers found that not only did teachers develop content-specific examples and translate the material for the audience, but they also had to understand and adapt their approaches with the relevant classroom technology. Additionally, technology adds more to the density of the instructional technology approaches.

This intricateness has also led to an increase in awareness among educators on the use of instructional technology, and connects with teacher's understanding of content and pedagogical methods. Figure 2.2 reveals the theories that underpin and support this study. Lastly, the theoretical framework for the study will be presented in Figure 2.6 and how they merge to form the theoretical framework is then discussed.
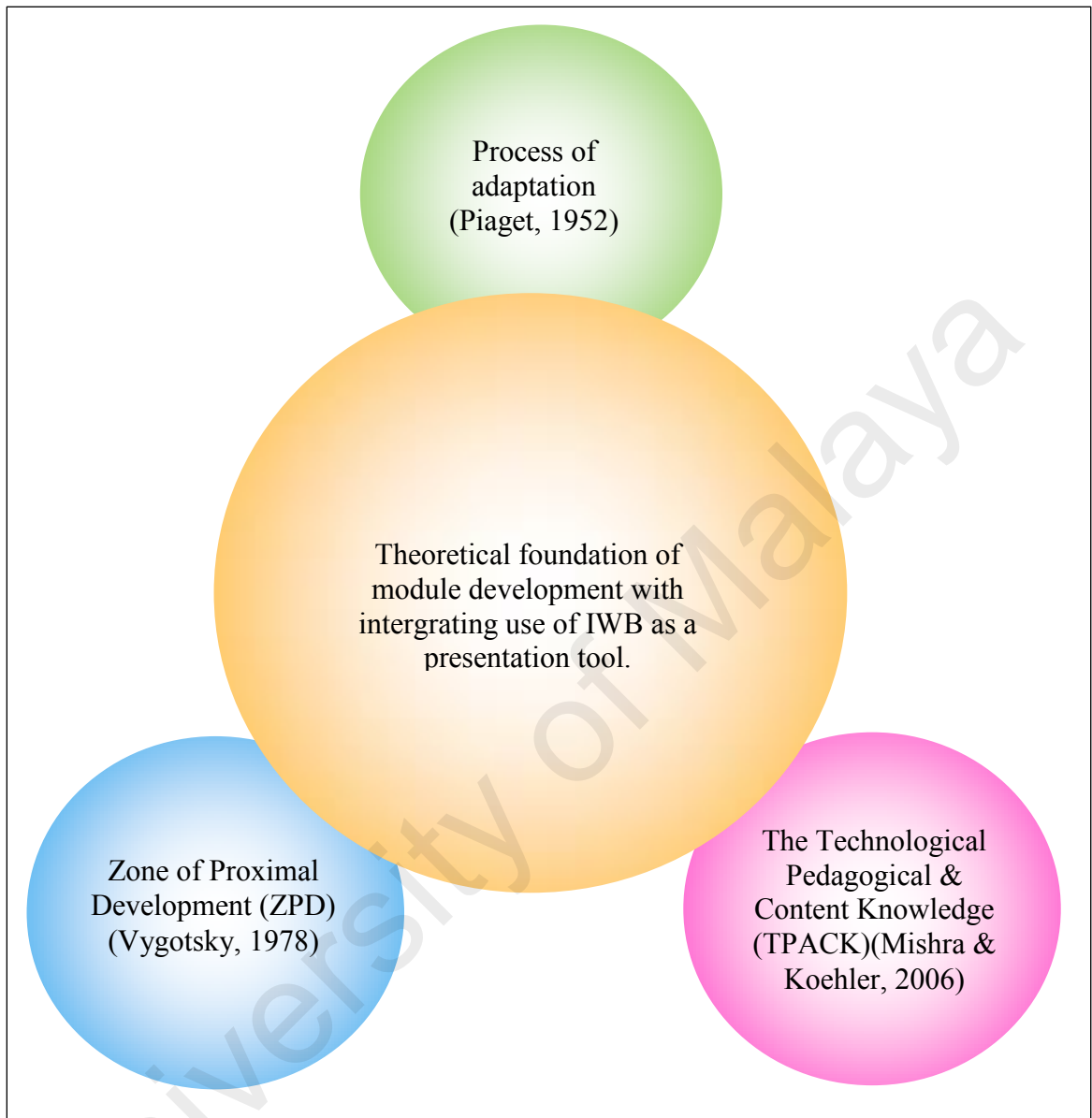
Figure 2.2. *Theories underpinning this present study*

Zone of Proximal Development (ZPD)

Vygotsky's (1978) viewpoint is that social communication is essential to learning. In addition to that, as cited by Schunk (2000), Vygotsky emphasizes that social interactions are vital to learning, that he is in favor of designing curricula that focuses on

the active role students must play in the learning process. He had mentioned, "that instruction is most efficient when students engage in activities within a supportive learning environment and when they receive appropriate guidance that is mediated by tools" (p. 231). Tools used in social interactions are internalized to allow for a change in the cognitive process (Brunings, Schraw & Ronning, 1995). For instance, the introduction of tools like the Interactive White Board as a presentation tool will allow the learners to adopt and actively interact with one another as a group.

The community of learners creates groups and explores the potentials available on the Interactive Whiteboard to enhance their presentation skills. There are many technological tools available for integration in the classroom as cognitive strategies such as the computer-supported interactive whiteboard. Glover, Miller, Averis, & Door (2007, p. 17) state that through the use of the IWB, teachers "become more aware of the nature of interactivity and its stimulation as the basis for conceptual development and cognitive understanding".

On the whole, as claimed by Underwood & Dillon, (2011) a module integrating the Interactive Whiteboard will be of a great use if it is adopted with appropriate pedagogical facet and apt instructional design. Besides, the Interactive White Board also creates a hands-on opportunity with multimedia expedients (Smart Technologies Inc., 2006). Therefore such pedagogical approach enhances student interaction as well group learning (Beeland, 2002).

This constructivist approach to learning which theorizes that learners construct new meaning and understanding from a synthesis of both their prior experiences and new information through exploration, inquiry, and social interactions also underpins technology, and, more specifically interactive whiteboard, use in the classroom.

Computer-supported learning permits the construction of knowledge through peer collaboration and instructional scaffolding as cited by (Dewitt, 2010).

Several academician, have recommended that technology integration in classrooms have brought about new approaches to delivery of lessons in classrooms and transformed the teaching approach from a teacher–centered approach to a constructivist model of teaching (Becker & Ravitz, 1999; Cronje, 2006; Levin and Wadmany, 2006; Rakes, Fields, & Cox, 2006). The transformation in the teaching pedagogy from a teacher led classroom to a student centered approach is a prominent feature of constructivist model. The common characteristic of the student –centered approach is to empower the learners where the teacher plays the role of a facilitator in guiding students to accomplish the given task.

The educator takes a lesser dominant role and encourages the students to acquire knowledge using self- exploratory and independent learning approach by connecting their learning experiences with their prior knowledge and the new gained ones. Vanatta and Fordham (2004) carried out a study with 177 teachers about their perception incorporating technology and promoting blended learning approaches in classrooms. The study discovered that the respondents can be divided into two opposing pairs of major teaching beliefs.

The first group of participants had a differing view on constructivist and conservative teaching approaches. On the other hand, the second group of teachers had an opposing view in terms of their module development and carrying out lessons based on teacher-centered rather than student-centered approaches. The study also found that willingness to change was a large factor in a teacher's attitude toward technology integration. The findings from the study have highlighted that teacher–readiness to

accept and bring in transformational teaching and learning approaches are based on two factors which are extra hours allocated for teachers to explore these new technological tools and given adequate training on technology integration in classrooms.

Becker and Ravitz (1999) established a relationship among evolution of constructivist educational beliefs and utilization of computers in classrooms. These academicians conducted a study on 726 educators from 153 learning institutions comprised of selected schools from in The National School Network that has obtained monetary aid for fast-speed Internet access from the state government in 1995. The survey was equally distributed to elementary, middle, and high school teachers. Teachers who were identified as frequent Internet users completed a follow-up study that measured changes in constructivist practices. The survey results indicated that teachers who frequently used the Internet demonstrated more constructivism-based activities compared to other teachers.

In addition, he also highlighted that elementary teachers reported the biggest change toward constructivist practices than any other group. Secondary education teachers demonstrated the strongest correlation between constructivist practice and their use of computers.

The most important revelation from the study was the similarities shared by the teachers moving toward constructivist pedagogy. They had access to the Internet for a period of at least three years, were willing to discuss subjects in which they lacked expertise, managed multiple activities during class time, assigned long and complex projects for students, and gave students greater choice in the tasks and resources used to

complete their projects. The teachers also promoted more student productivity and were willing to allow students to engage in discovery-based education.

Ravitz, Becker, and Wong (2000) led a nation-wide survey among 4,038 teachers to identify if there were similarities with their views about teaching methodologies with their current classroom instructions. The instrument used for the study was based on three classrooms related practice namely the teaching, learning, and computing (TLC) to conclude whether these teachers desired constructivist teaching approaches in when preparing their respective lessons.

The outcome of the survey had indicated that a huge number of teachers opted to teach using constructivist approach, however due to constraints from the learning environment and the administration , these educators were not allowed to follow and adopt the desired approach. Therefore, these educators decided to implement a more conservative teaching approach which enables the teachers to complete their syllabus in the shortest given time (Ravitz, Becker & Wong, 2000).

Levin and Wadmany (2006) led a long-term study that concentrated on the development of educators' opinions of the main domains of instructional technology which are acquiring knowledge, pedagogy and technology, and its connection with their classroom practice. This research involved six teachers who handled learners from the fourth and sixth grades focusing on ways they incorporate technology into their learning environment and selection of relevant activities and submission for these group of learners. Data was obtained from observations, conducting interviews and giving out survey forms on teacher's perception of the impact of integrating technology in classrooms. After several of years of analyzing the usage of instructional technology, the

academicians have discovered that educator's teaching approaches have transformed drastically.

The major shift in the given teaching materials was the type of activities and handouts that centers on student-led tasks and lesser dependent on teacher's involvement in the given assignments. Based on the data obtained from the studies, even though there was a shift in teaching practice, some teachers' perception of technology integration in classrooms and its usage remained unchanged.

In conclusion, this study has identified that it is more convenient to transform classroom practices with technology as compared to a educators perception on teaching with technology. Additionally, Kitchenham (2006) carried out a study on the influence of professional development together with the shift in the knowledge acquiring process impact the adaptation process of teaching with technology. This study was conducted among 10 teachers. It centered on the changes that have taken place after these teachers have incorporated the newly gained knowledge into their classrooms after attending Professional Development programmes. Reflective journals, survey forms, semi-structured interviews and field notes were instruments used to obtain data for this study.

It is shown that after attending Professional Development programmes on technology integration approaches, these teachers are more inclined towards constructivist teaching approach. As these teachers become confident and familiar with technology integration methods, they develop a liking towards adopting technology in classrooms without much hesitation. In conclusion, the study has indicated that teachers are willing to move towards transformational teaching approaches focusing on student-centered teaching approaches after given adequate training and provided with sufficient technological support.

According to Choi and Ramsey (2009), a study was conducted among pre-school teachers to analyse the connection between their perception, behavior and pedagogical approach and its influence in their classrooms after attending a summer science programme.

This study was carried out among 14 elementary teachers at two different points, once before the commencement of a three-credit summer programme and another round upon completion of the programme through surveys and a case study approach.Based on the findings of the study, a large number of elementary teachers have shown enhancement in their classroom practices and have shifted their pedagogical belief towards constructivist approach. Therefore, as highlighted from this study, that proper training needs enable teachers to bring about the desired impact in an optimistic manner into their learning environment.

According to Vygotsky (1981), teachers play a vital role in enabling students to comprehend new knowledge and to achieve a certain level of mastery of knowledge. New knowledge is transferred through guides such as discussions with students and by the trainer who had trained the lecturer and students on the usage of the Interactive Whiteboard as a presentation tool. In addition to that, he had highlighted on the interaction with more capable peers and adults or more knowledgeable other MKO's to assist in students' creativity and imagination.

Sharp (2004) had also suggested that active social interaction between adult and students in enhancing their knowledge, creativity and imagination among them is beneficial. Apart from that, Becta Publication, (2003) refers to the usage of IWB as a medium of instruction as a valuable learning tool because it enables the teacher to emphasize on a particular structure by highlighting, circling or using different colours

enabling the students to be able to systematize new concepts in integrating the Interactive White Board as a presentation tool.

The module developed using the Interactive White Board as a presentation tool will serve as a guide to teachers to appropriately design and execute the integration of the Interactive White Board to be used as a presentation tool among foundation students. The role of teachers in the scaffolding process allows the learners to move from one level of ZPD to another level of creative presentation with the integration of the Interactive White Board.
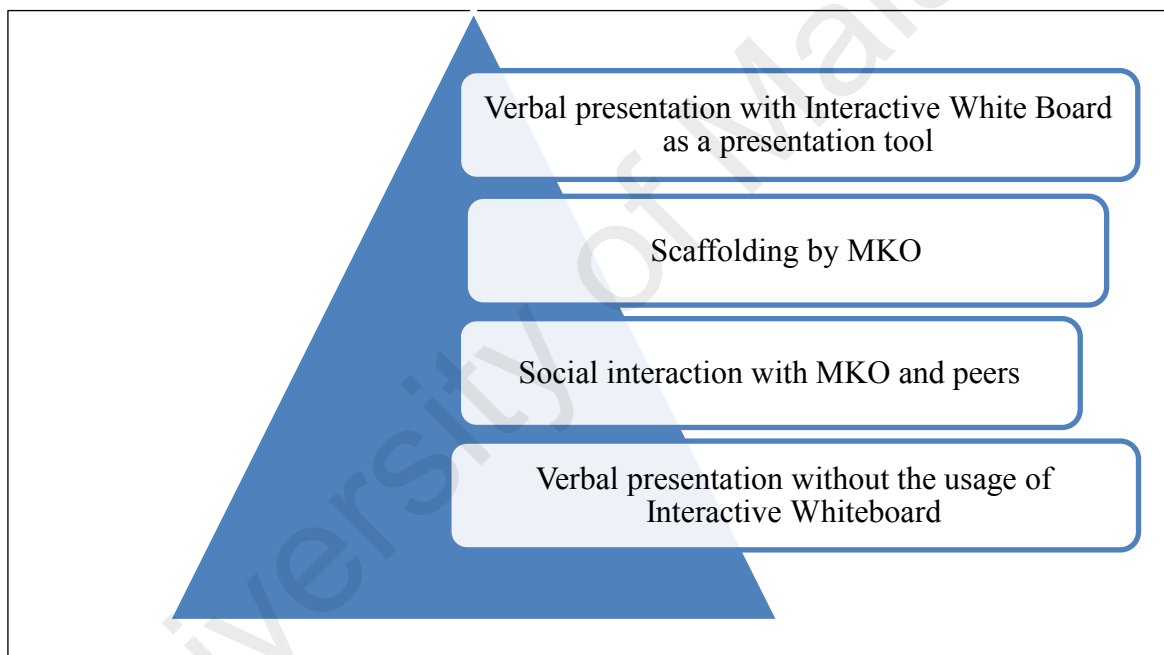
Figure 2.3.*Zone of proximal development in the context of the present study.*

Adaptation Process

Constructivism, as a philosophy of learning, is a combination of the tenets of Dewey, Piaget and Bruner, among others. Piaget (1952) highlights two major methods that form the adaptation process. As students or learners engage themselves with

presentation tasks, they assimilate by taking in new ideas or notions and relating or linking them with current schemas, although simultaneously accommodating by restructuring old and new thoughts when their current thinking structure cannot adapt to the new situation.

Therefore, the interaction of the new and existing knowledge on presentation skills for the module developed using the Interactive White Board benefits the students as they can use their prior knowledge on presentation skills and enhance their skills further by adopting them by integrating the use of the Interactive White Board in various ways like using presentation tools built into the interactive whiteboard software to enhance their learning materials and showcasing their presentation skills as mentioned by Turel (2011).
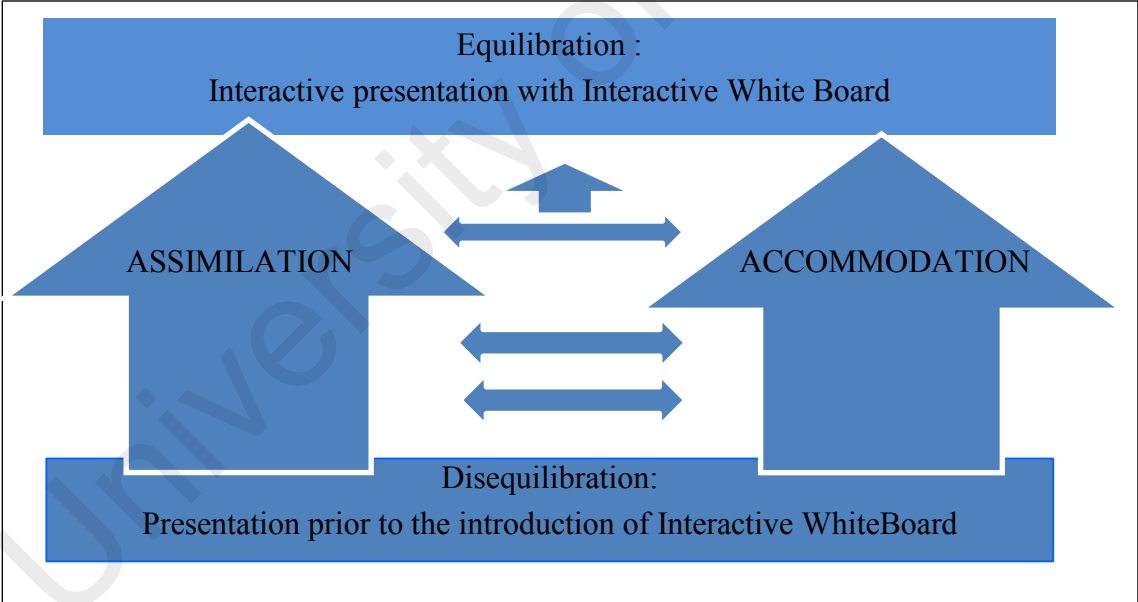
Figure 2.4. *Assimilation and accommodation as two main interplay methods toward developing an interactive presentation.*

Piaget's theory illustrates that assimilation and accommodation could enhance learners' presentation skills and produce more interactive presentations. The adaptation method is derived from a thinking struggle which is due to disequilibrium, when the current schema conflicts with the new schema through the continuous process of where a learner organizes and modifies the existing schema through the process of assimilation and accommodation, thus moving from a state of disequilibrium to equilibrium. This interplay between the methods will lead to the production of interactive presentations with the Interactive White Board (Piaget, 1960, as cited BECTA (2002).

The Interactive Whiteboard supports communication and exchange of ideas as a new roadway for class presentations (Ayetec, 2013). Piaget's theory was chosen due to certain strengths such as it promotes active participation, a requirement for social interaction, individual's ability to learn to adapt to new skills or knowledge and support thinking out of the box (Webb, 1980). Therefore, Piaget's theory was picked due to its forte which is relevant to the process of module development. For this study, the foundation students will be required to conduct a presentation using the Interactive White Board.

The teacher's role is that of a facilitator who assists students in constructing knowledge through dialogues, questioning, guided learning activities, and discussion. These students will be introduced to presentation skills during the lecture and several rounds of presentations will take place during the tutorial. Two training sessions were conducted to introduce the Interactive White Board software to the students and these students will be required to present using the Interactive Whiteboard based on presentation tasks given to them.

Becta Publication, (2006) refers to the usage of IWB as a medium of instruction by using presentation tools built into the interactive whiteboard software to enhance learning materials because it enables the teachers to get their students to be able to systematize new concepts and improve presentation skills. Efficient use of technology by educators is essential to successfully enhance student learning (Mishra and Koehler, 2006).

According to Smith (2001), the Interactive Whiteboard frees the teachers from the time-consuming task of preparing materials. Apart from that, the findings also indicated that the teachers agreed that they could save the lesson for future use and cut down preparation time for future use. Constructivism learning theories support the focus on the learner who actively participates in the learning process by engaging in meaningful experiences. Beeland (2002) advocates that the Interactive Whiteboard is a powerful communication tool for students regardless of their accessibility from computers. Additionally, Marzano (2009) too found an increase in student achievement especially in learner response device, use of graphics to represent information and reinforce correct responses. In an active learning environment, students acquire knowledge through linking prior knowledge and new information. Alexiou-Ray, Wilson, Wright & Peirano (2003) advocates that use of interactive whiteboards "emphasized a more constructivist approach in which students are actively learning with "real world" implications" (p. 73).

Furthermore, constructivist instructional design emphasizes collaboration and student-centered learning while attributing individual responsibility for comprehending information. Learning with Interactive Whiteboards in the classroom allows for effective student retention and ultimately improves performances among learners. Zirkle, (2003) carried out a study and the findings indicated that lessons with the Interactive Whiteboard

allow for positive grade change for assisting functional Mathematics achievement with slow learners. Moreover, constructivist theories of learning comprise the environment and requirements of the learners themselves. These theories center on the diversity of learning styles within a group, the developmental stage of the learners, and the attitudes of the learners and module development.

Therefore, the concepts of interactive learning, student motivation and engagement will be examined within the context of the empirical literature review. The awareness of concentrating on content knowledge and pedagogical techniques is not uncommon. Shulman (1986) recommended that the two entities should focus on the intersection of these two divisions. Furthermore, the intersection enables researchers to ascertain areas involved in excellent teaching approaches. Pedagogical content knowledge includes the multifaceted interactions between teaching the given material, initiating content specific examples, and providing the material in a way that is understandable to the target audience. This unique interaction holds the key to outstanding teaching methods.

Technology Pedagogy and Content Knowledge (TPACK) framework

Since the initiation of pedagogical content knowledge, researchers have adjusted, critiqued, and revised the original idea and realistically adopted its approach into various fields. Currently, with the inflow of technology in the classroom, researchers have included technology content knowledge to Shulman's (1986) idea of pedagogy and content knowledge.

Technological pedagogical content knowledge (TPACK) was created on the foundation of pedagogical content knowledge and also focuses on unique ways for educators to

effectively integrate technology in the classroom as cited by Mishra and Koehler (2006)

View (Figure 2.5)
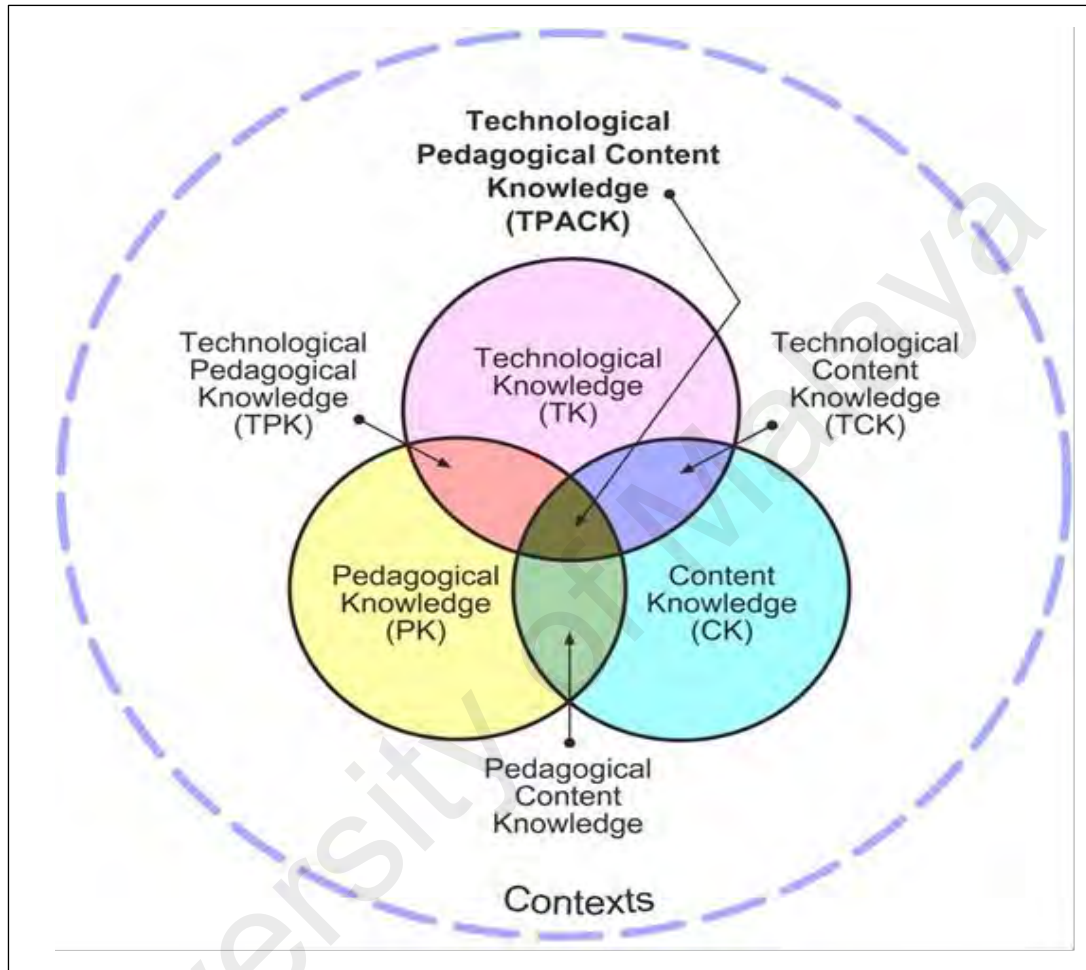
Figure 2.5. *TPACK framework*

The TPACK framework is an outcome of a continuous research by Mishra and Koehler (2006). The researchers found that not only did teachers develop content-specific examples and translate the material for the audience, but they also had to understand and adapt their approaches with the use of classroom technology. Additionally, technology

adds more to the density of the instructional technology approaches. This intricateness has also led to an increase in awareness among educators on the use of instructional technology and connecting with the teachers' understanding of content and pedagogical methods.

TPACK framework focuses on the intersection of Technological Knowledge, Content Knowledge, and Pedagogical Knowledge. Each area of knowledge contains valuable materials for teachers to practice on a daily basis. During teaching, teachers take information from all three of these areas to execute their lessons, provide content specific examples, and use technology to further enhance the classroom contents. Technology Knowledge is the body of knowledge that educators use to interrelate with a range of technologies. A variety of technology is available for teachers to adapt and integrate into their respective classrooms. Some innovative instructional technology approaches that use computers and Interactive White Boards necessitate specified advanced-level expertise that requires training. Before teachers can use the Interactive Whiteboard, they must understand several approaches to interact with it. In order to integrate the Interactive White Board in a classroom, the teacher needs to acquire appropriate skills like the use of the mouse and keyboard.

The Interactive White Board requires the same skills that a teacher has already developed with the use of the computer, but also contains an intricate display of characteristics that are only pertinent to the Interactive White Board from the interactive software and other related tools available to enhance the interactive usage of the board. After acquiring the user interface of these devices, the teacher needs to learn on ways to use the software that often comes with the computer or Interactive White Board.

Mastery of the software, the ability to navigate the Internet efficiently, ways to install and remove devices, and to find and save files to be used with the Interactive White Board are all essential skills that need to be developed when using Interactive Whiteboards.

Due to cutting-edge technologies like computers and Interactive White Boards which are intricate and new technologies that are being integrated into classrooms every few years, the technique of learning these technologies reduces the valued time that educators would devote to developing their content and pedagogical knowledge.

Content Knowledge is the knowledge that is attained by specializing in a given content area. In most higher learning institutions in Malaysia, educators are experts in a content area and are in control for teaching and the preparation of teaching material. These educators are considered subject matter experts and have the ability to naturally connect facts and generally accepted concepts. The grade level of the course content usually commands the depth and breadth of the content. Most of the time, educators will relink materials that were acquired in earlier grade levels to deliver a relevant connection to the material (McDiarmid & Ball, 1988).

Pedagogical Knowledge is the information that teachers practice in the classroom to expedite teaching and learning. This knowledge includes concepts of classroom management, learning constructs, and an understanding of the educational environment as a whole (Koehler & Mishra, 2008). Individual and group assessments are important parts of pedagogy .Pedagogy allow teachers to look for specific performance indicators in their students' work. Pedagogy also includes educational theory and strategies for delivering the material. Teachers who have strong pedagogical skills know what

motivates students in their classrooms. Pedagogy knowledge gives the teacher the ability to develop appealing lesson plans and accomplish intended learning outcomes.

Technological Pedagogical Knowledge is positioned at the intersection amid technological knowledge and pedagogical knowledge. Pedagogy also includes educational theory and strategies for delivering the material. For this research, the ADDIE model was selected as guidance in developing the interactive presentation module. For instance, an example of this type of knowledge would be the lecturer using introduction presentation skills and providing samples of interactive materials during the lecture to assist students in creating an interactive presentation.

The teacher combines the knowledge of available tools in the Interactive White Board software with the pedagogical knowledge in particular on presentation skills. Later, students are required to form small groups in order to encourage peer support and collaborative learning environment as students will be required to conduct their presentation in small groups.

Technological pedagogical knowledge enables the teacher to lookout for appropriate technology and integrates according to its suitability of the classroom requirement as mentioned by Barbour, Reiber, Thomas and Rauscher, (2009). The Technological Pedagogical and Content Knowledge (TPACK) framework which further explores on the multifaceted nature of teacher's knowledge also emphasizes on the teachers way to foster knowledge from the three key areas as cited by Brush and Saye (2009). Using the framework of TPACK to develop technology integrated modules is strongly recommended as it is a resourceful way to promote technology efficiently in a classroom to enhance the learning process. A study done by Pflaum (2004) has cited that

when teachers are put in an environment that supports and emphasizes the usage of technology in a learning environment.

The findings highlighted that any educators who are placed in this type of setting will have the tendency to adapt very quickly and confidently to new approaches to integrating technology into classrooms. In addition, these educators develop their capabilities in their individual spaces and create modules using technology in their learning spaces willingly. Moreover, when these educators are in a learning atmosphere that uses the Interactive White Board for the teaching and learning process, they have the inclination to develop the teaching materials using the Interactive White Board without much hesitation. In conclusion, when teachers are placed in a supportive environment with relevant technology, creating innovative lessons that integrate technology in classrooms becomes a norm and done with ease.

To develop TPACK knowledge, the modules are needed to be centered in the environment and focused on the content area that the teacher delivers in the classroom (Koehler, Mishra, Hershey and Peruski, 2004). Hofer, Grandgenett, Harris, & Swan, (2011)found that teachers who incorporate the TPACK framework are more likely to integrate technology in their classrooms with students' content-related learning needs with content-based learning examples. Furthermore, as highlighted by Koehler, Mishra, Hershey, & Peruski (2004) the TPACK framework is essential in directing and leading teachers to develop relevant lesson plans and modules that help teachers to choose a suitable technology to, assist with selection of technology to heighten the anticipated learning outcome.

Moreover, a lesson or subject that is planned centered on TPACK understanding focuses on the outlining of teaching related instructions and lessons which are established

on a precise classroom setting and requirements, to be precise, on specific subject matters that an educator manages that requires exploration of the content knowledge that specifically needs to be addressed based on the learners need in a particular classroom. For instance, a teacher would want to identify an innovative pedagogical approach to incorporate a web base lesson into the classroom practice can focus on the interplay of pedagogy and technological knowledge into the classrooms. For instance, a teacher may have difficulties managing the appropriate number of activities and at the same time managing time and monitoring if students are able to complete the given task.

Since, these teachers have been attending a professional development that aimed on pedagogical aspect that supports the integration of technology and were introduced to a website that has a timer, they were able to balance their teaching materials well and the website not only supported better learning engagement among the students but also was used as a solution for proper time management. Harris and Hofer (2008) have also cited that an additional plus point of using TPACK is that it supports the development of modules or curriculum that allows for an interplay of technology and content- delivery.

Additionally, he states that educators are comfortable and become more confident when instructional technology related training emphases on the relationship between the learner's needs and the intended outcomes for the specific module. Additionally, educators tend to look out for support from their peers when they intend to create and explore innovative pedagogical approaches. Unlike other widely known technology frameworks like the International Society for Technology in Education (ISTE) NETS-T 2000 Standards (ISTE, 2000) and Levels of Technology Integration (LoTI) (Moersch, 2002), which are very precise on educational technology integration, TPACK focuses on

the combination of technology, content, and pedagogy to cover the teacher's overall classroom goals.

Summary

This literature review has looked into the links between interactive whiteboard use and a variety of topics relevant to the use of this technology and student engagement in classroom instruction. The concepts of social cognitivism and constructivism were introduced as the related learning theories and the incorporation of the TPACK framework to enhance the relationship of the three intersections of the framework with the relevance of the integration of the Interactive Whiteboard in the classroom. In addition to that, other learning theories related to the issues are interactive learning and learning styles and student enhancement. Findings from various studies have revealed several major benefits of integration of the Interactive Whiteboard in classrooms include collaborative learning, active participation, and student-centered approaches. Furthermore, studies have suggested that the usage of interactive whiteboards increases student interest and attention leading to improved motivation and engagement during lessons.
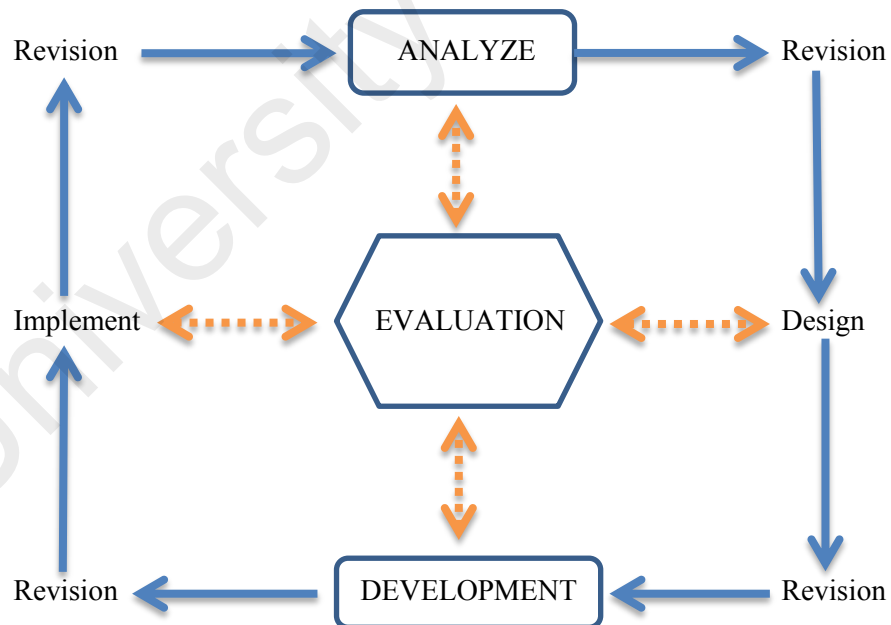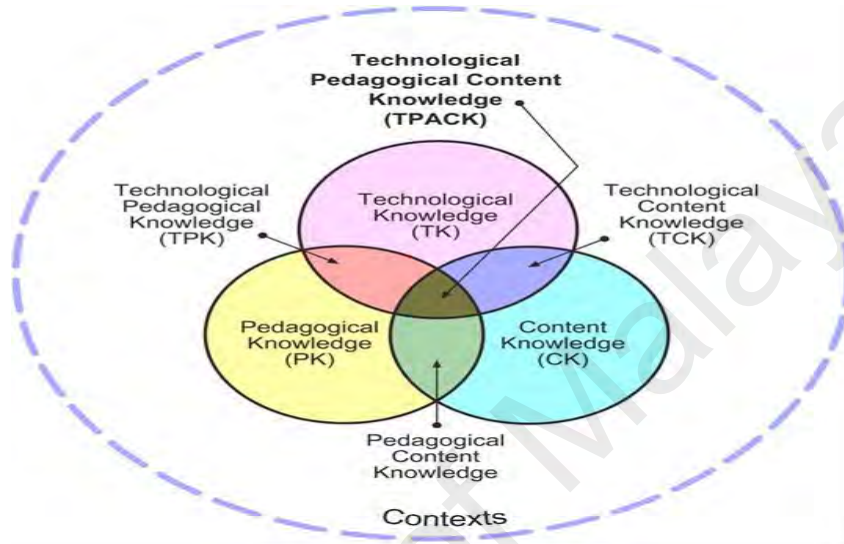
Figure 2.6: *Theoretical framework of the study.*

CHAPTER 3 METHODOLOGY

Introduction

This chapter comprises the description and discussion of the methods used to conduct this study, the research design, participants, instrumentation, procedures, and data organization and analysis. This research attempts to address development process as cited by Wang and Hanafin (2005). This study will be separated into numerous stages which include analysis, design, development and evaluation (Wang and Hanafin, 2005 and Norlidah Alias, Saedah Siraj, Mohd Nazri Abdul Rahman and Dewitt, 2013). The research methodology of the stages is outlined in this chapter.

This study can be divided into three phases as outlined using ADDIE's Model. The first stage aims to explore the needs and the problems in the current implementation of classroom presentation from the point of view of the Programme Director and a lecturer. In addition to that, a survey will be carried out among foundation students to express their opinions on the use of computers and Interactive White Board in teaching and learning in the context of the study.

The second stage involves design and development process of the module according to the themes obtained from the needs analysis phase and expert's opinion and is followed by the development and designing of a module to be used on the Interactive White Board. The later stages involve the implementation and evaluation stages. At this section, the module prototype will be developed from the second phase that will be implemented.

Usability of the module will then be evaluated after the implementation of the module. In the subsequent parts of the chapters, sample selection, methodology and procedure for data collection for each stage will be described.

The research design used in this study is on development research, a variety of methodologies will be used in different phases. All interview questions were adopted from Chin (2010), Ph.D. thesis. The needs analyses survey was taken on from a doctoral study conducted by Dewitt (2010), and the two sets of survey questions that used for the quasi-experiment were adopted from another doctor study done by Morgan (2008).
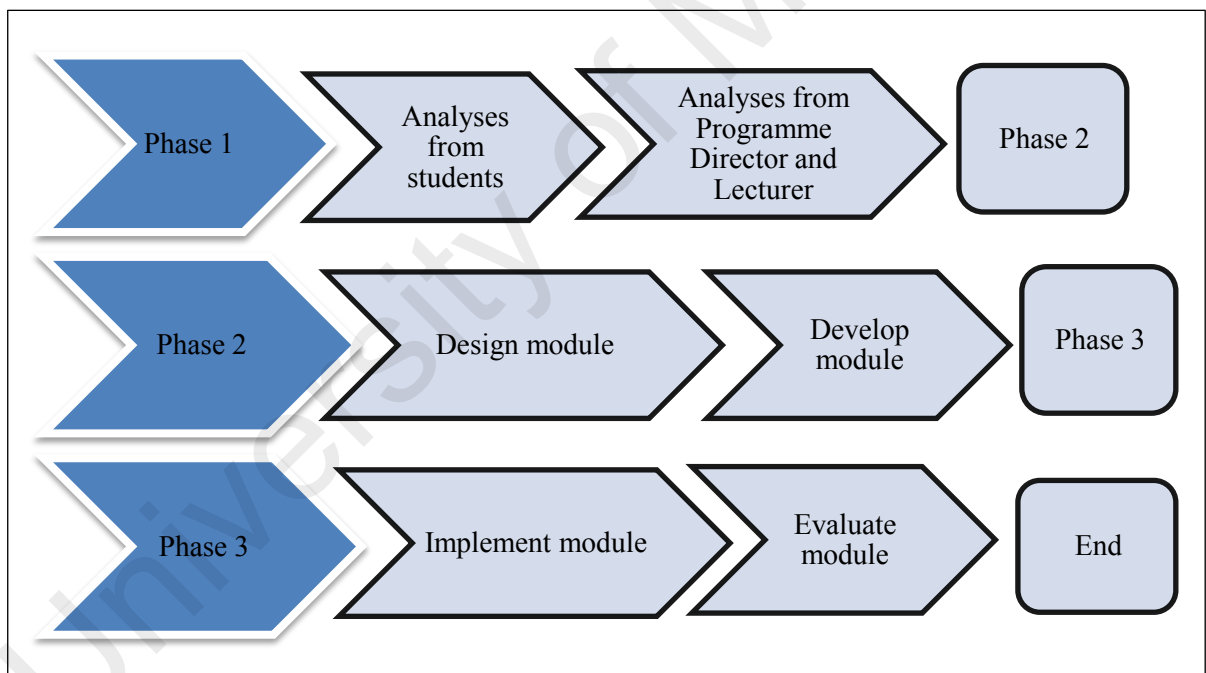
Figure 3.1: *Summary of stages in the developmental research*

Phase 1 Needs Analysis:

The first phase of this study is aimed to explore the needs and the problems in the current implementation of classroom presentation from the point of view of the students

and followed by the Programme Director and another architecture lecturer. This analysis phase is conducted at the beginning of this developmental research where information on the content and setting is obtained. Based on the suggestions given and solutions obtained from the analyses process, the integration of the new technology will be done as suggested by Rosett (1995).

In this phase, the research questions about students opinion of the use of computers and the Interactive White Board in teaching and learning in the context of the study which done through a survey. Furthermore, an interview on the needs and the problems faced in the current implementation among the teachers during a presentation session in a foundation classroom will be carried out. Hence, the findings from the module will also be analysed as it will provide necessary input for the subsequent stage.

The students are of mixed ability levels or in advanced classes. These students entry requirement for the module is a minimum of 5 credits from the Sijil Pelajaran Malaysia (SPM), a national exam in Malaysia. There is gender diversity in each class, plus a mix of ethnicities: Malaysian Chinese, Indians and Malays together with several international students from the Middle Eastern countries, and other continents. Additionally, most of the students also come from a variety of socio-economic backgrounds. There will be two groups of students who will be the focus of this study. One is the experimental group which will be involved in the investigation as the students in this classroom will be using the Interactive White Board to conduct a presentation. The other group will be the control group where the students will be using the Power Point slides to conduct the presentation. These group of students a needs analysis survey will be conducted. (Refer to Appendix A)

Instrumentation and Data Collection Procedure: During the needs assessment stage, data was a survey was also administered among students to gain their point of view about using the formative evaluation process and a semi structured interview (refer to Appendix B) will be used to gather information. In addition, data was also collected from the informal interview session conducted with the Programme Director and another lecturer of the school. These respondents will be probed to provide more detailed feedback about the module with the integration of the Interactive White Board during the interview session.

Study setting: The study was conducted at a private higher learning institution in Malaysia. A purposive method was used to select the subject of the study. The subjects of the study were students from semester 1, foundation programme. These students were studying English 1, which is a semester 1 module. All students will be required to conduct a presentation and a study using the Interactive White Board. They were required to attend two rounds of training, once by the vendor and another round by the researcher who has experience using the interactive whiteboard as a presentation tool and on module development. The assessors of the module comprise of three subject matter experts who have prior knowledge and experience using the Interactive Whiteboard in their respective classrooms.

These lecturers agreed to participate in the study due to their personal interest, familiarity with, and enthusiasm for the interactive whiteboard use as an instructional tool. For this study, two groups of semester one students were chosen and observed. The control group will be required to use the Interactive White Board as a part of their presentation for their given task while the non-control group, a similar task will be given

to this group but they are not required to use the Interactive Whiteboard for their presentation.

Selection of contents of the topic: The rationale for choosing the topic was made based on literature review and the researcher's experience as explained in this section. The choice of content will be on interactive presentation using the Interactive White Board as a presentation tool to enhance the presentation in a foundation classroom. Another added feature of the Interactive White Board (IWB) is that the teaching is aimed at usage for the whole class instruction. Furthermore, these boards let students to be interactive with each other, the teacher, and the board utilizing visual, verbal, and tactile modalities as recommended by Isman , Abanmy , Hussein and Al Saadany (2012). They can also incorporate a range of multimedia and other digital resources to enhance content; support interactive and collaborative learning; and, foster student control of learning.

Best practice literature supports interactive learning to engage students and to encourage higher order thinking and problem-solving skills (Winzenri , Dalgarno and Tinkler, 2010). The interactive presentation is gaining popularity in many fields including in the field of Architecture. For instance, Case (2012) had mentioned that English for architects is perhaps the most neglected kind of ESP (English for Specific Purposes). Architects need English for various reasons such as for verbal presentations and written essays.

In the new millennium, architects have to face new challenges where they are expected to be more versatile and equip themselves with language and soft skills. Inman (2006), Esa Samad (2000), Reedy (2008) stated that IWB supports "presentational approach to learning". Hennessy (2011) had highlighted that IWB can influence the

audience and engage the whole classroom as IWB is used as a discussion tool during the delivery of a lesson or used for presentation. Furthermore, it allows for a good grasp of materials and supports good classroom control at the same time.

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┌─────────────────────────┐         ┌─────────────────────────┐
│ Analysis of viewpoints  │         │ Analysis of Programme   │
│ of learners             │         │ Director's and          │
│                         │         │ lecturer's views        │
└─────────────────────────┘         └─────────────────────────┘
            ▼                                   ▼
┌─────────────────────────┐         ┌─────────────────────────┐
│ Students perception on  │         │ Teacher's use of        │
│ usage of Interactive    │         │ technology              │
│ White Board and         │         │                         │
│ power point slides for  │         │ Teacher's perception on │
│ presentation            │         │ interactive presentation│
└─────────────────────────┘         └─────────────────────────┘
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┌─────────────────────────┐         ┌─────────────────────────┐
│ Identify needs and      │         │ Identify current        │
│ problems                │         │ problems and needs      │
└─────────────────────────┘         └─────────────────────────┘
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┌─────────────────────────┐         ┌─────────────────────────┐
│                         │         │ Interview               │
│ Conduct a survey        │         │                         │
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│                         │         │ analysed                │
└─────────────────────────┘         └─────────────────────────┘
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        ┌─────────────────────────────────────────┐
        │ Findings and conclusion                 │
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        │ Suggestions on the design of the task   │
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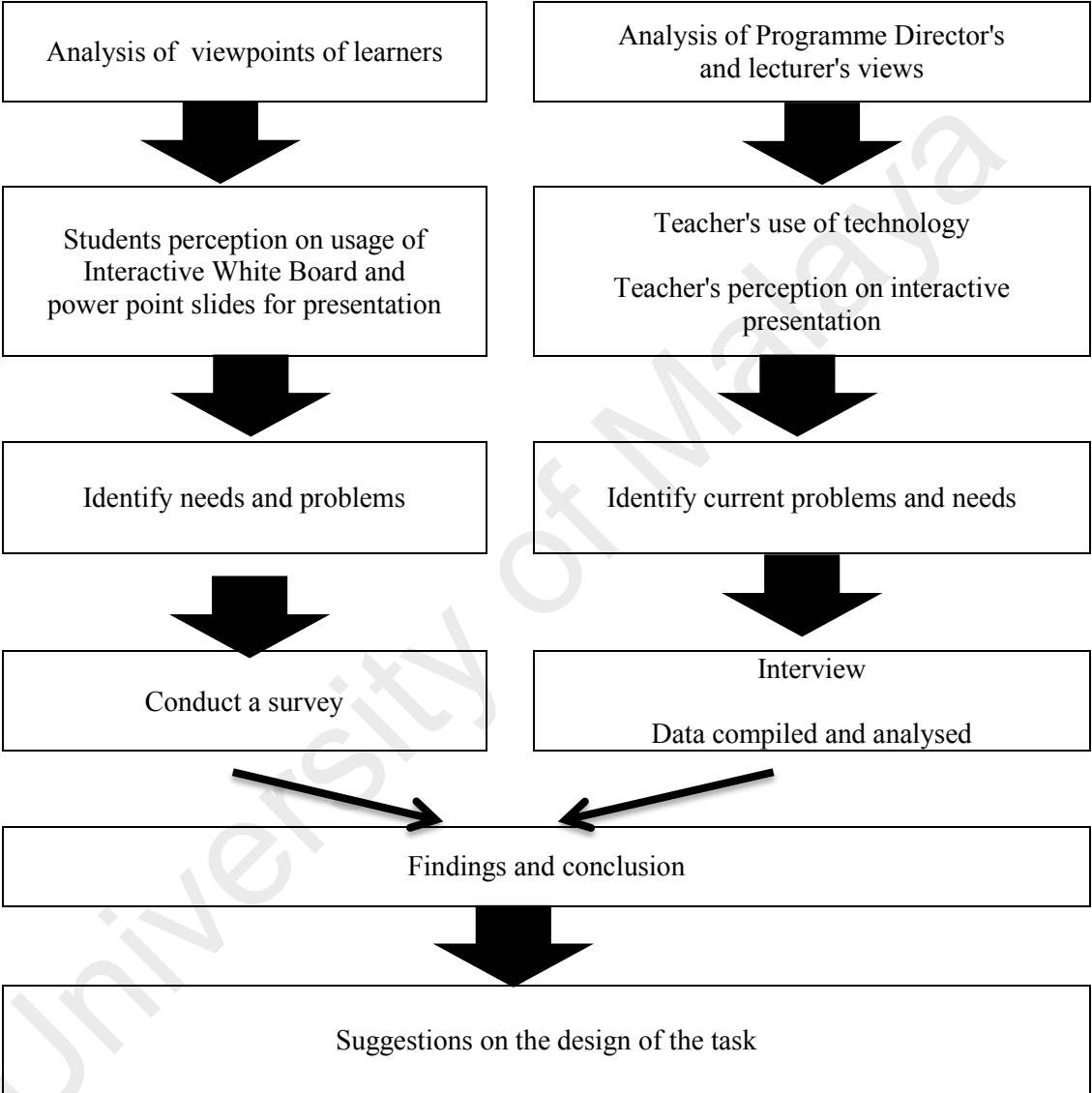
Figure 3.2: *Research procedure in Phase 1: Needs Analysis*

Phase 2: Development of Research

The second phase of the study will be designed based on the findings obtained from the needs analysis phase. The focus of the analysis phase will be done to identify the relevant skills and knowledge required in the development of an interactive presentation module integrating Interactive White Board. This interactive presentation module will be developed based on "ADDIE" Instructional Design. Instructional designers and educators use the "ADDIE" Instructional Design (ID) technique as criteria from the development to the evaluation process as well as to monitor progress and usefulness of a particular project. "ADDIE" stands for Analyze, Design, Develop, Implement, and Evaluate.

The distinctiveness of this model is that it does not inflict a stringent linear progression between each phase; hence, each stage is a clear instruction on its own. Therefore, even if an individual uses ADDIE in the middle of the project, it will still maintain its value and is capable of offering a sense of structure to the whole module or project. Many educators discovered that this approach is very appropriate especially having stages that are evidently defined and makes implementation of instructions more efficient. According to Forest (2014) as an Instructional Design (ID), the Addie Model has found wide acceptance and use especially by the Armed Forces.
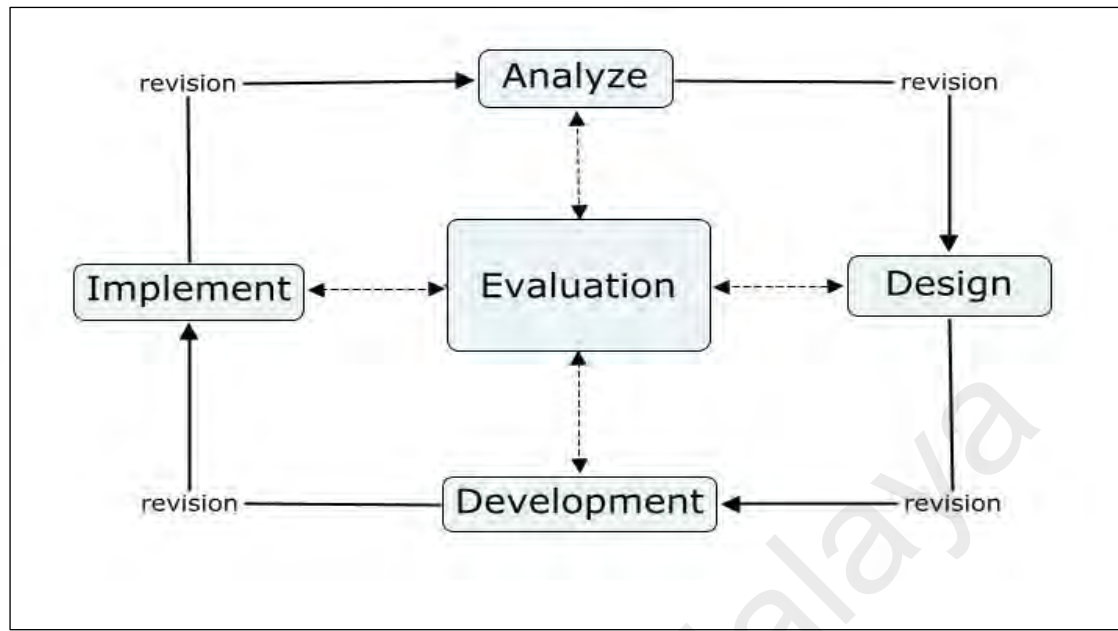
Figure 3.3 *ADDIE Model*

An informal interview with the Programme Director and an architecture lecturer will be conducted for the needs assessment phase together with a needs analysis survey with the learners. Findings from the interview and survey will then be analyzed. The designing and development of the module will be done based on the findings from the needs assessment phase. Gagne's Nine Event of Instruction (Table 3.1) will be used to deliver the instructions during the lesson. In his book "The Conditions of Learning," he emphasizes on the information processing model of the mental events that occurs when learners are presented with various stimuli, which will allow learning to take place.

Table 3.1

Gagne's Nine Instructional Events

1.Gain learners attention
2. Inform learners of the objectives
3. Stimulate recall of prior knowledge
4. Presentation of the contents
5.Provide "learning guidance
6.Elicit performance
7.Provide feedback
8.Assess performance
9. Enhance attention and transfer to the job

The nine instructional events will be used as a guide in the selection of the learning activities, the resources and the choice of appropriate media.

Gagne's Nine Event of Instruction (Table 3.1) will be used to deliver the instruction during the English 1 lesson. In his book "The Conditions of Learning", he emphasizes on the information processing model of the mental events that occurs when learners are presented with various stimuli, which will allow learning to take place as cited by Gagne, Briggs & Wager, 1992.

In addition to that, Gagne's Nine Event of Instruction enables the teacher to structure and keep track of students' progress. Apart from that, each step can serve as a checklist of before the delivery of a lesson (CITT, 2016).The nine instructional events

will be a guide in the selection of the learning activities, the resources and the choice of appropriate media.

The topic of this lesson will be on presentation skills. The title of this group base interactive presentation is related to professions on the built environment and their respective drawings.

Designing of Lesson: Interactive Presentation Skills based on ADDIE's model

The first stage, of the ADDIE model which is known as Analyses can be considered as the "Goal-Setting Stage" as suggested by Danks (2011). The focus of the designer in the analysis phase is on the target audience. It is also here that the module matches the level of the skills and intelligence each student shows to make sure of what they already know in order to avoid duplication of information but to focus on the learning of topics and lessons that are yet to be explored.

This phase discusses the module that the target learners are going to learn. Since the title of the module is Presentation skills, the students will be first briefed on the oral presentation skills which were derived from the English 1 foundation module that was designed by the researcher. The next step is to carry out Needs Analysis. It is incorporated in the design activities in order to identify the needs of the target learners. Therefore, an interview with the Programme Director and a lecturer will be carried out. Findings from the informal interview on the need to integrate the usage of the Interactive White Board as a presentation tool in a foundation classroom will be analyzed together with a survey done by the students on their perception of the usage of the Interactive White Board and PowerPoint slides.

The next step is to identify the student's background. The students who are involved in this study comprise of foundation English 1 students who had scored a

minimum of a credit for SPM English and for international students; IELTS of a minimum score of band 6 is required. Prior to introducing the Interactive White Board, students were given speaking activities in class for two sessions to encourage and build their confidence to speak in front of their classmates. Next, they will be required to attend two rounds of training, once by the vendor of the Interactive White Board and another round was conducted by the researcher. Then, students will be informed of the purpose and objective of this study.

These objectives specify descriptions to help the students to stay focus and achieve what is expected from the module. The focus of the research is to integrate the usage of the Interactive White Board as a presentation tool in a foundation programme for the School of Architecture, Building and Design. Hence, this module includes interactive lessons with the usage of the Interactive Whiteboard like viewing video presentations, using Power Point slides for presentations and using other interactive tools available on the Interactive White Board. Kristof and Satron (1995) mentioned that the design process of an interactive learning system can be separated into three elements, namely Information, Interactive and Presentation Designs, and together with the evaluation of a Module, can create an interactive learning atmosphere. Interaction Design focuses on guidance provided to users in order to familiarize them to scroll for any information that will be required while Presentation Design includes screen layout, background colour, font size as well as the use of graphs and animations.

Information Design: According to Danks (2011), the design stage determines all goals and tools to be used to measure performance, various tests, content matter analysis, planning and resources. Thus, at this level, all approaches should be done as planned

while following a very specific set of rules. This systematic approach makes sure everything falls within a rational and planned strategy in order to achieve the intended goal of the project. Every step planned should be given a through taught in order to achieve the targeted outcome of the design stage. In the design phase, the focus is on the learning objectives, content, subject matter analysis, exercise, lesson planning, assessment instruments used and media selection. The design phase needs to be specific. Each element of the instructional design plan must be implemented with attention to details.

The content materials will be developed using various software namely Multi-Touch Board Diver, Multi-Touch Board and Multi Touch Lite-Board during the students' presentation using the Interactive White Board software. It is simple and user-friendly software, and most of the teachers and students have already acquired the knowledge and skills in operating this software. This software was selected because its functions are similar to Microsoft Word. In addition, students will be required to obtain further resources from various online and print resources. This will also encourage any users regardless the teachers or students to create presentation materials which are interactive in nature.

Interaction Design: Interaction Design includes the aims and the learning outcomes of the lesson, the content and the clarity of instructions given. Evaluation of a Module deals with formative, which aims at refining the materials of a module, and summative, which measures the existing achievement. Therefore, this study is undertaken to explain the processes involved in designing the module using the Interactive Whiteboard.

The opinions of the experts with regards to the development and evaluation of this module using the Interactive Whiteboard as a presentation tool will be obtained through semi-structured interview and the findings will be discussed. In addition to that, a survey will be conducted among students to gain insight on student engagement behaviors in the classroom during interactive whiteboard use as an indicator of student engagement. The interaction design feature focuses on how students should navigate and use the features correctly.

In order to progress from one slide to another, the students need to either touch the page sorter arrow key or to touch the screen by moving the finger from left to right in order to move forward or right to left in order to move backwards. Hence a simple navigation would avoid uneasiness among the teachers and the learners because all the instructions are listed on the screen.

Presentation Design: In developing and designing this interactive presentation activity for the English 1 module, it was necessary to ensure that the layout and the interface were simple and constant throughout the learning process. The features which are given due consideration are the background colour, font type and size, icons, media elements and layout. There are two options available for navigation. One can either touch the arrow buttons or the screen from left to right to go forward and right to left in order to go back to the previous page.

The target audience will be informed of the objectives and the scope of the module that they would be learning. Besides, the knowledge and skills the learners would acquire after exploring the module and completing the activities are made clear through the learning outcomes. This is the second stage of Gagne's Instructional Events where

learners are enlightened about the objectives and the learning outcomes. This is done to create a level of expectation among the learner.

In the third stage of Gagne's instructional events, the learners recall their previous knowledge whereby they will be required to recall on the lecture notes on presentation skills. After going through the lecture notes on presentation skills and attending two rounds of training, students can proceed with creating their interactive presentation materials. Their presentation topic is about various professionals and the types of drawings involved specifically for each profession in the built environment industry. The learners can choose any sub-topic they intend to explore and to be presented during their presentation session.

The fourth stage in Gagne's instructional events presents new contents for the learners such as providing sample videos on effective presentation skills as well as other related resources that are available on the module folder on presentation skills. The fifth stage in Gagne's instructional events provides students the assistance in learning, where the teacher will help the students to further explore the topic and provide assistance in developing their interactive presentation materials during the practice sessions. Here, the teacher plays the role of the More Knowledgeable Other (MKO) to provide instructional support to students as a scaffold in order to encourage students to develop an interactive presentation module.

Designing the Interactive Presentation Module: The interactive presentation module involves the interaction between learners, peers and lecturers. An oral presentation task was given as a group based assignment to these learners. The social constructivist theory advocates that learning takes place through social interaction.

Hence, the interaction between given task, peers and the lecturer to create an interactive presentation module through scaffolding by providing demonstrations during the training sessions, examples and guide during their tutorial sessions. Through the scaffolding process, students will be able to relate their existing knowledge about oral presentation skills and adopt the new knowledge gained which is to include the usage of the Interactive White Board in order to produce an interactive presentation. The learning environment consists of the location of learning, interaction, logistics and policies, syllabus and course outline and the problem task which is interactive presentation module.
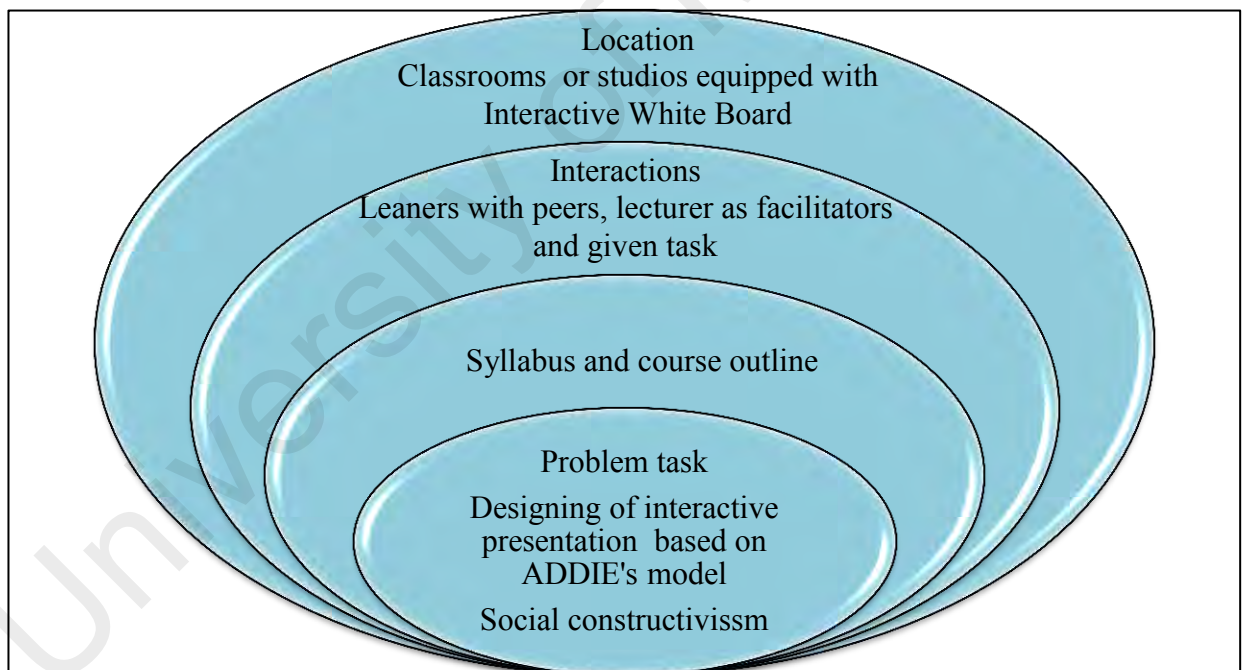
Figure 3.4: *Learning environment of Interactive Presentation Module*

Formative Evaluation 1: After the documents were completed, formative evaluation was led by a team of experts to identify items needed in designing the module by adopting ADDIE's model.

Participants of the study: The formative evaluation of the design process involves a five member-panel of experts. The purposive sampling method was used to select the experts for this study. The experts were selected because they were highly experienced and knowledgeable (Palinkas, Horwits, Green, Wisdom, Duan and Hoagwood, 2013). Two of them are technical experts who are post graduates in instructional technology who have the knowledge and skills in instructional design and three lecturers who will be invited to be subject matter experts have more five years of teaching language modules in foundation classrooms. The feedback received will be given due consideration and changes will be made accordingly. This approach was adopted from a doctoral study conducted by Dewitt (2010).

Selection of experts: The team of experts that comprise two technical experts and three content experts were selected based on their qualifications, working experience in teaching and learning with technology. A summary of the expertise of the experts will be discussed as follows. Technical expert 1 (TE 1) holds a Master's in Instructional Technology. She is currently working at the E-Learning Academy at a private higher learning institution. Her forte includes training lecturers to convert their classroom lessons into Massive Open Online Courses (MOOC). She has more than ten years of experience as a trainer in the field of instructional technology. The Technical Expert 2

(TE 2) has a Masters in Built Environment. He is actively involved in training lecturers at a private higher learning institution focusing on technology integration in classrooms. He is currently attached to a private higher learning institution in Johor Bahru and has seven years of working experience.

Subject Matter Expert 1 (SME 1) is attached to the Center for Languages at a private higher learning institution in the Klang Valley. She has a Master's in English Language and has taught foundation and degree students for more than seven years. She has experience in designing and evaluating teaching materials for the foundation and degree programmes. Subject Matter Expert 2 (SME 2) is attached to a Center for Languages at a private higher learning institution in Johor Baharu. He has a Masters in English Language and he has exposure in the integration of technology in the classroom. He has more than six years of working experience in this field. He is qualified as a subject matter expert because he has vast experience in evaluating teaching materials for foundation classrooms especially the English 1 module.

Subject matter expert 3 (SME 3) is attached to the Center for Foundation Studies at a private higher learning institution in the Klang Valley. She has a Bachelor's degree in TESL (Teaching English as a Second Language). She is a qualified subject matter expert and has been teaching the English Language to foundation students and diploma students for more than eight years. Her current forte includes technology integration in the classroom, especially on flip classroom teaching approaches. All three subject- matter experts are well versed in the content and have appropriate knowledge and expertise in evaluating English 1 foundation modules.

Evaluation of Design of the Interactive Presentation Module: In this section, the research question for this phase which involves the feedback obtained from the Subject Matter and Technology Expert in helping to develop the interactive presentation module will be discussed. Data collection for this round will be obtained from interview transcripts that were analysed for emerging themes for a further discussion.

Development of Interactive Presentation Module: According to Morrison (2010), the development stage starts the creation and testing of the methodology being used in the project. In this stage, designers make use of the data collected from the two previous stages and use this information to create a program that will relay what needs to be taught to participants. If the two previous stages required planning and brainstorming, the Development stage is all about putting it into action. This phase includes three tasks namely drafting, production and evaluation. Development thus involves creating and testing of learning outcomes. This step is intended to draw a conclusion on how the instructional activities help achieve the objectives. The entire process will take about five weeks as only five weeks are allocated in the course outline for speaking related activities. The first week will be the introduction of the oral presentation skills which will be done in the classroom by the lecturer.

Next, it will be followed by two weeks of training with the Interactive White Board, during the fourth week, students will be conducting trial runs by practicing their presentation materials with the Interactive White Board and on the fifth week, students will present their final product in front of their lecturers and other students .This module not only includes teacher-led delivery but has also incorporated group-based and learner-

centered activities, especially when conducting the activities during the tutorials and for the final project.

For the final presentation, all students will be required to form groups of five and they will be required to use the Interactive White Board as their presentation tool. This step stipulates the use of specified strategies in developing instructional materials. The aim of the second phase is to design a module for an interactive presentation module using the Interactive White Board in a foundation architecture classroom on a topic related to profession and drawings.

The information from the needs analysis phase is gathered and later the feedback from the subject matter and technology expert must be obtained during the formative evaluation process to support in the interactive module development process.   The research question for this phase focuses on the second and third phase of ADDIE's model which involves design and development process of the module according to the themes obtained from the needs analysis phase and expert's opinion.

Furthermore, this phase is to determine and identify relevant processes or criteria needed to be incorporated into the design of the module integrating the Interactive White Board as a presentation tool based on the expert's opinion. Later, the expert's opinions on the initial phase of the development of this module were explored further

The data was collected based on written comments from the experts based on the interviews. The interview transcripts will be analysed and emerging themes pertaining to designing of the module will be discussed.

Data Collection and Analysis: The design documents that will be analysed are syllabus, lesson plans, learning activities for the interactive presentation module which will be assessed by a team of experts. After the experts have reviewed the design

documents, the researcher will go through the feedback and suggestions given by the experts where an interview session will be organized to gather information with regards to the design documents. Then, the researcher had gathered data from the interview transcript that have been given due consideration for the development process of the interactive presentation module. The summary of the data collection was shown in Figure 3.5.

```
┌─────────────────┐   ┌──────────────────┐   ┌──────────────────┐
│ Design of module │──▶│ Formative evaluation│──▶│ Improve on design of│
│                 │   │   by experts      │   │     module        │
└─────────────────┘   └──────────────────┘   └──────────────────┘

        ┌───────────────────────────────────────┐
        │   Experts go through teaching materials │
        └───────────────────────────────────────┘
                           │
                           ▼
   ┌───────────────────────────────────────────────────────┐
   │ Interview Protocol prepared based on comments from experts │
   └───────────────────────────────────────────────────────┘
                           │
                           ▼
            ┌───────────────────────────────┐
            │      Analysis of transcript     │
            └───────────────────────────────┘
                           │
                           ▼
           ┌─────────────────────────────────┐
           │ Identify emerging themes on design │
           └─────────────────────────────────┘
                           │
                           ▼
┌───────────────────────────────────────────────────────────────────────┐
│ Final design of interactive presentation module with Interactive White Board │
└───────────────────────────────────────────────────────────────────────┘
```
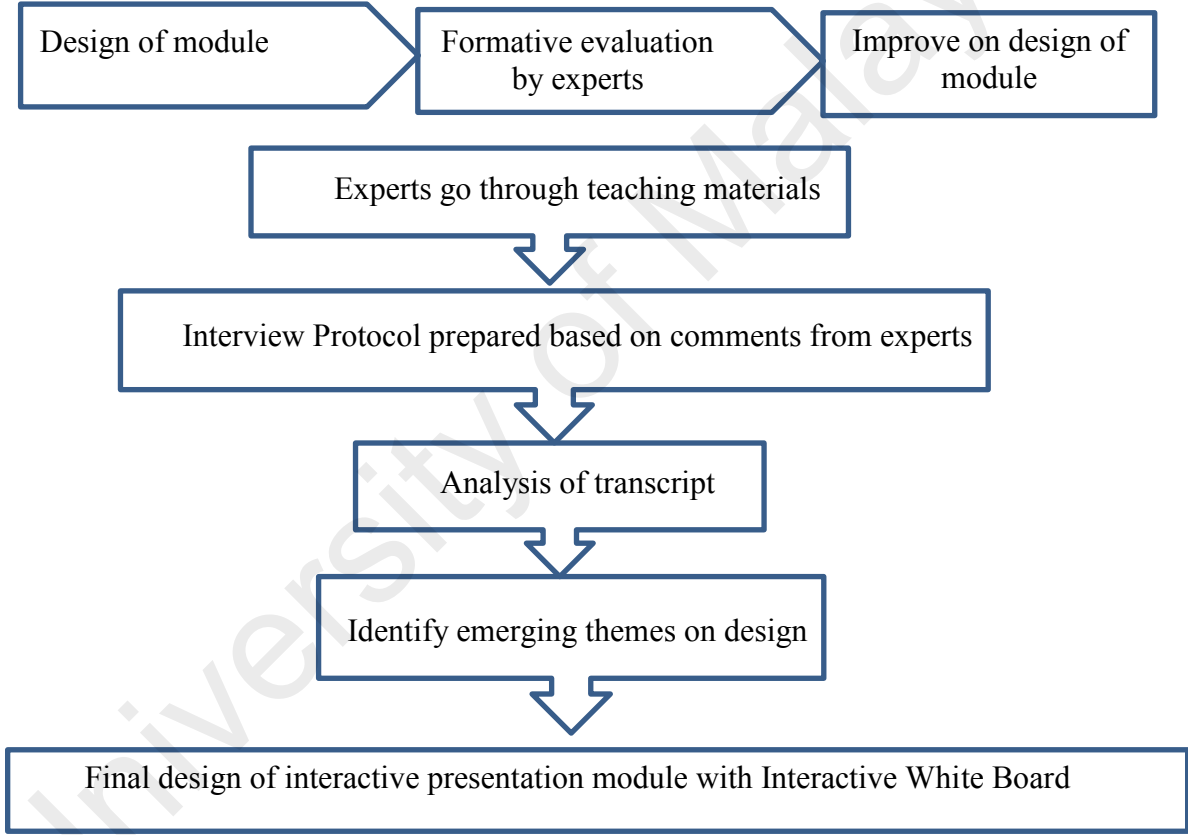
Figure 3.5: *Data collection process and development in the design phase*

Phase 3: Implementation and Evaluation

Implementation: The implementation stage reflects the continuous modification of the program to ensure that efficiency and positive outcomes are achieved. As mentioned by Morrison (2010), Instructional Designers aim to restructure, update or edit the course in order for it to be delivered effectively. Much of the "actual" work is done here as IDs and students work hand in hand to train on new tools and make sure the design is continuously being evaluated for further improvement. Since this stage gains much feedback both from the expert team and participants alike, much can be learned and addressed.

Design evaluation is done in the implementation phase. Designers play a very active role in this stage which is very crucial for the success of the project. Developers should consistently analyze, redesign and enhance the product to ensure effective product delivery. Thorough monitoring will be needed. Furthermore, a proper evaluation of the activity or module is necessary together with the timely revisions conducted in this phase. When instructors and learners actively contribute in the implementation, then instantaneous modifications can be made to the project thus making the program more effective and successful.

Implementation Procedure: The sixth stage in Gagne's instructional event is to bring forth the students' ability to perform. Students are tested through their ability to use the interactive board to conduct the interactive presentation. This is done to gauge student's ability to come up with an interactive material for the presentation. The seventh and eighth stages are to further assess students' performance respectively. Immediate feedbacks will be given to the students after their trial round practice during their tutorial slots before their final presentation day. Students then proceed to edit and practice their

presentation materials in their respective groups before the final presentation and submission day. They meet as groups to conduct two trials before to complete the activities using the Interactive Whiteboard. It is also beneficial for greater participation of students as it engages them actively in the learning process.

The ninth stage in Gagne's instructional events is to improve concentration and put across the knowledge that is acquired. In this stage, the students will be required to present their final presentation in front of their classmates and lecturers. To do this group based activity, the learners will be required to appropriately explore the newly acquired knowledge namely integrating usage of the Interactive White Board and oral presentation skills for the final presentation.

During the first five weeks upon the commencement of the semester, the students will be introduced to effective presentation skills. The one foundation cohort of students will be required to use the Interactive Whiteboard as part of their presentation while the other foundation cohort will be asked to conduct a presentation using Power Point slides. In addition, various presentations related materials will be given to the students to enhance their presentation skills during the five week period.

On the fifth week, all students will be required to come up with an oral presentation. The control group will be required to use the power point slides for their presentation and the experimental group will be required to use the Interactive White Board as a presentation tool. This group (experimental) of students will be given two rounds of training on the usage of the Interactive White Board as a presentation tool for their final presentation which is scheduled on the fifth week of the semester as stated in the course outline. During the five weeks, all participants will be informed of the learning outcomes, expected behavior and other necessities when carrying out the module.

Furthermore, all participants from the treatment group will be encouraged and guided by the researcher to produce an interactive presentation module using the Interactive White Board. All interactive presentations conducted at Week 5 will be evaluated based on the rubrics of an oral presentation.

Evaluation: The last stage of the ADDIE method is Evaluation. According to Danks (2011) at this last phase is where the project is being subjected to careful final testing. This phase is divided into two parts namely Formative and Summative. The initial evaluation actually happens during the development stage. This Formative phase happens when students and the expert team are conducting the study during the design and development phase while the Summative phase occurs at the end of the program which is at the evaluation stage.

The evaluation phase is mainly done to decide if aims have been met and to identify if alternative measures may be needed to further achieve the intended target. The process of evaluating and revising was done simultaneously during development and implementation process. The findings from the interviews by the Information Design experts and the Subject Matter Experts can further help in improving the module. The interview data that will be gathered from the Technical Expert will be based on Appendix G – Experts Evaluation of the module and the interview data that will be gathered from the Subject Matter Expert will be based on Appendix J – Instructor's Evaluation of the module. This step allows improvisation to the instructional materials. The feedback received will be given due consideration, and changes will be made accordingly.

On the other hand, at this stage the focus is on the summative evaluation where an interactive presentation using the Interactive White Board will be executed by a group of foundation students. After executing this module, all students from both the control and

treatment group will be required to fill up a survey form on their perception of using the Interactive White Board and 10 students will be asked to volunteer to be interviewed.

In Malaysia, little attention has been given to designing interactive modules, especially using the Interactive White Board to conduct a visual presentation among foundation students (Perinpasingam, Lee, Cheah, Lee & Arumugam, 2014).Therefore, it is vital to design an appropriate module to be used in a foundation classroom in a higher learning environment in Malaysia. Theoretical Framework and Methodology for an Interactive White Board were created to be used in a foundation classroom were based on the ADDIE model. This design model analyses the subject, the characteristics of the learners and the learning objectives.

Sample of study: The participants for the final phase which is the evaluation stage will be selected based on purposive sampling of students from the Foundation in Built Environment programme at a private higher learning institution in the Klang Valley. All 145 students from two separate intakes will be selected to participate in this investigation. Most of these participants are high school leavers or have completed SPM. The age group of the participants is aged between 18 and 19.

These students have enrolled in a foundation programme known as Foundation in Natural Built Environment at a private higher learning institution in Malaysia. This study involves semester one students. For this study, English 1 module which is a compulsory module for all semester one foundation students will be selected. Before the implementation process, all participants will be briefed about the use of the interactive module and the intended outcomes. In addition to that, all participants will be required to complete the consent form in order to take part in this study. Finally, all instructions and prerequisites will be given and explained to the students.

Evaluation Procedure: In this phase evaluation of the module will be done. The purpose of the evaluation is to decide on the participant's point of view about developing an interactive presentation module using Interactive White Board as well as the challenges faced by these participants. The data collection is divided into two phases namely before the execution of the final presentation and after the execution of the final presentation.

There will be two groups of students for this study. One group will be exposed to instruction without IWB use, and another group will be exposed to instruction with IWB use. Since, these are semester one foundation students, the same presentation question will be given to these two groups. Both of these groups will be working on this study for a period of five weeks and their presentation related activities and gathered responses will be used for the module's development process. After the students have completed their respective final presentation, data will be collected from a survey and interviews. Initially, a survey will be conducted by using a quasi-experimental methodology.

Two different questionnaires will be administered to the two different groups. (Refer to Appendix D and E). The groups of students consist of the group that will use the Interactive White Board for their presentation which is the independent variable in this investigation. Alternatively, the dependent variable, are students who have been given the similar presentation task but would not be using the Interactive White Board for their presentation. Subjects in the research classes had no prior exposure to the Interactive White Board, eliminating any pre-conditioning to the independent variable.

No names were used on any of the data collection instruments. All surveys completed by the subjects did not contain any student names. During the evaluation process, after conducting the survey, an interview was conducted with 10 students who

will be asked to volunteer from the experimental group to gauge on their opinion on the

presentation module. (Refer to Appendix K). Later the interview will then be transcribed.

The summary of the data collection process for Phase 3 is shown in Figure 3.6.

Implementation of module → Evaluation of module → Data collection methods are through survey and interview

Selection of participants
↓
Briefing students on research plan and purpose.
Students' consent was obtained and surveys on needs analysis and perception of the module were carried out.
↓
Introduction to speaking skills. Followed by lecture, tutorials and training using Interactive White Board for presentation Board
↓
Final Presentation
↓
Survey on perception of the module.
Two groups will be involved in the survey.
One group that uses IWB and another that uses PowerPoint Slides.
↓
Focus group interview with selected groups

Figure 3.6: *Procedure for data collection in Phase 3: Implementation and evaluation.*

Analysis of Data: The data collected from the surveys and interviews will be

coded and analyzed in order to provide answers to the research questions. The codes that

were identified after interviewing the Programme Director and lecturer for the Needs

Analysis phase were usage of Interactive White Board, time allocation, reason's for implementation, types of support needed, current problems, benefits gained and areas that need to be developed. Next, the codes that were derived after interviewing the technical experts and the subject matter experts for the design and development phase were based on Kristof and Satron's interactive design process namely Information Design, Interactive Design and Presentation Design. Finally, for the implementation and evaluation phase, the codes were derived from interviewing 10 students from the intervention group on the Interactive presentation module using Interactive White Board as a presentation tool. The codes were objectives and learning outcomes, content and learning materials, activities, navigation and final presentation assignment. Furthermore, another code on learning theories was also derived from interviewing experts and students.

Reliability and validity: Triangulation means using several methods to collect data on the similar topic. This is a way of assuring the validity of research through the use of a variety of methods to collect data on the same topic, which involves different types of samples as well as methods of data collection. However, the purpose of triangulation is not necessarily to cross-validate data but rather to capture different dimensions of the same phenomenon. For this research, reliability results are as follows.

Reliability Test: For the need analysis questionnaire, Part 2 and Part 3 questions were subjected to reliability test or internal consistency which was measured using Cronbach's alpha. Cronbach's alpha is the most common measure of internal consistency which will determine if the scale used in multiple Likert questions is reliable. In this study, a total of 30 respondents were requested to answer the need analysis questions as part of the pilot study. The data was subjected to reliability test using SPSS version 21.

It was found that, for part 2 which included questions related to Technology Usage, the Cronbach's alpha was 0.859, which indicates a good internal consistency. For part 3 which included questions related to Use of Technology in Learning, the Cronbach's alpha was 0.953, which indicates an excellent internal consistency. Hence, the questions can be used as part of the study to analyze the need for the Interactive whiteboard in teaching and learning.

Additionally, for the summative evaluation, the questionnaire on the perception of technology usage in the classroom for teaching and learning was subjected to the reliability test as well. The analysis was done separately for usage of IWB (Appendix D) and non-usage of IWB (Appendix E) with a total of 30 respondents each. We found that, for IWB usage, the Cronbach's alpha was 0.860 whereas for non-usage of IWB, the Cronbach's alpha was 0.715. Hence, the questions can be used as part of the study to analyze the need for the Interactive whiteboard in teaching and learning.

Study Procedure: The subjects were the students assigned to classes of the participating researcher, ages 18-21, studying in semester one of foundation programme in a private higher learning institution in Malaysia. The students were segregated into two separate groups. One group had used PowerPoint slides, which is the control variable while the other group had used the IWB to conduct a visual presentation. The student's permission was obtained before the commencement of this research.

The study was conducted over a five week period during the first semester of the foundation programme of the school year. Prior to the commencement of their presentation, a needs analysis survey was conducted to obtain their perception on using the Interactive White Board and Power Point slides. In addition to that, the experimental and control group completed a survey regarding their respective use of technology

namely PowerPoint slides and Interactive White Board on their perceived levels of enjoyment and engagement.

Data Analysis: Data were summarized using descriptive statistics which included frequencies, percentages, mean, standard deviation (SD), median and inter-quartile range (IQR), organized into tables. To test the hypotheses, independent sample T-tests was conducted to test the mean difference between pre-test scores of PPT and IWB group as well as post-test scores of both the groups. To compare the significant difference in the mean score before and after the intervention, paired sample t-test was performed.

In addition, domains for technology use in teaching and learning, presentations and the activities and assignment were estimated from the exploratory factor analysis (PC-EFA). The factors were extracted using principle component (PC) method and were rotated with Varimax rotation. As a rule of thumb, the Keiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) is 0.6 or greater and Barlett's Test of Sphericity is statistically significant ($p < 0.05$) to verify that the data set is suitable for factor analysis (Dipnall et al., 2014).

Marchini et al. (2005) mentioned that the choice of the number of factors was first based on the Kaiser criterion, the most frequently used criterion in factor analysis (Eigenvalue > 1.0). Often, there will be too many factors extracted with eigenvalues above 1. Thus factor determination was also based on the eigenvalue plot (scree plot), which plots the total variance associated with each factor (Bravi et al., 2014). Factors above the elbow of scree plot were extracted and retained as the domain. Each item belonged to the factor that loads the highest loading. In this analysis, a cut-off point of 0.40 was set to expect item with at least moderate correlation (Dipnall et al., 2014). Further to this, to analyse the real effectiveness of the intervention, the IWB, the post-

test scores of PPT and IWB group was tested using a one-way ANCOVA, with the respective pre-test score as the covariates. Moreover. In order to evaluate the differences in the mean score of students' perception between time (pre-test and post-test) and between two groups (IWB vs. PPT), split-time ANOVA (SPANOVA) was applied

Summary

The research utilized a quantitative and qualitative approach as the primary data source. The former was a quasi-experimental design and the latter involved semi–structured interviews. The benefits of triangulation include "increasing confidence in research data, creating innovative ways of understanding a phenomenon, revealing unique findings, challenging or integrating theories, and providing a clearer understanding of the problem" (Thurmond, 2001, p. 254). Thus, using interviews as well as questionnaires added a depth to the results that would not have been possible using a single-strategy study, thereby increasing the validity and utility of the findings.

All students assigned to classes of the participating researcher will be the subjects of the study. The students in this experiment are semester one foundation students, in a private higher learning institution in Malaysia. These students, 71 (Independent) and 74 (Dependent) in total for two respective groups, ages 18-21, will be participating in this research. This research involves two separate groups. One group used PowerPoint slides, which is the dependent variable followed by another group of students that used IWB to conduct a visual presentation, which is the independent variable in this study. The student's permission will be obtained before the commencement of this research. The study will be conducted over a five-week period during the first semester of the foundation programme of the school year.

Prior to the commencement of their presentation, a needs analysis survey will be conducted to obtain their perception on using the Interactive White Board and Power Point slides. In addition to that, the independent group and the dependent group of students will be required to complete a survey regarding their respective use of technology namely PowerPoint slides and Interactive White Board and their perceived levels of enjoyment and engagement. Data will be summarized using descriptive statistics, organized into tables. Data tables showing percentage data for each class will be tabulated and arranged into charts. In addition, EFA was conducted for multivariate analyses.

Furthermore, the tests of significance that will be used for data analysis will be paired sample and independent sample T-tests. Subgroups on the different usages of technology such as the Interactive White Board and Power Point slides for the presentation were further analysed using ANCOVA. Finally, to evaluate the differences in the mean score of students' perception between test and two groups. split-time ANOVA (SPANOVA) was conducted. In conclusion, the benefits of triangulation include "increasing confidence in research data, creating innovative ways of understanding a phenomenon, revealing unique findings, challenging or integrating theories, and providing a clearer understanding of the problem" (Thurmond, 2001, p. 254). Thus, using interviews as well as questionnaires added a depth to the results that would not have been possible using a single-strategy study, thereby increasing the validity and utility of the findings.

Table 3.2

Summary of Data Collection

Research Questions	Method	Participants
Phase 1 Needs Analysis		
1. What is the situation of using technology among students for the context of the study in the following area: a.the level of technology (ICT) skills? b.Student's access on usage of Interactive White Board?	**Survey**	**71 students who will be using Interactive White Board and 74 students who will be using Power Point slides for their presentation.**
2. What are the current needs among the teachers during a presentation session in a foundation classroom? 3. What are the problems faced in the current implementation among the teachers during a presentation session in a foundation classroom?	**Semi structured interview**	**Programme Director of theFoundation Programme and another foundation lecturer**

Research Questions	Method	Participants
Phase 2 and 3: Design and Development Phase		
4. What are the methods or criterion entailed in the designing phase of the Interactive Whiteboard module?	**Semi structured interview**	**Two instructional technologist**
a. What are the processes involved in designing the module using the interactive Whiteboard?	**Semi structured interview**	**Three lecturers (subject matter experts)**
b. What are the opinions of the experts with regards to the design of this module using the Interactive Whiteboard?		
C. Implementation and evaluation phase 5. Is there a difference in perception among students in using PowerPoint slides and Interactive White Board in the following area? a. Gender b. Ethnicity c. Proficiency level for speaking and writing	**Survey** **Quasi experiment.** **Two groups** **Independent group with usage of IWB and dependent with usage of Powerpoint slides**	**71 students who had used the Interactive White Board and 74 students who had used Power Point slides for their presentation.**

Research Questions	Method	Participants
6. Does the usage of Interactive White Board improve the overall perception of presentation skills in comparison to the conventional PowerPoint presentation method? 7. Is there a difference in performance among students in using PowerPoint slides and Interactive White Board?	Analysis of final presentation grades between two groups.	
8. What are the opinions of the students using this module with the interactive whiteboard in a language classroom?	Semi structured interview. Focus group interview	10 students who had conducted their presentation using the Interactive White Board.

CHAPTER 4 RESEARCH FINDINGS

Findings of Phase 1: The Analysis

In this chapter, the results of the *Need Analysis* on technology usage among students are described. The aspects covered are the student's perception on their skills in using the computer, ownership and access to technology equipment, frequency of technology usage and finally their perception on the use of technology such as PowerPoint and the Interactive Whiteboard in learning. The data which was collected through a survey was analyzed using descriptive statistics. The findings regarding the situation of the usage of technology of a group of students in the context of the study was arranged according to the research questions:

1. What is the situation of using technology among students for the context of the study in the following areas:

    a. The level of technology (ICT) skills?

    b. Student's access on usage of the Interactive White Board?

    b. Frequency of use of the Interactive White Board as a presentation tool.

Perception of Skills in Computer Usage: Part 1 of the needs analysis questionnaire enquired about the courses related to computers attended by students for training purposes and their level of competency in using computers. As illustrated in Figure 4.1, more than three-quarters of the students (87.6%) have attended computer related courses to improve their skills. However, Figure 4.2 shows that only one quarter (25.5%) are very skilled in computer use. Yet, two-thirds of the students are skilled (60.7%) which collectively make the students skilled in computer use as 86.2%. None rated themselves as low skilled.

Computer Course
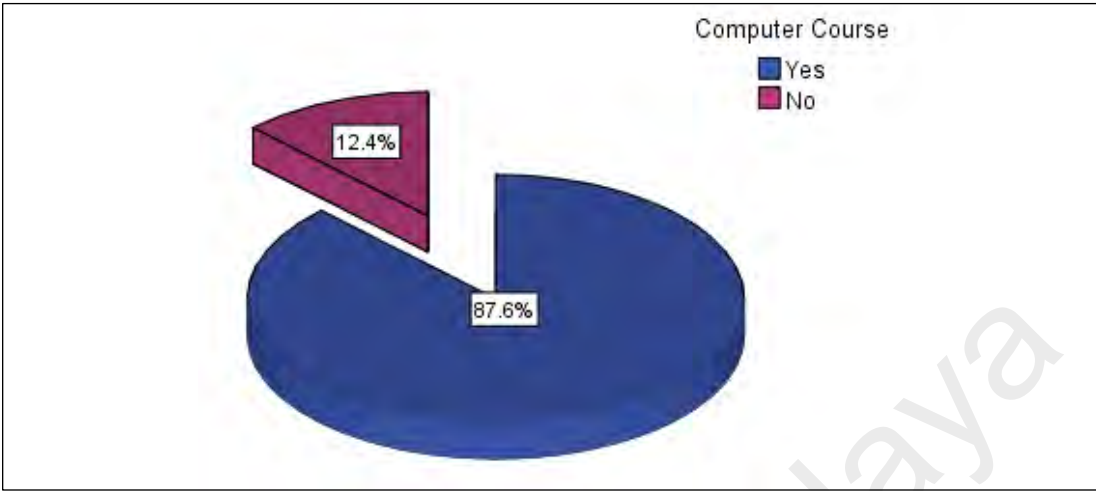
Figure 4.1 *Percentages of Students that Attended the Computer Course*

Computer Skill
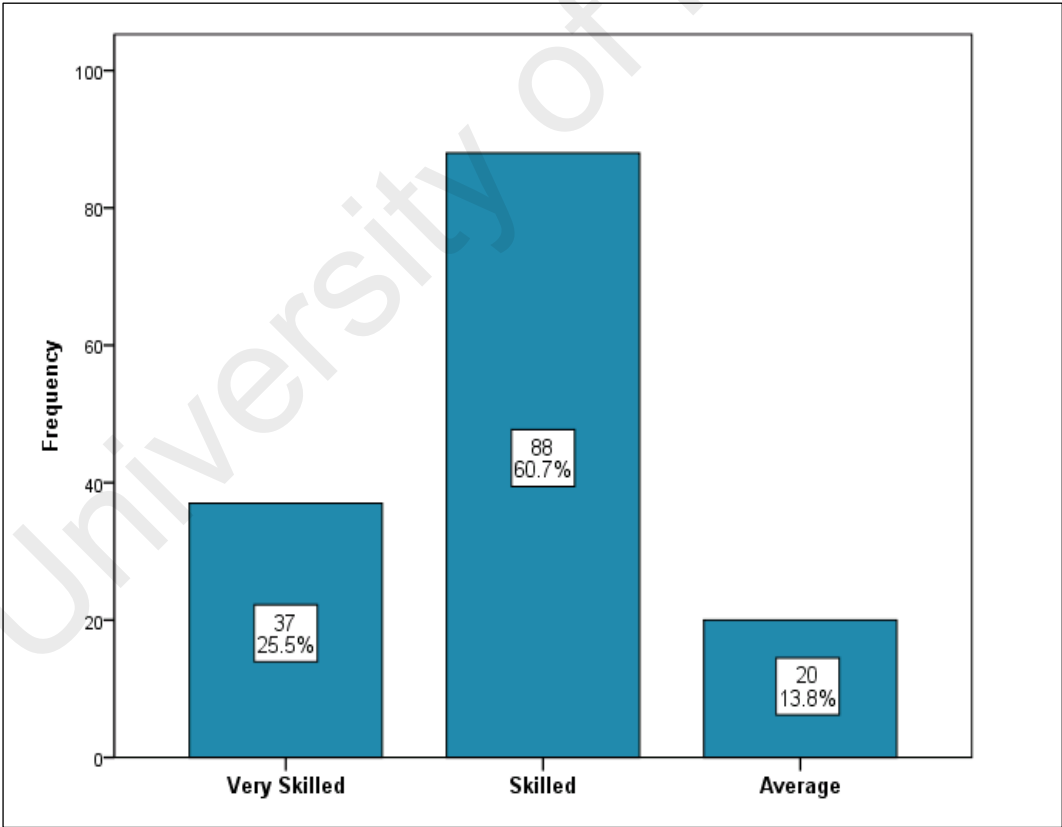
Figure 4.2 *Students Computer Skill*

Technology Equipment Accessed: Part 1 of the needs analysis questionnaire also enquired about the ownership and assess of the technology equipment from computers to audio players. The results are given in Table 4.1. Overall, almost all of the students owned a personal computer or laptop (98.6%) with access to the internet (96.6%). Close to two-thirds of them also owned a portable DVD player or MP4 (60.7%). At the lower end, only 29.0% owned digital audio players, MP3 or an iPod while 15.9% owned VCD or DVD players.

Table 4.1

Ownership and Assess to Technology Equipment (N=145)

Technology Equipment	Ownership, N (%)	
	Yes	No
Personal Computer / Laptop	143 (98.6)	2 (1.4)
Computer with Internet Access	140 (96.6)	5 (3.4)
VCD /DVD player	23 (15.9)	122 (84.1)
Digital audio player/ MP3 / iPod	42 (29.0)	103 (71.0)
Portable DVD player / MP4	88 (60.7)	57 (39.3)

Frequency of Technology Use: Part 2 of the needs analysis questionnaire included student's response to questions related to 'Technology Usage'. This included (i) frequency of use of communication tools for learning such as basic computer concepts and operations as well as research and problem solving tools and (ii) frequency of use of commercial technology tools. The possible responses were *Almost never (1), One in two/three months (2), Once a month (3) and Once a week/more (4).* Table 4.2 and Table 4.3 show the responses for (i) and (ii) respectively.

Use of Technology in Basic Computer Operations and Concepts as well as Research and Problem Solving Tools: Based on Table 4.2, the maximum number of students, at least once a week, use printers to print documents (87.6%; mean ± SD = 3.8 ± 0.5) or write reports or other documents using word processing software (75.2%; mean ± SD = 3.6 ± 0.7). Close to half of the students also use PowerPoint presentation slides and scanners or digital cameras at least once a week. However, only about one-quarter of the students enter data in a spreadsheet in the same duration (24.1%; mean ± SD = 2.7 ± 1.0).

On the other hand, at least once a week, more than 80% of the students obtain information from web-based search engines such as Yahoo or Google (mean ± SD = 3.8 ± 0.5) and close to half use graphical software (55.2%), evaluate the validity of information obtained from the web (50.4%) and obtain information such as references using CD-ROM (46.2%).

Table 4.2

Analysis on Frequency of Use of Technology in Basic Computer Operations and Concepts and Research and Problem Solving Tools

Technology Use	Frequency, n (%)				Mean ± SD
	1	2	3	4	
Basic computer concepts and operations					
Word processing	3 (2.1)	11 (7.6)	22 (15.2)	109 (75.2)	3.6 ± 0.7
Power Point presentation	5 (3.4)	31 (21.4)	38 (26.2)	71 (49.0)	3.2 ± 0.9
Excel spreadsheet	17 (11.7)	39 (26.9)	54 (37.2)	35 (24.1)	2.7 ± 1.0
Scanner or digital cameras	18 (12.4)	22 (15.2)	36 (24.8)	69 (47.6)	3.1 ± 1.1
Printers	1 (0.7)	3 (2.1)	14 (9.7)	127 (87.6)	3.8 ± 0.5
Research and Problem Solving Tools					
References using CD-ROM	47 (32.4)	15 (10.3)	16 (11.0)	67 (46.2)	2.7 ± 1.3
Search engines	1 (0.7)	1 (0.7)	26 (17.9)	117 (80.7)	3.8 ± 0.5
Evaluating materials from internet	6 (4.1)	32 (22.1)	34 (23.4)	73 (50.4)	3.2 ± 0.9
Graphical software	19 (13.1)	19 (13.1)	27 (18.6)	80 (55.2)	3.2 ± 1.1

Use of Communication Tools for Learning: Based on Table 4.3, more than half of the students send e-mails (66.9%; mean ± SD = 3.4 ± 1.0) or receive e-mails (57.2%; mean ± SD = 3.2 ± 1.1) at least once a week. On average, 65.6% of the students use e-mails at least once a week. For online discussion, usage of tools such as Facebook message or chat, WhatsApp, Yahoo messenger, bulletin board or blogging was assessed.

The maximum number of students share media files such as pictures, music or audio using the online tools at least once a week (85.5%; mean ± SD = 3.8 ± 0.6) followed by 80.0% share information with peers or experts (mean ± SD = 3.5 ± 0.7). Close to 70% of the students send and receive information from peers or experts (mean ± SD = 3.6 ± 0.6) as well as discuss and exchange data with peers or experts (mean ± SD = 3.6 ± 0.8). On average, 83.4% of the students use online discussion tools at least once a week. Next, almost half of the students develop presentations (PowerPoint slides, newsletter or webpage) to communicate information learned in school (mean ± SD = 3.2 ± 1.1) and only 11.0% students have almost never done this.

In contrast to the findings pertaining to e-mails, online discussion tools and PowerPoint presentations, the technology that has the least number of students involved is the usage of the Interactive White Board. On average, only 11.0% of the students have experienced developing presentations (13.1%; mean ± SD = 2.0 ± 1.1), share or discuss about an information (11.0%; mean ± SD = 2.0 ± 1.0), send information and make changes (12.4%; mean ± SD = 1.9 ± 1.1) or using the Interactive White Board to access the internet to search for information or read e-mails (13.8%; mean ± SD = 2.0 ± 1.1). These findings suggest that usage of the Interactive White Board is an idea worth venturing into the teaching and learning process.

Table 4.3

Analysis of Frequency of Use of Technology Communication Tools

Skill with Technology Communication Tools	Level of Usage, n (%)				Mean ± SD
	1	2	3	4	
E-mails					
E-mail Sending	12 (8.3)	18 (12.4)	18 (12.4)	97 (66.9)	3.4 ± 1.0
E-mail Receiving	19 (13.1)	19 (13.1)	24 (16.6)	83 (57.2)	3.2 ± 1.1
Average	10 (6.9)	21 (14.4)	19 (13.1)	95 (65.6)	3.3 ± 1.0
Online Discussion Tools					
Send and Receive Information	0 (0)	13 (9.0)	31 (21.4)	101 (69.7)	3.6 ± 0.6
Sharing Information	4 (2.8)	10 (6.9)	44 (30.3)	87 (80.0)	3.5 ± 0.7
Discuss and Exchange Information	6 (4.1)	9 (6.2)	28 (19.3)	102 (70.4)	3.6 ± 0.8
Sharing Media Files	2 (1.4)	5 (3.4)	14 (9.7)	124 (85.5)	3.8 ± 0.6
Average	0 (0)	8 (5.5)	16 (11.1)	121 (83.4)	3.6 ± 0.5
Develop presentations (power point slides, newsletter or webpages)	17 (11.7)	21 (14.5)	30 (20.7)	77 (53.1)	3.2 ± 1.1
Interactive White Board					
Develop presentations	63 (43.3)	41 (28.3)	22 (15.2)	19 (13.1)	2.0 ± 1.1
Share information or discuss	62 (42.8)	37 (25.5)	30 (20.7)	16 (11.0)	2.0 ± 1.0
Send information and make changes	71 (49.0)	35 (24.1)	21 (14.5)	18 (12.4)	1.9 ± 1.1
Access internet	68 (46.9)	36 (24.8)	21 (14.5)	20 (13.8)	2.0 ± 1.1
Average	58 (40.0)	47 (32.4)	24 (16.6)	16 (11.0)	2.0 ± 1.0
Develop presentations (power point slides, newsletter or webpages)	17 (11.7)	21 (14.5)	30 (20.7)	77 (53.1)	3.2 ± 1.1
Interactive White Board					
Develop presentations	63 (43.3)	41 (28.3)	22 (15.2)	19 (13.1)	2.0 ± 1.1
Share information or discuss	62 (42.8)	37 (25.5)	30 (20.7)	16 (11.0)	2.0 ± 1.0
Send information and make changes	71 (49.0)	35 (24.1)	21 (14.5)	18 (12.4)	1.9 ± 1.1
Access internet	68 (46.9)	36 (24.8)	21 (14.5)	20 (13.8)	2.0 ± 1.1
Average	58 (40.0)	47 (32.4)	24 (16.6)	16 (11.0)	2.0 ± 1.0

Perceptions on the Use of Technology: Part 3 of the need analysis questionnaire included student's response to questions related to their perception on the 'Use of Technology in Learning' which included the use of PowerPoint slides and the Interactive White Board. The possible responses were *Don't know (1), Not True (2), True (3) and Very true (4).* Table 4.4 and Table 4.5 shows the responses for PowerPoint and IWB use respectively.

Based on Table 4.4, almost three quarters (77.2%) students disagree that PowerPoint cannot assist in doing presentations with a mean of 2.3 (SD = 0.7). This reveals that using PowerPoint presentation slides do assist in doing presentations. Except for the first statement, close to 90% of the students perceived that all the other statements enquired are true about them, with almost half saying that it is very true. The highest mean was obtained for perception on confidence in learning to use PowerPoint (mean ± SD = 3.4 ± 0.7), equal chances for students in using PowerPoint for learning activities (mean ± SD = 3.4 ± 0.8) and usefulness of knowing how to the use PowerPoint (mean ± SD = 3.4 ± 0.6). Almost half of the students said it is very true that they are waiting for the time when they can use PowerPoint slides for presentation at university (46.9%; mean ± SD = 3.2 ± 0.9).

However, 44.2% said it is very true that learning to use PowerPoint slides is like learning any other skill, the more one practices, the more efficient one becomes (mean ± SD = 3.3 ± 0.8). In addition, 44.1% of the students perceived it is very true that presentation with PowerPoint slides assists in learning with others and in learning many things; both with a mean of 3.3 (SD = 0.7). Overall, students perceived that it is beneficial to incorporate PowerPoint slides in teaching and learning practices in particular for their verbal presentations.

Table 4.4

Student's Beliefs on the Use of Power Point (PP) Slides in the Classroom

Statements on Beliefs	Frequency, n (%)				Mean ± SD
	1	2	3	4	
I do not think the PP can assist in doing presentation.	5 (3.4)	112(77.2)	8 (5.5)	20 (13.8)	2.3 ± 0.7
I am confident that I can learn to use PP slides for presentation.	5 (3.4)	7 (4.8)	56 (38.6)	77 (53.1)	3.4 ± 0.7
All students should be given a chance to use PP slides for learning activities.	6 (4.1)	12 (8.3)	48 (33.1)	79 (54.5)	3.4 ± 0.8
Knowing how to use PP is a useful skill.	1 (0.7)	6 (4.1)	70 (48.3)	68 (46.9)	3.4 ± 0.6
PP slides assist me in my presentation skills.	4 (2.8)	4 (2.8)	76 (52.4)	61 (42.0)	3.3 ± 0.7
Presentation with PP slides assists me in learning with others.	4 (2.8)	7 (4.8)	70 (48.3)	64 (44.1)	3.3 ± 0.7
Using PP slides can improve thinking skills.	6 (4.1)	16 (11.0)	64 (44.1)	59 (40.7)	3.2 ± 0.8
PP slides assist in improving learning.	4 (2.8)	9 (6.2)	74 (51.0)	58 (40.0)	3.3 ± 0.7
I can learn many things using PP slides.	4 (2.8)	10 (6.9)	67 (46.2)	64 (44.1)	3.3 ± 0.7
I feel important when others consult me about PP.	8 (5.5)	23 (15.9)	55 (37.9)	59 (40.7)	3.1 ± 0.9
I feel happy doing many activities using PP slides.	8 (5.5)	18 (12.4)	73 (50.3)	46 (31.7)	3.1 ± 0.8
I can perform better if I learn using the PP slides.	8 (5.5)	13 (9.0)	73 (50.3)	51 (35.2)	3.2 ± 0.8
I believe that using PP slides makes the lesson fun.	9 (6.2)	13 (9.0)	67 (46.2)	56 (38.6)	3.2 ± 0.8
Learning to use PP slides is like learning any other skill, the more one practices, the more efficient one becomes.	7 (4.8)	6 (4.1)	68 (46.9)	64 (44.2)	3.3 ± 0.8
I am waiting for the time when I can use PP slides for my presentation at university.	6 (4.1)	23 (15.9)	48 (33.1)	68 (46.9)	3.2 ± 0.9

Based on Table 4.5, about two-thirds of the students did not agree that IWB will not assist them in their presentation (65.5%) with a mean of 2.1 (SD = 0.7). The maximum number of students (46.2%) strongly agree (very true) that learning to use Interactive White Board is like learning any other skill, the more one practices, the more efficient one becomes (mean ± SD = 3.1 ± 1.1).

Following this, about 40.7% of the students believe that the more we use IWB, the lesson becomes more fun (mean ± SD = 3.0 ± 1.1) and 40.0% believe that equal chances should be given to all students to use IWB for learning activities (mean ± SD = 3.1 ± 1.0). In contrast, one-third of the students said it is very true that knowing how to

use IWB is a useful skill (mean ± SD = 3.0 ± 1.0). Only close to 5% of the students

perceived all the statements about benefits of using IWB in the classroom as not true.

Table 4.5

Student's Beliefs on the Use of Interactive White Board (IWB) in Classroom

Statements on Beliefs	Frequency, n (%)				Mean ± SD
	1	2	3	4	
I do not think IWB can assist in presentation.	25 (17.2)	95 (65.5)	15 (10.3)	10 (6.9)	2.1 ± 0.7
All students should be given a chance to use IWB for learning activities.	20 (13.8)	5 (3.4)	62 (42.8)	58 (40.0)	3.1 ± 1.0
Knowing how to use IWB is a useful skill.	23 (15.9)	6 (4.1)	67 (46.2)	49 (33.8)	3.0 ± 1.0
Receiving learning information through the IWB can assist in remembering facts.	30 (20.7)	9 (6.2)	69 (47.6)	37 (25.5)	2.8 ± 1.1
IWB can assist me in my presentation skills.	26 (17.9)	5 (3.4)	81 (55.9)	33 (22.8)	2.8 ± 1.0
Presentation with IWB is useful learning with others.	27 (18.6)	4 (2.8)	70 (48.3)	44 (30.3)	2.9 ± 1.0
Using IWB can improve thinking skills.	29 (20.0)	6 (4.1)	66 (45.5)	44 (30.3)	2.9 ± 1.1
Using IWB can assist in improving learning.	30 (20.7)	7 (4.8)	64 (44.1)	44 (30.3)	2.8 ± 1.1
I can learn a lot of things using the IWB.	28 (19.3)	3 (2.1)	68 (46.9)	46 (31.7)	2.9 ± 1.1
I am happy doing many activities using IWB.	30 (20.7)	5 (3.4)	64 (44.1)	46 (31.7)	2.9 ± 1.1
I can do better if I learn using the IWB.	28 (19.3)	7 (4.8)	63 (43.4)	47 (32.4)	2.9 ± 1.1
I believe the more we use IWB, the lesson becomes more fun.	29 (20.0)	5 (3.4)	52 (35.9)	59 (40.7)	3.0 ± 1.1
Learning to use IWB is like learning any other skill, the more one practices, the more efficient one becomes.	27 (18.6)	2 (1.4)	49 (33.8)	67 (46.2)	3.1 ± 1.1
I am waiting for the time when I can use IWB in my presentation at university.	33 (22.8)	10 (6.9)	65 (44.8)	37 (25.5)	2.7 ± 1.1

Another dimension of the needs analysis phase was gathered through expert interviews to

answer the following research questions.

1. What are the current needs among the teachers during a presentation session in a

   foundation classroom?

2. What are the problems faced in the current implementation among the teachers during

   a presentation session in a foundation classroom?

Interactive White Board

A semi-structured interview was conducted with the two architecture content experts who were the Programme Director (Expert 1,E.1) and a foundation lecturer (Expert 2,E.2) to obtain their opinions as content experts on the needs analysis area before deciding to introduce the usage of the Interactive White Board as a presentation tool among foundation students for the Foundation in Natural Built Environment programme. The analysis was based on the following sub-headings:

This section of the chapter will discuss the data from the findings obtained from the first part of the needs analysis interview which is on the usage of the Interactive White Board for the teaching and learning process. Based on the responses obtained from the interview, the areas such as time allocation on the usage of the Interactive White Board, reasons for implementation or introduction of the Interactive White Board as a teaching and learning tool, types of support needed and current problems faced by the students while conducting a presentation in class.

The usage of the Interactive White Board for Teaching and Learning process

Based on the opinions gathered from the Expert 1 and Expert 2, there are no specific allocation of time given to lecturers to use the interactive White Board in the Institution. The management of this Private Higher learning Institution has purchased three Interactive White Boards and these boards are made available in the Studio 3 rooms of the School of Architecture Building and Design. Lecturers are required to book a slot based on their tutorial slots in order to use the Interactive White Board to enhance their teaching and learning process.

The Interactive White Board is used mostly when there is a verbal presentation done during their tutorial slots. (SUF, E1, 52)

Our institution is well known for using electronic devices as teaching pedagogy to enhance students' engagement in class and making the lesson more effective. This interactive board is one of the best tools to be used. (AN, E2, 84-87)

Expert 2 further explained that the Interactive White Board was purchased to cater to certain needs of the school. This lecturer further added that this teaching innovation was first introduced by the researcher.

It was introduced by a lecturer in our team for an integrated assignment with 3 different modules. She came out with the idea of making the Interactive White Board as a medium of presenting the content of the assignment. (AN, E2, 74-78)

One of the purposes of purchasing the Interactive White Board by the institution was to overcome the shortage of space as there are limited available spaces for students to pin up or display their posters that are needed for their verbal presentations. These Architecture students will need to pin up their mounting boards prior to their actual presentation. In addition to that, students are able to make immediate amendments to their work using this Interactive White Board. Hence, the added advantage is that these students are able to save money because they are not required to reprint their work but present their work on a digital platform and after working on their final presentation and making necessary changes; they proceed to print a final hardcopy of their work. Therefore, Expert 1 strongly feels that the students will benefit by getting them to conduct their oral presentations using the Interactive White Board due to saving in space and printing related cost.

In addition to that, this Interactive White Board enables students to present their work in a digital format and make necessary changes prior to printing their final presentation on the mounting board. Hence, they are able to save on printing cost. (SUF, E1, 71-74)

The interactive board is used occasionally in the class due to limited resources that we are having especially limited space. (AN, E2, 71-72)

Problems and challenges faced by the teachers in using Interactive White Board

The second part of the interview focuses on the problems and challenges faced by the teachers in using the Interactive White Board. The areas that were focused include point of view problems and obstacles that the Programme Director and an instructor may encounter during the implementation of usage of the Interactive White Board, types of knowledge, skills support needed from the institution, guidance on integration of the Interactive White Board into a module taught in the foundation programme,

The initial problem faced by the lecturers when using the Interactive White Board was the phobia to use the board as a presentation tool which had led to lack of usage of the Interactive White Board. After getting the vendor to conduct training to the staff members, their confidence to use the Interactive White Board has increased and they were eager to explore the Interactive White Board further.

Based on the interview, both Expert 1 and Expert 2 who are content experts have stated that in order to implement the usage of the Interactive White Board, both the lecturers and students were required to attend training by the vendor.

Yes, the introduction to the IWB was conducted in the form of workshop by the vendor. (SUF, E1, 111-112)

Yes, the training received from the vendor. (AN, E2, 139)

Expert 1 had mentioned that they had an initial meeting with the vendor to explain the needs of the programme and purpose of integrating the use of the Interactive White Board in the foundation programme. The purpose of integrating the usage of the Interactive White Board is to be able to make student's presentation more interactive and more engaging.

Having this tool will allow them to be more engaging and elevate their communication skill which is essential as they enter the degree programme.
(SUF, E1, 72-74)

This tool is seen as one of an interesting method for presentation besides normal boring and dull PowerPoint slides being projected. Lecturers as well can give comment/feedback straight away to the specific content on the spot. It will increase students' understanding of what mistakes they have been made.
(AN, E2,91-95)

Therefore, the need to bring in the vendor of the Interactive White Board is to train the lecturers in order to allow them to focus on the usage of the Interactive White Board as a presentation tool in a foundation classroom. In addition to that, both Expert 1 and Expert 2 mentioned that the Interactive White Board was already purchased by the institution. Hence, the management was very supportive in encouraging the staff members to use this Interactive White Board in their classrooms.

In terms of the level of skills and knowledge, both Expert 1 and Expert 2 have mentioned that they have the basic skills of using the Interactive White Board as a presentation tool. Both of them agreed that there are sufficient facilities and resources that were made available by the institution to facilitate the usage of the Interactive White Board as there a three Interactive White Boards that were purchased by the institution that is made available in the Architecture studios for the usage of students to conduct their presentations. However, Expert 2 felt that the vendor could provide a more comprehensive manual to assist lecturers to understand the tools available on the Interactive White Board.

It's better to provide a separate training or workshops for instructors to learn about the skills and probably with more detailed manuals to assist. (AN, E2, 213-214)

According to Expert 1, there was no guide given to the lecturers in terms of developing a module using the Interactive White Board. However, the vendor provided training on the use of the Interactive White Board using three software programmes namely Multi- Touch Board Driver, Multi – Touch Board and Multi – Touch Lite Board. She has also mentioned that the lecturers needed more exposure in using the available tools in order to exploit and fully utilize tools available in the Interactive White Board. The current usage of the interactive White Board is usually three to four weeks during the semester; this board is used during student's tutorial slots for their presentation.

In addition to that, Expert 1 also agreed that the Interactive Whiteboard could be used as a tool to motivate and enhance the presentation skills and teaching and learning the process in a more interesting manner. Apart from that, it can be used as an alternative form of media for teaching and learning which is available in this school. Furthermore, it can promote and engage the learners as well as diversify the delivery of a lesson.

Problems and challenges faced by the foundation students in using the Interactive White Board: The second part of the interview focuses on the problems and challenges faced by the students in using the Interactive White Board. The focus areas that are related to this area of the data analysis include types of approach the institution plans to execute to improve presentation using the Interactive White Board among students.

Initially students felt that it was a difficult task but after going through a round of training with the vendor, most students were very excited about using this new tool to come up with an interactive presentation. All students were made to download the three types of software into their laptops. Then, students were given two weeks to prepare for their presentations.

According to Expert 1, in order to overcome their fear, all students were able to download the following software such as Multi- Touch Board Driver, Multi – Touch Board and Multi – Touch Lite Board into their laptops. During their tutorial slots, the studios were booked for three weeks in order for these students to practice their presentation materials using the Interactive White Board.

According to Expert 2 who mentioned that most students were more confident with most presentation tools by the second tutorial session and were eager to explore further other interactive tools that were available on the Interactive White Board. In addition to that, additional activities related to their presentations were given and conducted in the studio using the Interactive White Board.

> *As for students in my institution, I guess it does help them to become a more confident presenter and are well prepared for their presentations.* (AN, E2, 173-175)

Benefits gained from using The Interactive White Board as a presentation tool.

The third part of the needs analysis interview focuses on the types of benefits that can be obtained from using The Interactive White Board as a presentation tool. Following areas are looked at for the data analyses which include preparing students to be a confident presenter, improving their soft skills which will be relevant for the work environment for the future, time management and cost-related benefits and frequency of usage of the Interactive White Board. Expert 1 had mentioned that by introducing the Interactive White Board to these foundation students, it has been a beneficial and relevant approach to encourage students to come up with an interactive presentation.

All students made an attempt to practice for four weeks during their tutorial slots. This approach of practicing as a group prior to their final presentation which was scheduled in week 5 have made them to be more confident presenters using the

130

Interactive White Board. In addition to that, Expert 1 further adds that the introduction of the Interactive White Board among the foundation students has exposed these students to an extra presentation tool. These students are now one step above other students as they are more exposed to the current presentation trend using additional tools and software to make their presentation more interactive and engaging.

It will help to elevate confidence as one is not only talking but interacting with their presentation slides. (SUF, E1, 177-178)

According to Expert 2, these students are able to use various tools that are available on the Interactive White Board and will be able to attract the attention of the audience in a more convincing way.

The best part is we can do on the spot amendment and directly save it to our computer. It's really saving up our preparation time! (AN, E2, 186-187)

Moreover, according to Expert 1, this approach of presentation enables students to save time and cost due to its unique features of the Interactive White Board which allows students to write down the feedback obtained from their lecturers during their presentation on digital format and edit their work without incurring additional costs unlike if their presentation is done using the traditional approach where students print their final work on the mounting board.

Additionally, Expert 1 had mentioned that all students will gather in the studio for their four-week tutorial sessions to practice their presentation during that time.

For tutorial slots, the studio 3 was booked for five weeks to allow these students to practice their presentation materials using the Interactive White Board. (SUF, E1, 164-166)

Areas that need to be developed in the presentation module using the Interactive White Board: The following areas were analyzed that include types of expertise needed by the lecturers which are knowledge and skills, instructional materials and technological support. Based on the data analysis for this section, Expert 1 mentioned that all lecturers need help in incorporating the usage of the Interactive White Board in the classroom as the School of Architecture, Building and Design had only purchased these Interactive White Boards-in 2013.

All lecturers need to attend at least one training session on the usage of the Interactive White Board and familiarize with the tools available in the software in order to obtain the right kind of knowledge and skills before integrating the Interactive White Board into their modules.In addition to that, Expert 2, also share similar views that in order to familairise with the usage of the Interactive White Board, one needs to attend the training arranged by the vendor. Furthermore, Expert 1 explains that the materials that were prepared for these students are topics that are taken from their module outline. The only additional difference is getting these students to conduct a presentation using the Interactive White Boards to make the presentation more attractive and engaging.

According to both Expert 1 and 2, in terms of technological support, there is a need to have a board, a projector and a laptop with the software namely Multi- Touch Board Driver, Multi–Touch Board and Multi-Touch Lite Board. Besides, the WiFi service or Internet service must be good as the board enables the students to get connected to real time video to support their presentation needs or to look for images that are needed for their presentation.

> *Yes, there is. The WiFi facilities should be good to support online features like viewing of videos to support the Interactive Presentation.* (SUF,E1, 220-221)

As mentioned by both the experts, all students are given various tasks during the tutorial slots to familiarize themselves using the Interactive White Board. Remedial tasks can be administered to those students that require additional help and more advance presentation questions involving more sophisticated tools for advanced students.

Both the experts had stated that the type of assessment that was planned for the students must be fair and relevant to their programme since the final oral presentation is a group project. Therefore, all students are able to prepare their work without much difficulty as they can get assistance from their peers and lecturers. On the whole, both the experts agree that instructors need to think of appropriate pedagogical approaches to integrate their assignments with the Interactive White Board in order for students to fully utilize the potential of the Interactive White Board tools to enhance their presentation.

The two experts felt that students are generally excited as they see the Interactive White Board as a large I-pad screen which enables them to express their presentation ideas clearly and in a more convincing manner. The interactive tools are relevant and can make the presentation process more focused, engaging and convincing.

> *There is a variation in the presentation technique and they are more impressive and engaging.* (SUF, E1, 248)

> *Good exposure for students to improve their confidence level and teach them on how to make an interesting verbal presentation.* (AN, E2, 244-245)

Summary of the Needs Analysis Phase: During the needs analysis phase, a semi-structured interview with the Programme Director and a foundation lecturer took place. In addition to that, an analysis of survey of the point of view of the two groups of the students on the usage of the Interactive White Board and Power Point slides to come up with Interactive Presentations, which was the content of the module, was completed.

The results and suggestions in this phase were taken into consideration for the design and development phase. In the second phase, which is based on ADDIE's model will focus on the designing and development process of the module using the Interactive Whiteboard that was based on the findings from the needs assessment process. The three elements focused in the development of this module were information design, interaction design and presentation design as suggested by Kristof and Satran (1995).

Findings of Phase 2: The Design and Development

In Phase 1, the analysis phase, the usage and the opinion of the use of technology among a group of students and interviews of the content experts were explained. From the analysis, the condition of the group of students and the experts' opinion in the context of the study in the above mentioned area were identified. In Phase 2, a presentation module using the Interactive White Board as presentation tool was designed to take into account the usage of technology among the group of the students in the contexts of the study.

The designing process of the module using the Interactive Whiteboard was based on the findings from the needs assessment process. The three elements focused in development of this module were information design, interaction design and presentation design.

The research questions in Phase 2 are as follows:

1. What are the methods or criterion entailed in the designing phase of the Interactive Whiteboard module?

2. What are the processes involved in designing the module using the Interactive White Board?

Information Design: In designing the module using Interactive Whiteboard, the content was organized into an appropriate sequence based on the target audience and the

134

learning environment. The design of the contents and material were based on Gagne's Nine Instructional Events. Content materials were developed using software. It is simple and easy software to be used and most of the instructors had already acquired the knowledge and skills in operating this software. Its functions are similar to Microsoft Word. Hence this is the reason for selecting this software. Furthermore, it will also boost educators to develop their own interactive lesson.

The first page in this module is the main page. This page introduces the topic as well as the contents of the module. There are two options available for navigation. One can either touch the arrow buttons or touch the screen from left to right to go forward and right to leave to go back to the previous page.

Content materials were developed using the Microsoft Power Point and was projected on the Interactive White Board using various software namely Multi-Touch Board Diver, Multi-Touch Board and Multi Touch Lite-Board will be used during the students presentation using the Interactive White Board.
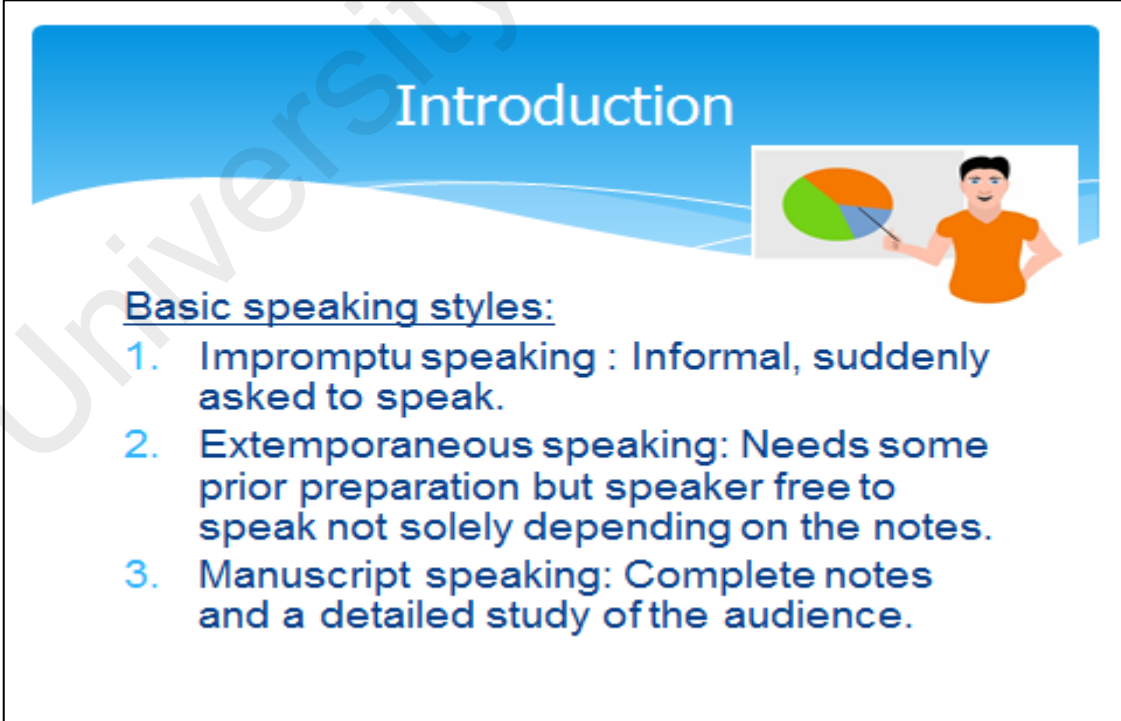
Figure 4.3: *Screen shot of the content page*

This page also acted as an introduction page. It contains information about the module. The content page will attract the student's attention and anticipate the upcoming scope of the topic. Therefore, the main page follows the first step in Gagne's Nine Instructional Events, which is to gain learners attention, where this page serves as the stimulus to arouse the learner's interest about the topic entitled "Oral Presentation Skills".

Figure 4.4: *Screen shot of the Objectives*

Figure 4.5: *Screen shot of the Learning Outcomes*

The target audience will be informed of the objective in order for them to know the scope of this module that they would be learning. Apart from that learning outcomes were given to inform the learners about the knowledge and the skills they were expected to gain after exploring the module and completing the given activities. This is the second step in Gagne's Instructional Events where it involves informing the learners the objectives and learning outcomes. This is done to create a level of expectation for the learners.

The third level in Gagne's instructional events involves the learners to recall of prior knowledge. Therefore the students were asked questions regarding their prior experiences related to presentation skills. Upon touching on the page sorter after going through all the slides, a learner can attempt any activities available in the module. The instructor and the learner can chose any sub topic that they intend to explore at any particular time.

Figure 4.6 *Example of notes taken from the module*
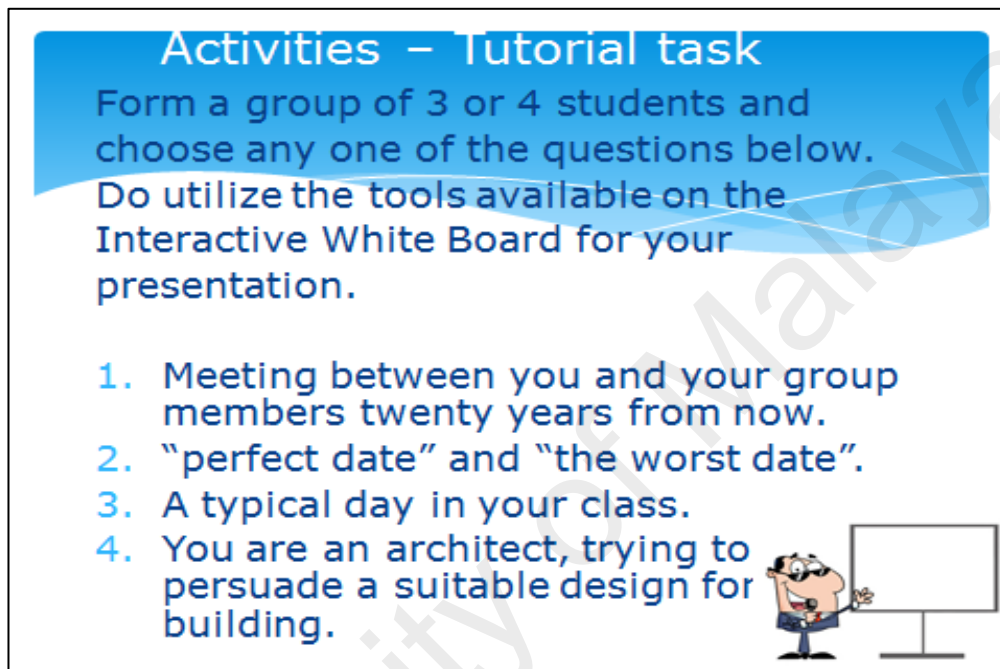
The forth level in Gagne's instructional events involves presenting the contents to the learners. Here the new contents were presented to the learners. The contents, which include the text, graphics and videos, appeal to different kinds of learning styles. These oral presentation topics were prepared to allow these students to practice their presentation prior to their final presentation. Most of the information was available in the slides. Hence, all students are required to explore the module in order to prepare the final presentation using the Interactive White Board.

Therefore, the students were motivated because they have the opportunity to explore possible tools that were available by navigating the Interactive Whiteboard to produce an interactive presentation. Furthermore, these activities would make learning fun, engaging and encourages active and collaborative learning approaches among students. The fifth step in Gagne's instructional events is to provide learning guidance where the teacher will help the students to further explore the topic and provide notes and sample video as a guide for the students.

Figure 4.7: *Screen shot on the video on usage of the Interactive White Board*

The sixth step in Gagne's instructional event is to elicit performance. Here the students will be given a variety of activities to enable the learners to comprehend the topic better. These activities enable students to have some practice prior to their actual presentation.

Figure 4.8: *Screen shot of a given activity.*

The seventh and the eight steps are to provide feedback and the latter to assess performance. Immediate feedbacks were given after each activity during their tutorial sessions because the students were practicing their presentation skills using the Interactive Whiteboard. It is also benefiting because it provides an opportunity for larger participation of class and it engages the learning process.

Apart from that, the learners were reinforced with the activities and assessed for the correct performance. The ninth step in Gagne's instructional events is to enhance attention and transfer of knowledge where the students will be required to present their

final graded assignment. Here the learners were to apply the new knowledge gained to conduct their final graded assignment as a group.

Interaction Design: The interaction design aspect focuses on the navigation and usability. To move from one page to another, the learner needs to either touch the page sorter arrow key or to touch the screen by moving the finger from left to right in order to move forward or right to left in order to move backwards.

Press the **Next Page** button to move forward through the Notebook file.

 Use the **Previous Page** button to move backward.

Figure 4.9 *Example of arrow key*

In addition to that, a simple navigation would be the touch screen approach either with a pen or finger to move from one slide to another. There were a number of useful features included in this module to make the exploration engaging and useful. Notes were inserted for each topic in order for the learners to get relevant information needed from the topic. Videos were also included here to enable the learners to comprehend this topic better.

Figure 4.10: *Screen shot of a link to a sample video presentation done by a student using the Interactive White Board.*

Presentation Design: When developing and designing this module, it was important to ensure that interface and layout were simple and consistent throughout the learning system. The aspects which were given due consideration were the background colour, text, icons, media elements and layout. Initially, a plain white background was selected. Later, combinations of light blue and white background were used because that combination was more attractive and clear. The Arial type font size 24 for the text was used. The font was chosen because it was simple, attractive and suitable for these learners.

The following font type and size were selected as they were attractive and easy to read.

Example:

Arial 24		texts
Verdana 28		Activity
Tahoma 36		Instruction

Both the evaluation and revision processes were done concurrently during the development and implementation process. Findings from the evaluation by the ID experts and the instructors were revised and changed before the module was implemented to the students. The module was then implemented to a group of foundation students.

Experts Opinion

Next, the experts experienced in the field of educational technology and the subject matter were chosen to assist in the development and the formative evaluation of the design. The objectives of these questions which include the second and third phase involves design and development process of the module according to the themes obtained from the needs analysis phase and expert's opinion are to determine relevant processes or criteria that needs to be incorporated into the design of the module integrating IWB as a presentation tool based on expert's opinion and to explore the expert's opinion and instructor's opinion on the initial phase of the development of this module. The data collected consisted of interviews with the experts on the design of the interactive presentation module. The data was then coded, and analysed into areas related to the design of the module.

The first section of this chapter, the areas concerned that emerged according to the experts' opinion is discussed. In the following section, the explanation of ways the areas of concern were addressed in the development of the module for the instruction on the topic of Oral Presentation Skills among foundation students was described.

Design of the Interactive Presentation Module: In this section, the fifth question is discussed directly:

"What are the opinions of the experts with regards to the design of this module using the interactive whiteboard?"

The group of five experts who were selected to help in the design and development of the interactive presentation module were based on their experience and expertise in the field of instructional technology as described in Chapter 3. The technical experts, TE1 and TE2, focused on the evaluation of the technical aspect and instructional design of the module, while the subject-matter experts, SME1, SME2 and SM3, concentrated on the area of presentation skills.

The experts assessed the course outline, the lesson's content and assessment questions. The experts were later interviewed to obtain information on comments and suggestions pertaining to the design of the module. Therefore, the findings were reported based on interviews with experts. The interview during the evaluation of the module was divided into the following areas which were the three elements focused on the development of this module namely information design, interaction design and presentation design as suggested by Kristof and Satran (1995).

Opinion of the experts with regards to the design of the module: Two experts in instructional design and three experts in the content did the formative evaluation of this module using the Interactive Whiteboard. The first part of the findings will be based on the interview findings from two experts in instructional design who have the knowledge and skills in instructional design. They evaluated the instructional structure, interaction, (navigation and usability) and presentation aspects and learning theories.

Instructions: Both the instructional design experts mentioned that the instructions were well structured, clear and easy to understand also suitable for the target learners. One of the experts mentioned that the information in this module is well structured, making it easy for the learners to understand the lesson.

Yes, the instructions were clear and easily understood. (LYS, TE1 ,67)

Navigation: Both the experts agreed that they did not have any difficulties with the scrolling of the module because it is easy to handle and user friendly. On the other hand, one of the experts is familiar with the arrow keys on the menu bar as well as touching the screen from left to right to move forward and the opposite to go back to the previous page.

There is no problem with the scrolling as it is easy and user friendly.
(LYS, TE1 81)

Usability: Both the experts agreed that this module was suitable for the target learners. One of the experts mentioned that the module using Interactive White Board supports various learning students such as audio and visual learners.

Hence, it can help the learning process and at the same time encompasses students various learning needs and style. In addition to that, the notes and activities were relevant in preparing the students to produce an interactive presentation for their final assignment.

This module has an additional benefit as it can train visual and audio learners to in-corporate kinesthetic approaches. (LYS, TE1, 94-95)

Presentation: Based on the feedback received from the two experts, it revealed that the slide design was neat, organized and suitable. Hence it was able to attract the students to explore the module. The background color was suitable. The type of font used was appropriate and can be easily read. Hence it is suitable for the target learners. Nevertheless, one of the experts suggested adding more images and animation to make the slides more attractive. Furthermore, both the experts also suggested that these foundation students can explore other Interactive White Board tools to enhance their presentation.

Yes, the slide design is clear and neat and relevant background colour was used. Do add images or clipart to the slides and expose students to more advance tools available in the Interactive White Board. (LYS, TE 1, 82-85).

Yes, would suggest using earthy and pastel colours for the slides and adding more visuals.
(EN, TE2, 125 -126)

Information Design

Three content experts had evaluated for the content or information design. They are all language lecturers from private higher learning institutions who have pedagogical knowledge and also curricular aspects in teaching and learning English to foundation students. They evaluated the information aspects, which emphasized on the objectives and learning outcomes, content delivery, activities and assessment plan and also the language and learning theories.

Objective, learning outcomes and content delivery: The findings revealed that the content experts found that the objectives of the module using the Interactive Whiteboard were clearly stated and related to the curriculum. The content of the module was suitable for the target learners. The instructions were simple and direct.

> *Yes, the objectives and learning outcomes are clear and appropriate for all levels of students.* (MIN, SME1, 78)

The language used is simple, easy to understand and with appropriate choice of words. Furthermore all three subject matter experts had agreed that materials provided in the module were relevant and had a clear flow that can help students understand the module better.

> *Yes, there is a clear transition between one sub topic to another.*
> (RIS, SME2, 83)

In addition to that, all three of them had mentioned that the module caters for students from various levels of proficiency and it motivates these students to come up with an interactive presentation using the Interactive White Board.

> *Yes. I totally agree. It is really easy for these students to use the Interactive White Board as these foundation students are digital native.* (RIS, SME2, 103-104)

Activities and assessment plan: Findings from the interview among all the three experts had indicated that the selection of activities and assessment plan in the module were relevant as those activities have prepared them to boost their confidence and motivated them to work as a team. In addition to that, one of the experts have commented that the assignment question had the needed requirements for these students to come up with an interactive presentation as it also contains the rubric which the students can use as advance criteria to come up with an effective presentation.

Yes, it will encourage them to garner team work and motivate them to work as a team. (MIN, SME1 84)

*Appropriate assessment plan which includes the requirements of the assignment and marking rubric was provided to guide the students to work on their assignment as a group. Plus, it's a group project, so the group members can motivate one another. (*PER, SME3, 98-100)

One of the experts had also mentioned that these activities were done during the students tutorial slots which had benefitted them. Due to the given practice and exposure, these students will be able to come up with an interactive presentation for their final presentation assignment.

They were given the time slots during their tutorials to practice these activities and with this given opportunity; they will be able to come up with a good presentation for their final submission. (RIS, SME2,107-109)

Hence, all three experts mentioned that the activities and assessment plan were useful and they had enabled these students to prepare themselves for the final presentation. Moreover, the selected assignment for these foundation students was appropriate as they have helped them come up with an interactive presentation with ease.

Yes. There is a range of activities prepared for these students and they were selected to prepare these students to come up with their final interactive presentation. (MIN, SME1, 169-170)

In terms of the assignment, the selection of task was relevant and suitable for the foundation students. All three experts have mentioned that the instructions and language used for the final assignment were relevant and direct.

The assignment is relevant and appropriate for all levels, the language and instructions are clear. (RIS, SME 2, 167-168)

In conclusion, the activities and the final assessment plan were suitable and it would encourage active and collaborative learning among the students. The experts had mentioned that these students had presented their content very well with little disruptions.

> *Students had used good sentence structure and hardly made any spelling mistakes on the slides. On the whole most students were confident presenters but a few especially the female students were soft-spoken and shy.* (RIS, SME2, 209-211)

> *Most of them were confident but some were nervous and it was reflected through their body language.* (MIN, SME1, 179-180)

> *The interactive presentation is quite impressive, because it helps students and audience focus on keywords or on important topics. In short, it helps both parties focus on the presentation flow. Such interactive presentation is a good tool to engage with the audience.* (PER, SME3, 230-232)

The overall impression that was concluded at the end of the interview by the experts were that the module and their final presentation enabled these foundation students to show case their creativity by coming up with an impressive presentation. Additionally, in particular, all three experts have mentioned that students were at ease using the Interactive White Board during the final presentation which allows for more participation among the audience and the presenter.

PHASE I: NEED ANALYSIS

Survey by students

11% of the students have experienced developing presentations using Interactive White Board.

46.2% strongly agree that learning to use Interactive White Board is like learning any other skills.

40.7% of the students believe that the lesson becomes more fun with the usage of the IWB.

These findings suggest that usage of the Interactive White Board is an idea worth venturing into the teaching and learning process.

Responses from the Programme Director and Lecturer

- Create an interactive presentation module
- Lack of a module guideline for lecturers to integrate the usage of Interactive White Board in the classroom.
- The interactive tools are relevant and can make the presentation process more focused, engaging and convincing.

PHASE 2 : DESIGN AND DEVELOPMENT OF THE MODULE

INFORMATION DESIGN

Based on Gagne's Nine Instructional Events.
1. Content 2. Objective 3. Learning Outcome 4. Content presentation 5. learning guidance 6. elicit performance 7. feedback 8. performance assessment 9. Attention enhancement and knowledge transfer.

Software - Multi-Touch Board Diver, Multi-Touch Board and Multi Touch Lite-Board

INTERACTION DESIGN

- Focuses on the navigation and usability.
- A simple navigation would be the touch screen using the pens
- Useful features for the exploration with engaging available tools
- Notes on verbal presentation skills
- Videos on effective presentation and usage of Interactive White Board- to enable the learners to comprehend this topic and tools better.

PRESENTATION DESIGN

- Ensure that interface and layout were simple and consistent throughout the learning system.
- The aspects which were given due consideration were the background colour, text, icons, media elements and layout.

Figure 4.11 Developing an Interactive Presentation module using Interactive White Board.

Findings of Phase 3: The Implementation and Evaluation

The Interactive Presentation module was implemented on a group of Foundation students. In the earlier phase, which are the design and development phase the Interactive White Board was used based on ADDIE's model. The formative evaluation was then conducted by a team of experts and the module was improvised. This updated version of the module was used for this phase of the study.

The research questions in Phase 3 are as follows:

1. Is there a difference in perception among students in using PowerPoint slides and Interactive White Board in the following area?

   a. Gender

   b. Ethnicity

   c. Proficiency level for speaking and writing

2. Is there a difference in performance among students in using PowerPoint slides and Interactive White Board?

3. Does the usage of Interactive White Board improve the overall perception of presentation skills in comparison to the conventional PowerPoint presentation method?

The participants in the context of the study were foundation students. The final assignment that involves an interactive presentation was given to the controlled group which consists of 71 students. On completion of this final assignment, the participants were surveyed (n=145) and interviewed (n=10) on the use of the module. The research question in this phase was to decide on the usage of the presentation skills module using the Interactive White Board from the point of view of the users. The participants' views and findings were divided into formative and summative evaluation.

151

Survey: The formative evaluation was done by all 71 students who had done the presentation using the Interactive White Board. For comparative purposes, another group consisting of 74 students who did their presentation using the conventional PowerPoint method was also surveyed. All the variables in this study were normality distributed (APPENDIX A).

Respondents Background: Table 4.6 gives the characteristics of the students who participated. There were a total of 145 students' altogether, divided into two groups; learning with Microsoft PowerPoint Presentation (PPT) (74/145, 51.0%) and learning using the Interactive Whiteboard (IWB) (71/145, 49.0%). All of the students aged between 18 to 20 years old, majority being Chinese in both the PPT (64.9%) and IWB (77.5) group. Around 10% of the respondents fall into 'other races' that included the aborigines and international students. More than 80% of the students of both the groups have never attended any extra English course. Among those who have attended, IELTS, O-level and ICGSE were prominent.

Table 4.6:

Characteristics of Respondents (n=145)

Characteristics	N (%)	
	PowerPoint Presentation (n=74)	Interactive Whiteboard (n=71)
Gender		
Male	32 (43.2)	43 (60.6)
Female	42 (56.8)	28 (39.4)
Ethnicity		
Malay	16 (21.6)	8 (11.3)
Chinese	48 (64.9)	55 (77.5)
Indian	2 (2.7)	0
Others	8 (10.8)	8 (11.2)
English Course		
Yes	8 (10.8)	11 (15.5)
No	66 (89.2)	60 (84.5)

Figure 4.12 below illustrates the medium of instruction at school that the students studied. More than half of them came from *sekolah kebangsaan* (SK) which uses *Bahasa*

Melayu as the instructional medium. Close to one-third of them came from schools that use English as the instructional medium. Comparatively, they were more SK school students in the PPT group and more English medium students in IWB group.
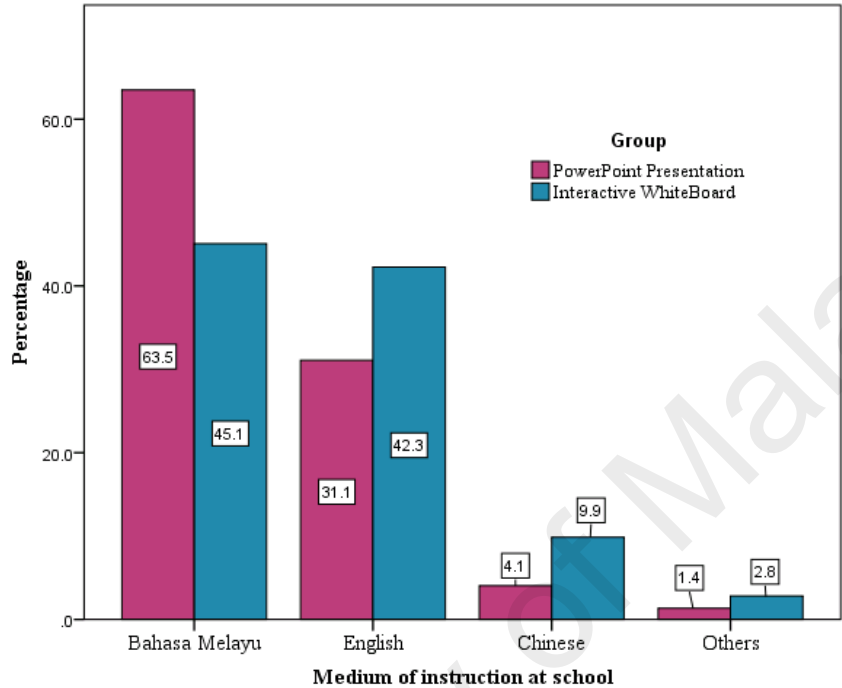
Figure 4.12 *Students Distribution for Medium of Instruction at School*

Figure 4.13 and 4.14 shows the students spoken and written English language proficiencies. Majority of the students had good spoken proficiency (PPT vs. IWB = 46/74, 62.2% vs. 41/71, 57.7%) and written proficiency (PPT vs. IWB = 39/74, 52.7% vs. 38/71, 53.5%). However, only close to one in five students had excellent spoken as well as written proficiency whereby for spoken proficiency: PPT vs. IWB = 14/74, 18.9% vs. 11/71, 15.5% while for written proficiency: PPT vs. IWB = 18/74, 24.3% vs. 10/71, 14.1%. Overall, there were three students who were weak in speaking as well as writing English.

Spoken English Fluency
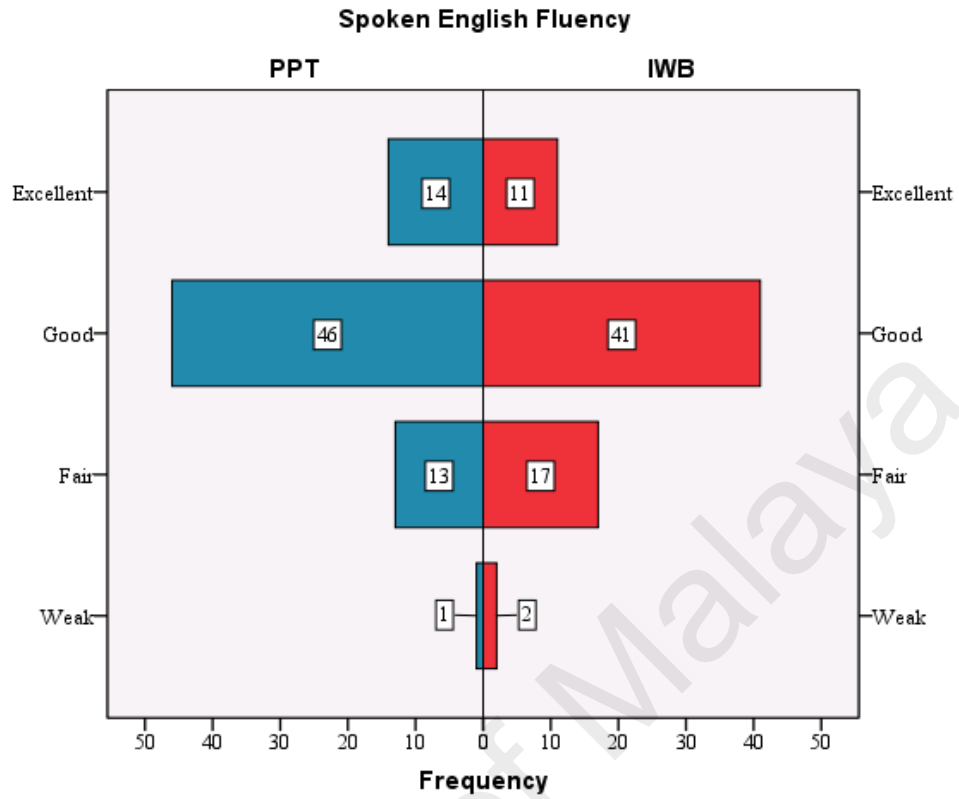
Figure 4.13: *Distribution of English Speaking Fluency among the Student*

Written English Fluency
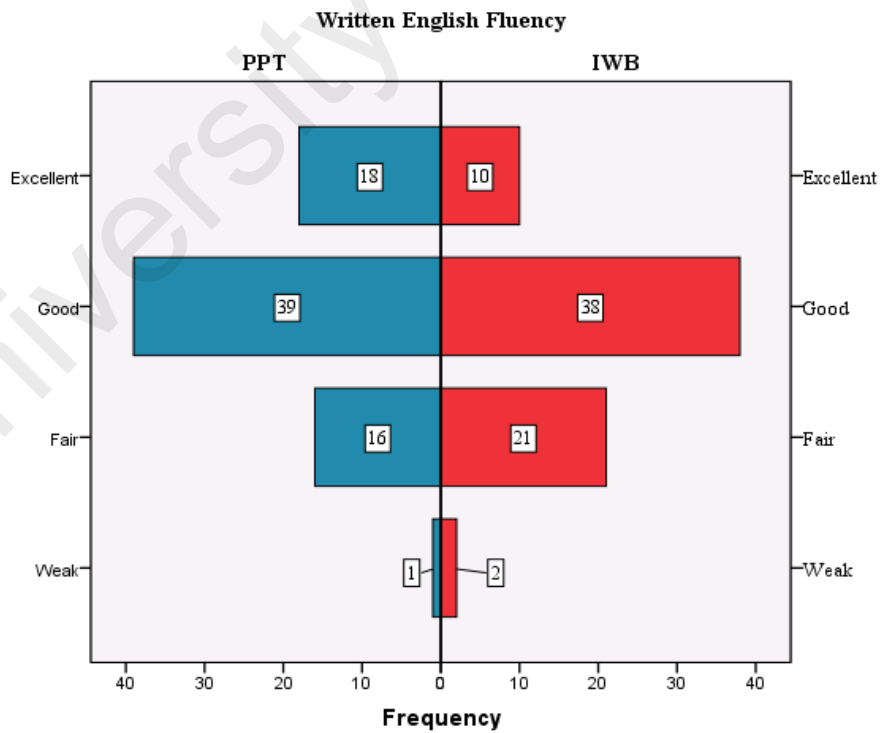
Figure 4.14: *Distribution of English Writing Fluency among the Students*

154

Exploratory Factor Analysis (EFA)

Inferential statistics are used to draw conclusions from data that might not be immediately obvious and to support the study hypotheses. It included common tests such as t-tests, ANOVA tests, ANCOVA test and factor analysis to validate the hypotheses of current study.

A principle component factor analysis was computed to determine the factor structure among 22 items related to perception of students on technology used in classroom. The identified factors were tested for factorability of correlation using several criteria. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.802, above the suggested value of 6 with a significant Bartlett's test of sphericity ($\chi^2_{(210)}$ = 839.22, p < 0.0001).

Initial communalities which estimates the variance in each variable showed that all the variables have acceptable extraction with above threshold of 0.30 (range: 0.36 - 0.66). The anti-image correlation had diagonals above 0.5, which indicates that each item fit into factor analysis. The correlation matrix indicated that each item was moderately associated or correlated with each of the other items. The correlation matrix showed no extreme multi-collinearity or singularity within the items.

The determinant was equivalent to 0.02 which was greater than 0.0001 indicating no multi-collinearity. Scree plot shows that there were five factors extracted at Eigen value greater than 1 (Figure 4.15). Table 4.7 gives the Eigenvalue, variables extracted under each factor and the respective factor loadings

Each factor corresponds to one domain. Items with < 0.25 factor loadings for each factor were eliminated for simplicity. The larger the loading of a given item to the factor, the greater the contribution of that item to a specific factor.
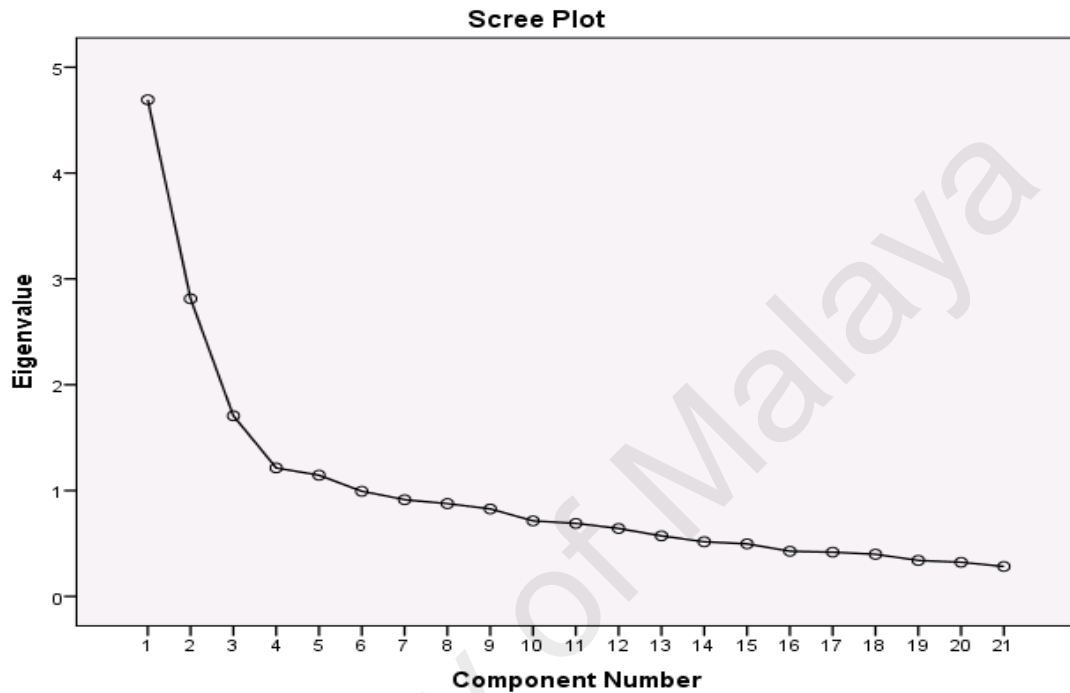
Scree Plot

Figure 4.15: *Scree Plot of Extracted Principle Components*

Based on Table 4.7, of 22 variables, 20 were extracted into five factors, explaining 55.1% of total variance in student's perception. The first factor with an Eigen value of 4.693, extracted five items related to drawbacks of technology usage for presentation and named as Domain 1: shortcomings of presentation with technology. The loadings showed a strong correlation between the items extracted. The second PC with an Eigen value of 2.812 also extracted five items but related to advantages of technology usage in teaching and learning and as a presentation tool named as Domain 2: effectiveness of using of technology to enhance presentation.

The loadings showed a moderate to strong correlation between the items extracted. The third factor, with an Eigen value of 1.706, extracted three items which were related to technology use in assignments and presentation named as Domain 3: engaging presentation tool

The loadings showed a strong correlation between the items extracted. The fourth factor, with an Eigen value of 1.214, extracted four items. The items were related to psychological acceptance of technology usage and named as Domain 4: perception on effectual communication tool. The loadings showed a moderate to strong correlation between the items extracted. Lastly, the fifth factor with an Eigen value of 1.145 extracted three items which were also related to student's acceptance but in teaching and learning as well as assignments and was named as Domain 5: perception on student enthusiasm using technology. The loadings showed a moderate to strong correlation between the items extracted.

Table 4.7:

Principle Component Analysis with Varimax rotation for 22 items related to students'
perception, Eigen Value, Factor Loading and the Domain

No	Items	Components					Communality
		D1	D2	D3	D4	D5	
1	Presentations take a longer time using computer.	.740					.660
2	Using the technology tool / computer is difficult for a verbal presentation.	.729					.529
3	Can learn more from books than watch a presentation using a computer.	.720					.577
4	Act like doing assignment in class, especially if instructions not understood.	.697					.542
5	Tired of using technology in the classroom.	.672					.505
6	Enjoy classroom instruction using technology.		.729				.661
7	Can get a good job if able to use technology/computer for presentation.		.719				.381
8	Gain more opportunities to learn new things.		.696				.520

157

No	Items	Components					Communality
		D1	D2	D3	D4	D5	
9	Would work harder if technology is used more often for a verbal presentation.		.609				.444
10	It is important to be able to use technology for verbal presentation.		.554				.505
11	It is important to do the best in all assignment given especially if good presentation skills are acquired.			.719			.583
12	Pay attention during a presentation if it is attractive and easily understood with the aid of technology or computer.			.690			.488
13	Always try to complete assignments.			.654			.634
14	Using the computer for a presentation is not scary.				.689		.628
15	Not nervous when using the computer for a presentation.			.	.595		.614
16	Comfortable using the computer for verbal presentation.				.569		.356
17	Want to work with technology whenever possible.				.549		.604
18	Can concentrate better on the lesson with technology use in presentation.					.683	.625
19	Would enjoy studies better especially for verbal presentation skills if technology is used for presentation.		.			.572	.629
20	Would work harder on presentation assignments if technology is often used.					.515	.579
21	Understand the lesson better with technology use in presentation.						.506
	Eigen value	**4.693**	**2.812**	**1.706**	**1.145**	**1.214**	

Table 4.8 to 4.17 shows the statistics of the pre-test score of the survey on student's perception. Students were requested to identify their feelings that best describe the statements given. The responses were 1 (strongly disagree), 2 (disagree), 3 (agree) and 4 (strongly agree).

Domain 1: Shortcomings of presentation with technology

Table 4.8 shows the pre-test survey results for shortcomings on presentation with technology while table 4.9 shows the post-test survey results. During pre-test, most of the students of both the PPT and IWB group strongly disagree their lesson takes a longer time using technology, using technology is difficult for presentation, they can learn more

158

from books or that they just act as if they are working in the class, especially when they

do not understand the instructions given and that that they are tired of using technology

in the classroom, (mode = 1.0). Mann-Whitney U-test showed PPT group disagreed

significantly more than the IWB group that it is difficult to use technology for

presentation (p=0.035), can learn more from books (p=0.042) and using technology in

classroom is tiring (p=0.021). During post-test, similar to pre-test, most students of both

PPT and IWB group strongly disagree that they are tired of using technology in the

classroom, their lesson takes a longer time using technology, using technology is difficult

in learning, they can learn more from books or that they just act as if their working in the

class (mode = 1.0). None of the perception significantly differed between the groups.

Table 4.8:

Analysis of Pre-test Survey for Domain 1

	PPT Group (n=74)			IWB Group (n=71)			
	Median (IQR)	Mean ± SD	Mode	Median (IQR)	Mean ± SD	Mode	p-value
Presentations take a longer time using computer.	2.0 (2.0)	2.0 ± 1.03	1.0	2.0 (2.0)	2.2 ± 1.05	1.0	0.277
Using the technology tool / computer is difficult for a verbal presentation.	1.0 (1.0)	1.6 ± 0.83	1.0	2.0 (1.0)	1.9 ± 0.93	1.0	0.035*
Can learn more from books than watch a presentation using a computer.	2.0 (1.0)	1.8 ± 0.91	1.0	2.0 (2.0)	2.1 ± 1.06	1.0	0.042*
Act like doing assignment in class, especially if instructions not understood.	1.0 (2.0)	1.8 ± 1.03	1.0	1.0 (1.0)	1.8 ± 0.93	1.0	0.967
Tired of using technology in the classroom.	2.0 (1.0)	1.6 ± 0.71	1.0	2.0 (2.0)	2.1 ± 1.04	1.0	0.021*

* Significant p-value at 0.05

Table 4.9:

Analysis of Post-test Survey for Domain 1

	PPT Group (n=74)			IWB Group (n=71)			
	Median (IQR)	Mean ± SD	Mode	Median (IQR)	Mean ± SD	Mode	p-value
Presentations take a longer time using computer.	1.0 (1.0)	1.7 ± 1.05	1.0	1.0 (1.0)	1.5 ± 0.88	1.0	0.257
Using the technology tool / computer is difficult for a verbal presentation.	1.0 (0)	1.3 ± 0.78	1.0	1.0 (0)	1.4 ± 0.79	1.0	0.832
Can learn more from books than watch a presentation using a computer.	1.0 (1.0)	1.5 ± 0.86	1.0	1.0 (1.0)	1.4 ± 0.69	1.0	0.311
Act like doing assignment in class, especially if instructions not understood.	1.0 (0)	1.5 ± 0.89	1.0	1.0 (0)	1.3 ± 0.68	1.0	0.257
Tired of using technology in the classroom.	1.0 (1.0)	1.4 ± 0.51	1.0	1.0 (1.0)	1.3 ± 0.60	1.0	0.768

Domain 2: Effectiveness of using technology to enhance presentation

Table 4.10 shows the pre-test survey results for effectiveness of using technology to enhance presentation while table 4.11 shows the post-test survey results. During pre-test, for PPT group, at least half of the students strongly agree that they enjoy classroom instruction using technology with a median of 4.0 (IQR=1.0) and a mean of 3.6 (SD=0.66). The students also strongly feel that they will be able to get a good job if they know how to use technology in learning; median (IQR) = 4.0(1.0) and mean±SD = 3.6±0.64. They do strongly believe that it is important for them to be able to use technologies such as computer in learning and preparing assignments; median (IQR) = 4.0(1.0) and mean±SD = 3.5±0.53. Most of them also agreed (mode = 3.0) and strongly agreed (mode = 4.0) that they work harder if technology is used more often for a verbal presentation and they gain more opportunities to learn things with technologies, respectively.

At least half of the students in the IWB group strongly believes that using technology in teaching and learning gives them more opportunities to learn new things (median (IQR) = 4.0(1.0); mean±SD = 3.5±0.37). Similar to PPT group, most students in IWB group also strongly agree (mode = 4.0) that they enjoy classroom instruction using technology. At least half IWB group students agreed (median = 3.0) that can get a good job and would work harder if technology is incorporated for presentation and it is important for them to use technology in presentation.

Mann-Whitney U-test for pre-test showed PPT group to agree significantly more than the IWB group that they enjoy classroom instruction using technology (p=0.011), can get a good job if able to use technology/computer for presentation (p=0.001) and it is important to be able to use technology for verbal presentation (p=0.018).

During post-test, for the PPT group, consistent with the pre-test, at least half of the students strongly agree that they enjoy classroom instruction using technology, median (IQR) = 4.0(1.0); mean±SD = 3.5±0.53 as well as feels that they will be able to get a good job if they know how to use technology; median (IQR) = 4.0(1.0) and mean±SD = 3.4±0.66. In addition, the students feel that they gain more opportunities to learn new things when they use PPT slides and computer for presentation; median (IQR) = 4.0(1.0) and mean±SD = 3.5±0.37. In contrast to the pre-test, positive perception was observed among IWB group after the intervention. At least half of the students strongly agree that they enjoy classroom instruction using technology; median (IQR) = 4.0(0); mean±SD = 4.0±0.20. Majority students now feel that that it is important to be able to use various technologies; median (IQR) = 4.0(1.0); mean±SD = 3.7±0.48.

In contrast to pre-test score, Mann-Whitney U-test showed that IWB agreed significantly more than the IWB group that they enjoy classroom instruction using

technology (p<0.001**), can get a good job if able to use technology/computer for presentation (p<0.001**) and it is important to be able to use technology for verbal presentation (p=0.026).

Table 4.10:

Analysis of Pre-test Survey for Domain 2

	PPT Group (n=74)			IWB Group (n=71)			
	Median (IQR)	Mean ± SD	Mode	Median (IQR)	Mean ± SD	Mode	p-value
Enjoy classroom instruction using technology.	4.0 (1.0)	3.6 ± 0.66	4.0	3.0 (1.0)	3.4 ± 0.68	4.0	0.011*
Can get a good job if able to use technology/computer for presentation.	4.0 (1.0)	3.6 ± 0.64	4.0	3.0 (1.0)	3.2 ± 0.76	3.0	0.001*
Gain more opportunities to learn new things.	3.5 (1.0)	3.3 ± 0.54	4.0	4.0 (1.0)	3.5 ± 0.37	4.0	0.841
Would work harder if technology is used more often for a verbal presentation.	3.0 (1.0)	3.1 ± 0.78	3.0	3.0 (1.0)	3.2 ± 0.68	3.0	0.690
It is important to be able to use technology for verbal presentation.	4.0 (1.0)	3.5 ± 0.53	4.0	3.0 (1.0)	3.3 ± 0.63	3.0	0.018*

* Significant p-value at 0.05

Table 4.11:

Analysis of Post-test Survey for Domain 2

	PPT Group (n=74)			IWB Group (n=71)			
	Median (IQR)	Mean ± SD	Mode	Median (IQR)	Mean ± SD	Mode	p-value
Enjoy classroom instruction using technology.	4.0 (1.0)	3.5 ± 0.53	4.0	4.0 (0)	4.0 ± 0.20	4.0	<0.001**
Can get a good job if able to use technology/computer for presentation.	4.0 (1.0)	3.4 ± 0.66	4.0	4.0 (1.0)	3.9 ± 0.38	4.0	<0.001**
Gain more opportunities to learn new things.	4.0 (1.0)	3.5 ± 0.37	4.0	3.5 (1.0)	3.5 ± 0.43	4.0	0.298
Would work harder if technology is used more often for a verbal presentation.	3.0 (1.0)	3.4 ± 0.69	3.0	3.0 (1.0)	3.3 ± 0.73	3.0	0.642
It is important to be able to use technology for verbal presentation.	3.0 (1.0)	3.5 ± 0.53	3.0	4.0 (1.0)	3.7 ± 0.48	4.0	0.026*

* Significant p-value at 0.05; ** Significant p-value at 0.001

Domain 3: Engaging presentation tool

Table 4.12 shows the pre-test survey results for engaging presentation tool while table 4.13 shows the post-test survey results. During pre-test, at least half of the students of both groups strongly agreed that they believe it is important to do the best in all assignment given especially if good presentation skills are acquired; median (IQR) = 4.0 (1.0). Similarly, at least half of the PPT and IWB group students agreed that they pay attention during a presentation if it is attractive and easily understood with the aid of technology or computer; median (IQR) = 3.0 (1.0) vs 3.0 (0) respectively. Majority of them strongly agreed that they always try to complete assignments (mode = 4.0). None of these perceptions significantly differed between the groups (p>0.05).

During post-test, it was found that usage of the IWB able to draw students' attention during a presentation; median (IQR) = 4.0(1.0); mean±SD = 3.5±0.50. The students also strongly agreed that it is important for them to do the best in all assignment (median (IQR) = 4.0(0); mean±SD = 3.8±0.38) and they would always try to complete the assignments (median (IQR) = 4.0(1.0); mean±SD = 3.6±0.48). The first two perceptions was significantly higher than their PPT counterpart (p = 0.016 and p<0.001 respectively).

Table 4.12:

Analysis of Pre-test Survey for Domain 3

	PPT Group (n=74)			IWB Group (n=71)			
	Median (IQR)	Mean ± SD	Mode	Median (IQR)	Mean ± SD	Mode	p-value
It is important to do the best in all assignment given especially if good presentation skills are acquired.	4.0 (1.0)	3.5 ± 0.62	4.0	4.0 (1.0)	3.6 ± 0.60	4.0	0.258
Pay attention during a presentation if it is attractive and easily understood with the aid of technology or computer.	3.0 (1.0)	3.2 ± 0.73	3.0	3.0 (0)	3.1 ± 0.64	3.0	0.058
Always try to complete assignments.	4.0 (1.0)	3.5 ± 0.58	4.0	3.0 (1.0)	3.4 ± 0.63	4.0	0.478

Table 4.13:

Analysis of Post-test Survey for Domain 3

	PPT Group (n=74)			IWB Group (n=71)			
	Median (IQR)	Mean ± SD	Mode	Median (IQR)	Mean ± SD	Mode	p-value
It is important to do the best in all assignment given especially if good presentation skills are acquired.	4.0 (1.0)	3.6 ± 0.56	4.0	4.0 (0)	3.8 ± 0.38	4.0	0.016*
Pay attention during a presentation if it is attractive and easily understood with the aid of technology or computer.	3.0 (1.0)	3.1 ± 0.65	3.0	4.0 (1.0)	3.5 ± 0.50	4.0	<0.001**
Always try to complete assignments.	4.0 (1.0)	3.6 ± 0.49	4.0	4.0 (1.0)	3.6 ± 0.48	4.0	0.512

* Significant p-value at 0.05; ** Significant p-value at 0.001

Domain 4: Perception on effectual communication tool

Table 4.14 shows the pre-test survey results for perception on effectual communication tool while table 4.15 shows the post-test survey results. The pre-test and post-test had similar score similarly across both groups. Overall, most of the students agreed that

164

(mode=3.0) using the computer for presentation does not scare them, they are not nervous when using the computer for a presentation but comfortable using it for verbal presentation and want to work with technology whenever possible.

Table 4.14:

Analysis of Pre-test Survey for Domain 4

	PPT Group (n=74)			IWB Group (n=71)			p-value
	Median (IQR)	Mean ± SD	Mode	Median (IQR)	Mean ± SD	Mode	
Using the computer for a presentation is not scary.	3.0 (0)	3.0 ± 0.70	3.0	3.0 (0)	3.0 ± 0.55	3.0	0.703
Not nervous when using the computer for a presentation.	3.0 (1.0)	3.0 ± 0.77	3.0	3.0 (0)	3.0 ± 0.53	3.0	0.559
Comfortable using the computer for verbal presentation.	3.0 (1.0)	3.3 ± 0.74	3.0	3.0 (0)	3.1 ± 0.64	3.0	0.070
Want to work with technology whenever possible.	3.0 (0)	2.9 ± 0.82	3.0	3.0 (1.0)	3.1 ± 0.75	3.0	0.327

Table 4.15:

Analysis of Post-test Survey for Domain 4

	PPT Group (n=74)			IWB Group (n=71)			p-value
	Median (IQR)	Mean ± SD	Mode	Median (IQR)	Mean ± SD	Mode	
Using the computer for a presentation is not scary.	3.0 (0)	3.0 ± 0.61	3.0	3.0 (0)	3.1 ± 0.58	3.0	0.255
Not nervous when using the computer for a presentation.	3.0 (0)	3.0 ± 0.75	3.0	3.0 (1.0)	3.1 ± 0.72	3.0	0.256
Comfortable using the computer for verbal presentation.	3.0 (1.0)	3.4 ± 0.51	3.0	3.0 (1.0)	3.5 ± 0.56	3.0	0.335
Want to work with technology whenever possible.	3.0 (1.0)	3.0 ± 0.85	3.0	3.0 (0)	3.0 ± 0.62	3.0	0.817

Domain 5: Perception on student enthusiasm using technology

Table 4.16 shows the pre-test survey results for perception on student enthusiasm using technology while table 4.17 shows the post-test survey results.

165

The pre-test test showed that, at least half students from each group perceived that they can concentrate better on the lesson with technology use in presentation, median (IQR) = 3.0 (1.0). At least half students of PPT and IWB group strongly agreed and agreed correspondingly that they would enjoy studies better especially for verbal presentation skills if technology is used for presentation (median (IQR) = 4.0 (1.0) vs 3.0 (1.0)). They also agreed would work harder on presentation assignments if technology is often used; median (IQR) = 3.0 (1.0). Mann-Whitney U-test for pre-test showed PPT group to agree significantly more than the IWB group that they would enjoy studies better especially for verbal presentation skills if technology is used for presentation (p = 0.018).

For post-test, at least half PPT group students agreed that they can concentrate better on the lesson, would enjoy studies better and work harder on presentation assignments if technology is used; median (IQR) = 3.0 (1.0). For IWB group, while at least half agreed that they would enjoy studies better and work harder on presentation assignments if technology is used; median (IQR) = 3.0 (1.0), they strongly agreed that they can concentrate better on the lesson; median (IQR) = 4.0 (1.0). In contrast to pre-test, post test results revealed that, more IWB group students significantly perceived that they can concentrate better on the lesson with technology use in presentation (p<0.001).

Table 4.16:

Analysis of Pre-test Survey for Domain 5

	PPT Group (n=74)			IWB Group (n=71)			
	Median (IQR)	Mean ± SD	Mode	Median (IQR)	Mean ± SD	Mode	p-value
Can concentrate better on the lesson with technology use in presentation.	3.0 (1.0)	3.1 ± 0.83	3.0	3.0 (1.0)	3.3 ± 0.48	3.0	0.174
Would enjoy studies better especially for verbal presentation skills if technology is used for presentation.	4.0 (1.0)	3.5 ± 0.53	4.0	3.0 (1.0)	3.3 ± 0.63	3.0	0.018*
Would work harder on presentation assignments if technology is often used.	3.0 (1.0)	2.8 ± 0.68	4.0	3.0 (1.0)	2.9 ± 0.76	3.0	0.277

* Significant p-value at 0.05

Table 4.17:

Analysis of Post-test Survey for Domain 5

	PPT Group (n=74)			IWB Group (n=71)			
	Median (IQR)	Mean ± SD	Mode	Median (IQR)	Mean ± SD	Mode	p-value
Can concentrate better on the lesson with technology use in presentation.	3.0 (1.0)	3.2 ± 0.97	3.0	4.0 (1.0)	3.7 ± 0.48	4.0	<0.001**
Would enjoy studies better especially for verbal presentation skills if technology is used for presentation.	3.0 (1.0)	3.4 ± 0.55	3.0	3.0 (1.0)	3.5 ± 0.56	4.0	0.838
Would work harder on presentation assignments if technology is often used.	3.0 (1.0)	2.8 ± 0.77	4.0	3.0 (1.0)	2.9 ± 0.71	3.0	0.457

** Significant p-value at 0.001

Perception of Students on Technology Used Among PowerPoint Presentation and Interactive Whiteboard Group

Perception on shortcomings of presentation with technology (Domain 1) between PowerPoint presentation and Interactive Whiteboard group: In order to evaluate the actual effectiveness, the mean score was compared for pre-test and post-test between the IWB and PPT groups. The paired t-test was used to determine whether there are any significant differences in the pre-test and post-test score for PPT and IWB group separately.

Students' perception on shortcomings of presentation with technology (Domain 1) improved significantly after introduced both PPT (3.25 ± 0.61 vs. 3.53 ± 0.51, t (73) = -3.26, p = 0.002) and IWB (3.00 ± 0.80 vs. 3.63 ± 0.47, t (70) = -5.63, p <0.0001). This showed that the previous usage of technology in teaching was poor in both group, and introduction of any kind of technology improved their perception, however the improvement was higher among students in IWB group (Table 4.18).

Table 4.18

Student's Perception on Domain 1 among PPT and IWB Group

Group	Mean Score ± SD		Mean difference	t	Df	p-value
	Pre-test	Post-test				
PowerPoint Presentation (PPT) (n=74)	3.25 ± 0.61	3.53 ± 0.51	-0.29	-3.26	73	0.002*
Interactive Whiteboard (IWB) (n=71)	3.00 ± 0.80	3.63 ± 0.47	-0.62	-5.63	70	<0.0001*

* Significant p-value at 0.05
t – paired t test

On the other hand, one-way ANCOVA was used to determine whether there is any significant difference between the treatment groups on their perception for using

168

technology in learning English language, after adjusting for the pre-test score. In one-way ANCOVA, students in IWB group showed a better improvement in perception in domain 1 compared to PPT in post-test after adjusted with pre-test perception (3.53 ± 0.06 vs. 3.63 ± 0.06). The improvement was higher among IWB compared to PPT but was not significant ($F = 1.42$, $p = 0.236$) (Table 4.19).

Table 4.19

Comparing Means of Perception on Domain 1 Adjusting for Pre-test Score

Outcomes	Adjusted Mean ± SE		F	p-value
	PPT	IWB		
Student's Perception for using IWB in English Teaching and Learning	3.53 ± 0.06	3.63 ± 0.06	1.42	0.236

* Significant p-value at 0.05
F = one-way ANCOVA

Perception on effectiveness of using technology to enhance presentation (Domain 2) between PowerPoint presentation and Interactive Whiteboard group: There was no difference observed in perception on effectiveness of using technology to enhance presentation (domain 2) in PPT group (3.45 ± 0.46 vs. 3.45 ± 0.31, $t (73) = 0.04$, $p = 0.966$). In IWB group, the perception of students in domain 2 improved from 3.26 ± 0.51 to 3.66 ± 0.29. A significant improvement in perception in domain 2 was observed between pre-test and post-test in IWB group ($T (70) = - 5.71$, $p < 0.0001$) (Table 4.20). This indicated that IWB usage in teaching effectively enhance the presentation skills and interest of students.

Table 4.20

Student's Perception on Domain 2 among PPT and IWB Group

Group	Mean Score ± SD		Mean Difference	t	df	p-value
	Pre-test	Post-test				
PowerPoint Presentation (PPT) (n=74)	3.45 ± 0.46	3.45 ± 0.31	0.003	0.04	73	0.966
Interactive Whiteboard (IWB) (n=71)	3.26 ± 0.51	3.66 ± 0.29	-0.40	-5.71	70	< 0.0001*

* Significant p-value at 0.05

t – paired t test

The improvement in perception of students in domain 2 was significantly higher among IWB in post-test compared to PPT after adjusting for perception in pre-test (3.45 ± 0.04 vs. 3.67 ± 0.04, F = 18.48, p <0.0001). This indicates that students can enhance their presentation skills effectively with the usage of IWB (Table 4.21).

Table 4.21

Comparing Means of Perception on Domain 2 Adjusting for Pre-test Score

Outcomes	Adjusted Mean ± SE		F	p-value
	PPT	IWB		
Student's Perception for using IWB in English Teaching and Learning	3.45 ± 0.04	3.67 ± 0.04	18.48	<0.0001*

* Significant p-value at 0.05

F = one-way ANCOVA

Perception on engaging presentation tool (Domain 3) between PowerPoint presentation and Interactive White Board group

There was no difference observed in perception on engaging presentation tools (domain 3) in PPT group between pre-test and post-test (3.41 ± 0.49 vs. 3.45 ± 0.38, t (73) = - 0.790, p = 0.432). In IWB group, the perception of students in domain 3 improved from 3.36 ± 0.49   to 3.67 ± 0.26.

A significant improvement in perception in domain 3 was observed between pre-test and post-test in IWB group (t (70) = - 5.076, p < 0.0001) (Table 4.22). This indicated that engaging IWB as a presentation tool effectively improved student's perception on teaching and learning in English (Table 4.22).

Table 4.22

Student's Perception on Domain 3 among PPT and IWB Group

Group	Mean Score ± SD		Mean difference	t	df	p-value
	Pre-test	Post-test				
PowerPoint Presentation (PPT) (n=74)	3.41 ± 0.49	3.45 ± 0.38	-0.05	-0.790	73	0.432
Interactive Whiteboard (IWB) (n=71)	3.36 ± 0.49	3.67 ± 0.26	-0.31	-5.076	70	< 0.0001*

* Significant p-value at 0.05
t – paired t test

The improvement in perception of students in domain 3 was significantly higher among IWB in post-test compared to PPT after adjusting for perception in pre-test (3.42 ± 0.06 vs. 3.62 ± 0.06, F = 1.752, p = 0.012). The result indicated that usage of IWB as the presentation tool has improved their overall perception in the teaching and learning of English (Table 4.23).

Table 4.23

Comparing Means of Perception on Domain 3 Adjusting for Pre-test Score

Outcomes	Adjusted Mean ± SE		F	p-value
	PPT	IWB		
Student's Perception for using IWB in English Teaching and Learning	3.42 ± 0.06	3.62 ± 0.06	1.752	0.012*

* Significant p-value at 0.05
F = one-way ANCOVA

Perception on effectual communication tool (Domain 4) between PowerPoint presentation and Interactive Whiteboard group: Usage of PPT and IWB as communication tool both have improved students perception, however the improvement was significant among students who were introduced with IWB. Only small and non-significant improvement was observed among PPT group between pre-test and post-test (3.05 ± 0.52 vs. 3.09 ± 0.45, t (73) =-0.511, $p = 0.611$). However students' perception that IWB can be used as effectual communication tool improved from 3.04 ± 0.43 to 3.18 ± 0.32, significantly (t (70) = - 2.065, $p = 0.043$) (Table 4.24).

Table 4.24

Student's Perception on Domain 4 among PPT and IWB Group

Group	Mean Score ± SD		Mean Difference	t	df	p-value
	Pre-test	Post-test				
PowerPoint Presentation (PPT) (n=74)	3.05 ± 0.52	3.09 ± 0.45	-0.04	-0.511	73	0.611
Interactive Whiteboard (IWB) (n=71)	3.04 ± 0.43	3.18 ± 0.32	-0.14	-2.065	70	0.043*

* Significant p-value at 0.05
t – paired t test

After adjusted to pre-test score, there is no significant change in post-test score compared between PPT and IWB group. This showed although individually, IWB was considered as effectual communication tool, but after direct compared to PPT with controlling the perception during pre-test, introducing IWB or PPT showed no significant different in student's perception (Table 4.25).

Table 4.25

Comparing Means of Perception on Domain 4 Adjusting for Pre-test Score

Outcomes	Adjusted Mean ± SE		F	p-value
	PPT	IWB		
Student's Perception for using IWB in English Teaching and Learning	3.05 ± 0.06	3.04 ± 0.06	0.001	0.980

* Significant p-value at 0.05
F = one-way ANCOVA

Perception on student enthusiasm using technology (Domain 5) between PowerPoint presentation and Interactive Whiteboard group: Students' perception on enthusiasm using technology reduced in post-test compared to pre-test in both PPT and IWB group. The reduction in PPT showed no significant difference (2.95 ± 0.56 vs. 2.94 ± 0.51, t (73) = 0.054, $p =$ 0.957). However, a borderline reduction in students enthusiasm using IWB was observed between pre-test and post-test (3.29 ± 0.41 vs. 3.16 ± 0.40, t (70) =1.921, $p =$ 0.059). This indicate that types of technology used during teaching and learning English still not able to encourage the student to practice the same method (Table 4.26)

Table 4.26

Student's Perception on Domain 5 among PPT and IWB Group

Group	Mean Score ± SD		Mean Difference	t	df	p-value
	Pre-test	Post-test				
PowerPoint Presentation (PPT) (n=74)	2.95 ± 0.56	2.94 ± 0.51	0.005	0.054	73	0.957
Interactive Whiteboard (IWB) (n=71)	3.29 ± 0.41	3.16 ± 0.40	0.13	1.921	70	0.059

* Significant p-value at 0.05
t – paired t test

However, after adjusted to pre-test score, the post-test score was significantly higher among IWB group compared to PPT group (2.96 ± 0.06 vs. 3.28 ± 0.06, $F = 14.79$, $p < 0.0001$). Students who exposed to IWB technique significantly have better enthusiasm compared to those who exposed to PPT technique (Table 4.27).

Table 4.27

Comparing Means of Perception on Domain 5 Adjusting for Pre-test Score

Outcomes	Adjusted Mean ± SE		F	p-value
	PPT	IWB		
Student's Perception for using IWB in English Teaching and Learning	2.96 ± 0.06	3.28 ± 0.06	14.79	<0.0001*

* Significant p-value at 0.05
F = one-way ANCOVA

Overall perception of students comparing PowerPoint presentation and Interactive Whiteboard: Both PPT and IWB group showed a significant improved mean of overall perception of students. However the improvement was higher among IWB group. Although a small improvement was observed between pre-test and post-test, however the difference was significant (3.25 ± 0.33 vs. 3.34 ± 0.25, $t(73) = -2.20$, $p = 0.031$). The mean of overall student's perception significantly improved from 3.18 ± 0.33 to 3.48 ± 0.19 among IWB ($t(70) = -6.58$, $p < 0.0001$) (Table 4.28).

Table 4.28

Student's Perception on Technology Use among PPT and IWB Group

Group	Mean Score ± SD		t	df	p-value
	Pre-test	Post-test			
PowerPoint Presentation (PPT) (n=74)	3.25 ± 0.33	3.34 ± 0.25	-2.20	73	0.031*
Interactive Whiteboard (IWB) (n=71)	3.18 ± 0.33	3.48 ± 0.19	-6.58	70	<0.0001*

* Significant p-value at 0.05
t – paired t test

The equal variances were assumed for both the pre-test and post-test scores (p>0.05) for overall perception and each domain hence suitable for ANCOVA (APPENDIX B). Based on Table 4.29, there was a statistically significant difference in post-intervention perception score between the PPT and IWB groups when adjusted for pre-intervention score (3.26 ± 0.04 vs. 3.77 ± 0.04, $F = 12.584$, $p =$ 0.011). This indicates a clear positive transformation in perception towards technology usage in teaching and learning after IWB was introduced in the classroom.

Table 4.29

Comparing Means of Perception Adjusting for Post-test Score

Outcomes	Adjusted Mean ± SE		F	p-value
	PPT	IWB		
Student's Perception for using IWB in English Teaching and Learning	3.26 ± 0.04	3.77 ± 0.04	12.584	0.011*

* Significant p-value at 0.05
F = one-way ANCOVA

Changes in perception between male and female students after using Interactive Whiteboard: Based on the changes in mean between pre-test and post-test among IWB group, male students showed higher improvement in perception compared to female students in domain 1 (0.356 ± 0.089 vs. 0.233 ± 0.072). Similar trend was observed for domain 2 too (0.119 ± 0.055 vs. -0.095 ± 0.054). for domain 3, 4 and 5 male students showed a reduction in perception, while females showed improvement in perception (-0.021 ± 0.005 vs. 0.103 ± 0.005, -0.008 ± 0.007 vs. 0.077 ± 0.006 and -0.094 ± 0.007 vs. 0.064 ± 0.006 respectively). Generally, the overall perception in domain 1 was highly improved among male students compared to female students (2.188 ± 0.885 vs. 1.857 ±

175

0.702). However, the changes in perception between male and female student was not statistically significant. This mean, IWB was effective in both genders (Table 4.30).

Table 4.30

Comparing change in means of perception of students between male and female after using Interactive Whiteboard

| Perception | Gender | | *t* | p-value |
	Male Mean ± SD	Female Mean ± SD		
D1	0.356 ± 0.089	0.233 ± 0.072	0.689	0.493
D2	0.119 ± 0.055	-0.095 ± 0.054	1.680	0.097
D3	-0.021 ± 0.005	0.103 ± 0.005	-0.979	0.331
D4	-0.008 ± 0.007	0.077 ± 0.006	-0.529	0.598
D5	-0.094 ± 0.007	0.064 ± 0.006	-0.927	0.357
Overall	2.188 ± 0.885	1.857 ± 0.702	0.179	0.858

t – independent T-test
* Significant p-value at 0.05
D1 – Domain 1: Shortcomings on presentation with technology
D2 – Domain 2: Effectiveness of using technology to enhance presentation
D3 – Domain 3: Engaging presentation tool
D4 – Domain 4: Perception on effectual communication tool
D5 – Domain 5: Perception on student enthusiasm using technology

Changes in perception of students across ethnicity after using Interactive Whiteboard: Table 4.32 shows the changes in mean between pre-test and post-test among IWB group. In domain 1 the positive change in mean was highest among Indians and others, followed by Malays and Chinese (0.711 ± 0.240, 0.450 ± 0.167 and 0.406 ± 0.083 respectively). While in domain 2 the positive change in mean was highest for the Chinese students, followed by Indians and others and then Malays (0.206 ± 0.057, 0.178 ± 0.018 and 0.158 ± 0.119 respectively). The positive change in mean for domain 3 was the highest in the Chinese followed by Malays and Indians and others (0.181 ± 0.096, 0.188 ± 0.054 and 0.111 ± 0.060 respectively). In domain 4, only Malays showed

176

reduction in perception of mean score (-0.063 ± 0.011), while the Chinese improved positively followed by Indians and others (0.123 ± 0.060 and 0.083 ± 0.018).

The perception of students in domain 5 was slightly reduced after IWB was introduced to them in the classroom (- 0.056 ± 0.014 among Malays, -0.042 ± 0.006 among Chinese and - 0.204 ± 0.015 among Indians and others). Overall changes in perception among students in IWB was highest in Indians and others, followed by Chinese and Malays (4.833 ± 2.651, 4.291 ± 0.785 and 3.542 ± 1.650 respectively). The distribution of changes in mean perception in different domains and an overall perception of students between the ethnicity was not statistically significant. This indicates ethnicity do not influence the change in students perception. IWB was applicable in every student from different ethnicity (Table 4.31).

Table 4.31

Comparing change in means of perception of students between ethnicity after using Interactive Whiteboard

Perception	Ethnicity			F	p-value
	Malay Mean ± SD	Chinese Mean ± SD	Indians and others Mean ± SD		
D1	0.450 ± 0.167	0.406 ± 0.083	0.711 ± 0.240	0.963	0.384
D2	0.158 ± 0.119	0.206 ± 0.057	0.178 ± 0.018	0.067	0.935
D3	0.181 ± 0.096	0.188 ± 0.054	0.111 ± 0.060	0.152	0.859
D4	-0.063 ± 0.011	0.123 ± 0.060	0.083 ± 0.018	0.862	0.424
D5	- 0.056 ± 0.014	- 0.042 ± 0.006	- 0.204 ± 0.015	0.477	0.621
Overall	3.542 ± 1.650	4.291 ± 0.785	4.833 ± 2.651	0.128	0.880

F – One Way ANOVA

* Significant p-value at 0.05

D1 – Domain 1: Shortcomings on presentation with technology

D2 – Domain 2: Effectiveness of using technology to enhance presentation

D3 – Domain 3: Engaging presentation tool

D4 – Domain 4: Perception on effectual communication tool

D5 – Domain 5: Perception on student enthusiasm using technology

Changes in perception of students across English speaking proficiency after using the Interactive White Board:

Table 4.33 shows the changes in the mean score between pre-test and post-test among IWB group. Change in mean perception score was significantly higher among students with weak and fair English speaking proficiency compared to students with good and excellent for domain 1. This indicates that introducing IWB was more applicable as well as improved the shortcoming on presentation with technology especially among students with weak and fair English speaking proficiency.

Students with weak and fair English speaking proficiency showed greater improvement in perception in domain 2, 3 and 4 (0.432 ± 0.115, 0.368 ± 0.091 and 0.184 ± 0.104 respectively) compared to students with good and excellent English speaking proficiency (0.389 ± 0.087, 0.289 ± 0.077 and 0.120 ± 0.083 respectively). Mean score of perception in domain 5 reduced in both group of students (- 0.105 ± 0.131 and. - 0.135 ± 0.077). However, the differences in mean score for perception between English speaking proficiency especially in domain 2, 3 and 4 were not statistically significant ($p > 0.05$). This indicates that English speaking proficiency do not influence the students' perception for domain 2, 3 and 4.

The mean score of perception for domain 5 showed a non-significant negative change ($p > 0.005$). However, the change was smaller among student with weak and fair English speaking proficiency (- 0.105 ± 0.131 vs. - 0.135 ± 0.077). The overall change in score in students' perception was higher among student with weak and fair English speaking proficiency. However, the observed difference between these two groups of student was at borderline line level. This indicates that there might be other factors

simultaneously influenced the students' perception despite the English speaking proficiency (Table 4.32).

Table 4.32

Comparing change in means of perception of students between English speaking proficiency after using Interactive Whiteboard

| Perception | English speaking proficiency | | *T* | p-value |
	Weak & Fair Mean ± SD	Good & Excellent Mean ± SD		
D1	1.032 ± 0.141	0.473 ± 0.137	2.304	0.024*
D2	0.432 ± 0.115	0.389 ± 0.087	0.271	0.787
D3	0.368 ± 0.091	0.289 ± 0.077	0.577	0.566
D4	0.184 ± 0.104	0.120 ± 0.083	0.424	0.673
D5	- 0.105 ± 0.131	- 0.135 ± 0.077	0.196	0.846
Overall	9.684 ± 1.489	5.423 ± 1.218	1.928	0.058

t – independent T-test
* Significant p-value at 0.05
D1 – Domain 1: Shortcomings on presentation with technology
D2 – Domain 2: Effectiveness of using technology to enhance presentation
D3 – Domain 3: Engaging presentation tool
D4 – Domain 4: Perception on effectual communication tool
D5 – Domain 5: Perception on student enthusiasm using technology

Changes in perception of students in English written proficiency after using Interactive White Board: Based on the changes in the mean score between pre-test and post-test among IWB group, students with good and excellent English written proficiency showed higher improvement in perception for domain 1 (0.704 ± 0.133 vs. 0.452 ± 0.198). After IWB was introduced in class, students with weak and fair English written proficiency showed improvement in perception in domain 2, 3 and 4 (0.504 ± 0.091 vs. 0.350 ± 0.093, 0.391 ± 0.104 vs.0.271 ± 0.075 and 0.196 ± 0.079 vs. 0.109 ± 0.091 respectively). However, students the change in mean score of perception for domain 5 was negative. The negative change was more among students with good and excellent

English written proficiency compared to those with weak and fair English written proficiency (- 0.146 ± 0.082 vs. - 0.087 ± 0.011).

The overall change in students' perception score was higher among students with weak and fair English written proficiency (6.696 ± 1.838 vs. 6.500 ± 1.197). However, this study found the overall changes in students' perception as well as across the domain between English written proficiency were not significant different. This indicates that, English written proficiency of students do not influence students' perception after IWB was introduced in class room (Table 4.33).

Table 4.33

Comparing change in means of perception of students between English written proficiency after using Interactive Whiteboard

| Perception | English written proficiency | | T | p-value |
	Weak & Fair Mean ± SD	Good & Excellent Mean ± SD		
D1	0.452 ± 0.198	0.704 ± 0.133	- 1.068	0.289
D2	0.504 ± 0.091	0.350 ± 0.093	1.031	0.306
D3	0.391 ± 0.104	0.271 ± 0.075	0.923	0.359
D4	0.196 ± 0.079	0.109 ± 0.091	0.604	0.548
D5	- 0.087 ± 0.011	- 0.146 ± 0.082	0.415	0.679
Overall	6.696 ± 1.838	6.500 ± 1.197	0.091	0.928

t – independent t-test
* Significant p-value at 0.05
D1 – Domain 1: Shortcomings on presentation with technology
D2 – Domain 2: Effectiveness of using technology to enhance presentation
D3 – Domain 3: Engaging presentation tool
D4 – Domain 4: Perception on effectual communication tool
D5 – Domain 5: Perception on student enthusiasm using technology

In conclusion, the introduction of IWB as a presentation tool was efficiently applicable among all students and not influenced by gender, ethnicity as well as for English speaking and written proficiency. However, IWB was more efficient in improving the shortcomings on presentation in classroom. On the other hand, students'

180

enthusiasm using technology in the classroom did not improve even after IWB was introduced.

Difference in Performance among Students Using PowerPoint Slides and Interactive White Board

T-test is an inferential statistical test that determines whether there is a statistically significant difference between the means in two groups (PPT vs. IWB). In our study, a significant higher oral examination score was found among students in IWB group compared to PPT group (19.18 ± 1.53 vs. 18.57 ± 1.89; $t(144) = 2.154$, $p = 0.033$) (Table 4.34).

Table 4.34

Student's oral performance between PPT and IWB Group

Variables	Mean ± SD	t [a]	Df	p-value
PowerPoint Presentation (PPT)	18.57 ± 1.89	2.154	144	0.033*
Interactive Whiteboard (IWB)	19.18 ± 1.53			

[a] Independent t-test
* Significant p-value at 0.05

Multivariate Analysis for Perception of Students on Technology Used Among PowerPoint Presentation and Interactive Whiteboard Group

In order to evaluate the differences in the mean score of students' perception between time (pre-test and post-test) and between two groups (IWB vs. PPT), split-time ANOVA (SPANOVA) was applied. Table 4.35 shows the descriptive statistics of students' perception between pre-test and post-test across the time.

Table 4.35:

Mean and standard deviation of students' perception at pre-test and post-test

Test	Group	Mean	SD
Pre-test	IWB	3.18	0.33
	PPT	3.25	0.33
Post-test	IWB	3.48	0.25
	PPT	3.34	0.25

According to the SPANOVA test, the usage of the Interactive White Board (IWB) is effective in increasing the overall score of students' perception ($F_{(1,143)} = 11.48$, $p = 0.001$). In addition, the results indicate a significant increase in the post-test score of student perception in both groups in relation to their pretest scores ($F_{(1,143)} = 40.43$, $p < 0.001$) The main effect of comparing these two types of technology was not significant ($F_{(1,143)} = 1.442$, $p = 0.232$), concluding that only IWB group revealed an increase in the effectiveness of students' perception (Table 4.36).

Table 4.36

Summary of results of SPANOVA results of overall Students' Perception

Source	Mean square	Df	F^a	p-value	η^2
Test (Pre-post)	2.745	1	40.43	<0.001*	0.220
Group (IWB – PPT)	0.126	1	1.442	0.232	0.010
Test * Group	0.780	1	11.48	0.001*	0.074

Bonferroni test revealed that the students' perception between IWB and PPT group in pre-test was not statistically significant (p= 0.256) while the differences in students' perception between IWB and PPT for the post-test was significant (p< 0.001). The effect size of the difference in post-test between IWB and PPT was low ($\eta^2 = 0.099$) (Table 4.37).

Table 4.37:

Mean comparison of students' perception between groups across the time

Test	Groups	MD	SE	P value	95% CI Lower Bound	95% CI Upper Bound	η^2
Pre-test	IWB vs PPT	-0.062	0.054	0.256	- 0.169	0.045	0.009
Post-test	IWB vs PPT	0.145	0.037	<0.001	0.073	0.218	0.099

Bonferroni test revealed that the students' perception between pre-test and post-test in IWB group was statistically significant (p < 0.001). Similarly, the differences in students' perception between pre-test and post-test in PPT group was significant (p = 0.031). However, the IWB group had a higher difference in effect size compared to PPT (η^2: 0.246 vs. 0.031) (Table 4.38).

Table 4.38:

Mean comparison of students' perception across the time for each group

Group	Time	MD	SE	P value	95% CI Lower Bound	95% CI Upper Bound	η^2
IWB	Pre vs Post	-0.298	0.044	<0.001*	-0.385	-0.212	0.246
PPT	Pre vs Post	-0.091	0.043	0.031	-0.176	-0.006	0.031

Figure 4.16 reveal the mean plot of students' perception mean score in IWB and PPT group across the pre-test and post-test. Both IWB and PPT showed increased in score after the intervention; however, the IWB group revealed a higher change in mean score compared to PPT group across the time.

183
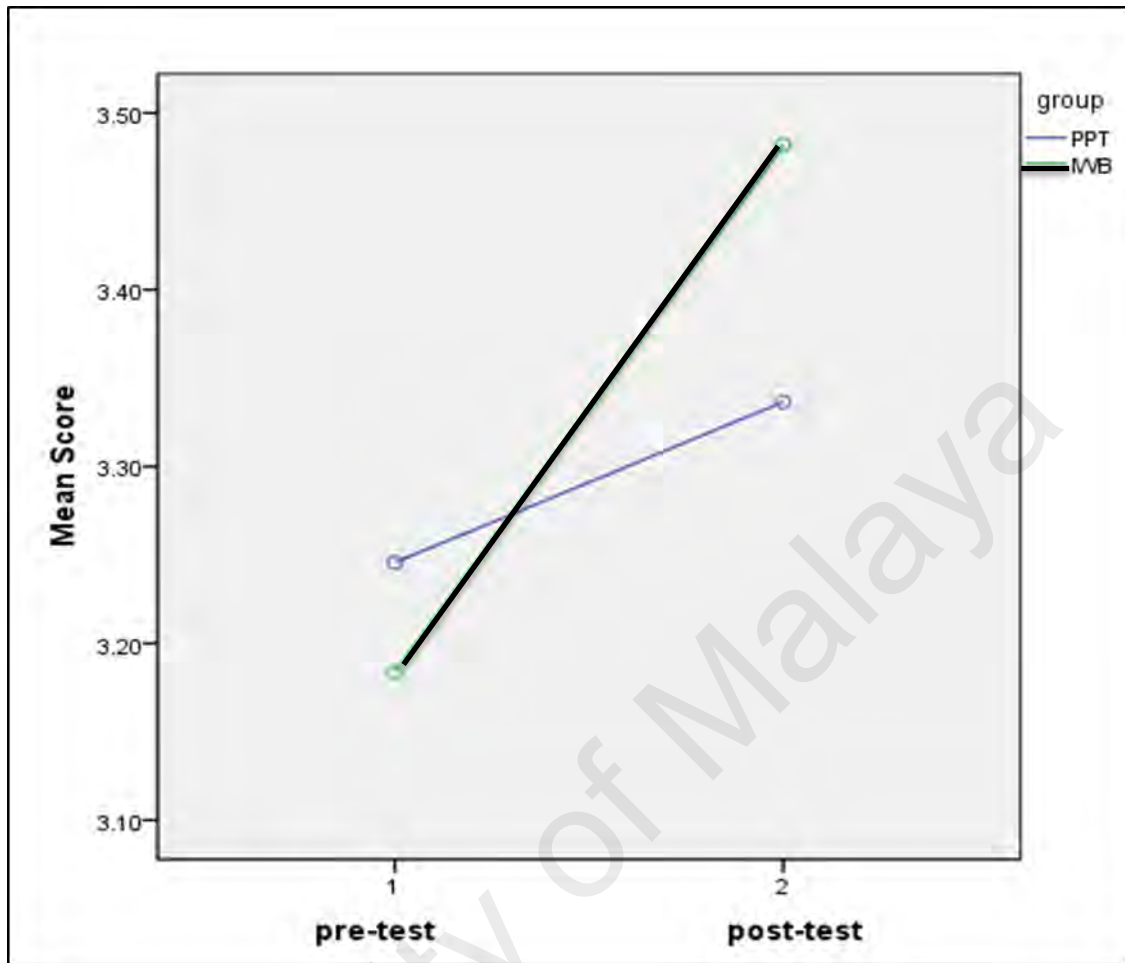
Figure 4.16: Mean plot students' perception mean score in IWB and PPT group across the pre-test and post-test

Interview

Following the survey, a group of ten foundation students who had used the Interactive White Board for presentation had volunteered to be interviewed for the summative evaluation. In this section, the eighth question is discussed directly:

"What are the opinions of the students using this module with the interactive whiteboard in a language classroom?"

The findings were divided into three different sections. The first section is information design, which includes the objectives and learning outcomes, content and learning materials, language and exercise or activities. The second section focuses on

interaction design, which is related to interaction features like notes, activities and final assignment. The third section involves the presentation design which focuses on slide design, background color, font and graphics and the final section centers on learning theories.

Opinions of students using the module with Interactive Whiteboard for presentation:

Objectives and learning outcomes: Based on the information obtained from the findings from the interview students, the objectives and the learning outcomes were clearly written, easily understood and suitable for foundation students. Two students agreed that the objectives and learning outcomes helped them to focus on the topics covered in this module.

> *Objectives and learning outcomes were suitable and it helpful in order to explore the module.* (KLN,S1 ,66-67).

Content and learning materials: In addition to that, all students agreed that the content was clear, easily understood and interesting. One of the students mentioned that the content was engaging and helped her to understand the content better. On the other hand, the students also mentioned that the instructions given were simple and easily understood because the language used in this module were simple and direct.

> *Yes, after the project, we are able to learn more about the usage presentation skills, and all the knowledge we learnt in class. Thus, it is clear that the interactive board can improve the presentation* (SLA,S3,60-62)

> *I find it easy to follow as the instructions were clear and simple.* (KKS, S4 .62)

Activities: Based on the feedback received from the students, the activities in this module were interesting, challenging and also fun. All the ten of them agreed that the

185

selection of activities given in the module were useful and the interactive tools available on the Interactive White Board are made the presentation more engaging. One of them mentioned that he liked using the colorful pen to highlight certain ideas during the presentation Another student suggested adding more activities because it is fun to conduct a presentation using this form of technology.

> *I like the zoom in and out feature and I'm able to circle and point out the key points and navigate with simple clicks. It can help us to highlight the points that I want people to notice, in addition that I can zoom in and out when doing the presentation.* (SLA, S3, 118-120).

> *I think it's a good tool for students to convey their presentations in a more interactive way rather than just spoken words.* (KKS, S4, 119-120).

Navigation: Based on the feedback received from the students, most of the students mentioned that they did not have any difficulties with the navigation or scrolling of slides. Instead, they found it easy and straightforward. In addition to that, one of the students mentioned that in order to go forward one needs to tap the screen from left to right and otherwise to go backward. On the whole, the navigations were easy and user-friendly**.**

> *The navigations were direct and simple and I was able to navigate and explore the module with ease.* (KKS, S4, 133-134).

Based on the feedback received from the students, most of the students mentioned that they did not have any difficulties with the navigations. On the whole, the navigations were easy and user- friendly. However, two of them had some difficulties navigating the tools.

> *In my opinion, the Interactive White Board should improve their software quality. The user interface, the navigation panel can be improved as it is not easy to use. Many people found it confusing.* (SLA, S3, 163-165).

I did experience some difficulties when using the Interactive White Board for my project presentation. The tools of the Interactive White Board were a bit not user-friendly, especially in terms of their navigation. (VEN, S6, 145-147).

Feedbacks obtained from the students were very positive because all the students agreed that content of the module had related materials to enable them to become better and confident presenters. Apart from that, one of the students mentioned that it was an interesting way to acquire presentation skills with this module using the Interactive Module especially the content was straightforward and the sample videos given in the module had helped them prepare better for their final graded presentation.

> *The module is easy to use and it encourages interactive presentation as it allows the presenter to interact with audience and details on the board with the help of tools like zooms in, highlighters and others. I got to know how to use Interactive White Board and improve the way I prepared my presentation for the final assignment.* (KKS, S4, 164-166)

Final presentation assignment: It was revealed that the final assignment was exciting, interesting and challenging too. This assignment encourages hands-on learning and it is also interactive and engaging. It contained related requirements to guide students with the preparation of the final presentation and it contains a rubric that will be used for the assessment of the final presentation. On the whole, the assignment allows for creative and new presentation approach because it helps the students to engage with the audience better. One of the students had mentioned that presentation supports greater collaboration among the audience with the usage of Interactive White Board.

> *It's a new and a creative way that gives a positive outcome to our usual presentation as it can capture the audience's attention.* (KLN, S1, 104-105)

> *It helps a lot as compared to PowerPoint slides where we can only move to the next slide, and not making any interaction with the slides to have a deeper*

understanding of it. On the other hand, IWB allows one to explain more about a particular topic when using it as we can elaborate and write on the slide on the spot. (SLA, S3, 122 – 125).

The assignment question is clear and it contains the requirements to be included in the presentation. In addition, a rubric is attached to enable the presenter to produce a better presentation as stated in the question. (FNT,S5, 180-182)

Figure 4.17: *Snapshot of student's final presentation using IWB*

Figure 4.18: *Snapshot of student's final presentation using IWB with a video recording.*

Learning Theories

Expert's perspective: Based on the feedback obtained from both the experts, it is revealed that the module supports active learning and at the same time promotes collaborative learning as students interact directly with the audience in an engaging manner during the presentation and work as a team to complete the activities and given an assignment. Both experts agreed that these students are able to relate to their prior knowledge of presentation skills and connect them with the new knowledge gained from this presentation module.

Moreover, both of them had mentioned that the module enables them to produce a better presentation. One of the experts had mentioned that the module supports holistic

and experiential learning approach that had helped achieve the intended learning outcome of the module.

On the whole, both experts came to a conclusion that the module integrating the Interactive White Board to promote interactive presentation is able to increase student's motivation and attract student's attention while conducting a presentation.

Good start. This module supports holistic and experiential learning and achieved the desired learning outcome. (LYS, TE1, 112 -113)

In conclusion, both the experts have mentioned that the module enables learners to explore new avenues to conduct interactive presentation by integrating new digital tools. One of the experts had mentioned that this type of verbal presentation approach enables learners to express their ideas better and shown more enthusiasm during their presentations. Therefore, these foundation students have become active and intentional learners.

Yes, this module allows for a positive outlook. These students are able to express their ideas better and are enthusiastic about their verbal presentations. Hence, it will make them become active and intentional learners. (LYS, TE1, 158 -159)

Subject Matter Expert's point of view: Based on the interview findings, all three experts have indicated that these students were able to relate their prior knowledge on presentation skills with the newly gained knowledge on interactive presentation. One of the content experts had further mentioned that these students have shown their ability to come up with an interactive presentation with ease.

It is not difficult for them to acquire the knowledge on the usage of the Interactive White Board. (RIS,SME 2,137 -138)

In addition, all the experts have collectively agreed that this module supports active learning and all activities and assignments have enabled these foundation students to produce a better presentation.

Two of the experts have suggested that with additional training, these students are able to explore more tools available on the Interactive White Board.

> *Yes, but more practice is needed to explore the usage of the tools.*
> (PER,SME 3, 139).

In terms of navigation of module, all three experts have highlighted that it was easy to view the module and acquire the newly gained knowledge on interactive presentation in a flexible manner. Furthermore, they had mentioned that the type of activities and assignment prepared to support this new interactive presentation approach.

> *Yes, these activities are more hands-on and it allows interaction with the slides using the interactive White Board for presentation.* (RIS,SME 2,154-155)

> *One of the experts had commented that the assignment question was related to their profession. Therefore, selected assignment question is more relevant to their programme. It is designed to cater to the needs of their profession.* (RIS,SME 2, ,161)

Next, in terms of integration of presentation skills among foundation students across various modules taught in the foundation programme, findings from the interview have revealed that all three experts have stated that the final presentation is an integrated presentation for three respective modules taught in the foundation programme as indicated in the assignment brief that was given to the students.

> *The type of assignment is an integrated project for these students as it combines three modules in one learning platform with the aim of achieving the intended learning outcomes.* (PER,SME 3,188-189).

On the whole, all three language lecturers have stated that the presentation module that promotes interactive presentation through the use of the Interactive White Board is appropriate as it enhances the teaching and learning approach especially making the presentation more focused and interactive. One of the experts had commented that this teaching approach allows the students to become a more confident and an articulate presenter with an engaging presentation as the Interactive White Board allows the presenter to interact with the slides and capture the audience's attention during the presentation.

> *Yes, especially teaching. To teach speaking because students need to be confident and articulate themselves and Interactive White Board stimulate their interactive and engaging presentation.* (RIS,SME 2, 202-204)

In terms of advantages, all three experts have agreed that the module promotes interactive presentation which supports collaborative learning and at the same time making their presentation more attractive and engaging. On the contrary, the three experts have suggested that these students need to work more training to fully utilize the presentation tools available on the Interactive White Board.

> *I think students need to be more familiar with the presentation tools, especially the features.* (PER,SME 3, 224).

The overall impression that was concluded at the end of the interview by the three experts was that the module and their final presentation enabled these foundation students to showcase their creativity by coming up with an impressive presentation. Additionally, all three experts have mentioned that students were at ease using the Interactive White Board during the final presentation which allows for more participation among the

audience and the presenter. The interactive presentation is quite impressive because it helps students and audience focus on keywords or on important topics.

In short, it helps both parties focus on the presentation flow. Such interactive presentation is a good tool to engage with the audience. (PER, SME , 230 -231).

Student's perspective: Based on the interview findings, all the students have mentioned that the contents of the module have helped them to become a better presenter. Most of them agreed that the text and images were relevant in the module. In addition to that, the instructions included in the module were simple and easily understood. On the whole, all of them indicated that the presentation module using interactive module have provided them with a new platform to convey their presentation task which is more engaging and enables the audience to pay extra attention during the presentation.

I can understand the module without many difficulties and it allows me to view presentation skills from a different point of view. (KLN, S1, 63-64)

Yes, it is to enables a student to have a full understanding of an interactive presentation. It can improve student's response and ability to present in an interactive manner. Thus, it helps a student to engage with the syllabus better. Furthermore, the integration of different modules in this particular topic is interesting too."
(SLA, S3, 52-55.)

Moreover, all respondents agreed that the presentation module using the Interactive White Board supports active learning as they feel that they are given more control to direct their own learning. Most of the students have mentioned that the module and the tool which is the Interactive White Board facilitates the learning process of presentation skills and allows them to engage, understand the presentation concepts better and apply the new knowledge gained in their activities given in the module and the for their final assignment. Therefore, most of the students agreed that it supports the

exploration of ideas through interactive presentation and relate their prior knowledge on presentation skills with the newly gained knowledge.

> *Interactive White Board as a presentation tool is useful for students to release presentation nervousness and can also be interacting with lecture slides like writing or drawing notes on the Interactive White Board to make the presentation interesting and encourages teamwork at the same time.* (FNT, S5 176-178)

Based on the feedback obtained from the students, all of them mentioned that the slides designs were appropriate. They all agreed that it was very attractive and captivating. Apart from that, most of the students suggested using colored background. They felt that it might make the module more attractive and appealing. Furthermore, according to the student's response, it was found that type and size were clear, suitable and easy to read. The graphics and clipart used were attractive, colorful and catchy.

Two students agreed that it was relevant to the topic. Therefore, this assignment was carried out without much distraction. In conclusion, most of the respondents were optimistic about using the Interactive White Board for their presentations as they felt it will enable them to come up with more engaging presentations.

> *If given another chance, assignments using IWB, I will make the presentation notes with certain keywords then explain by writing or drawing on the IWB. These were the tools that were commonly used to make my presentation more interactive. Undo, Next, Revises, Clear, Erase, Drawing – Colour Selection.* (FNT,S5, 178-180).

> *Pretty interesting! I would use the Interactive White Board to engage more with the audience.* (RPS,S8, 158-159).

Figure 4.19: *Snapshot of student's final presentation using IWB.*

All students agreed that the final presentation was an integrated module for three mentioned modules in the assignment question and the skills acquired can be applied across various modules.
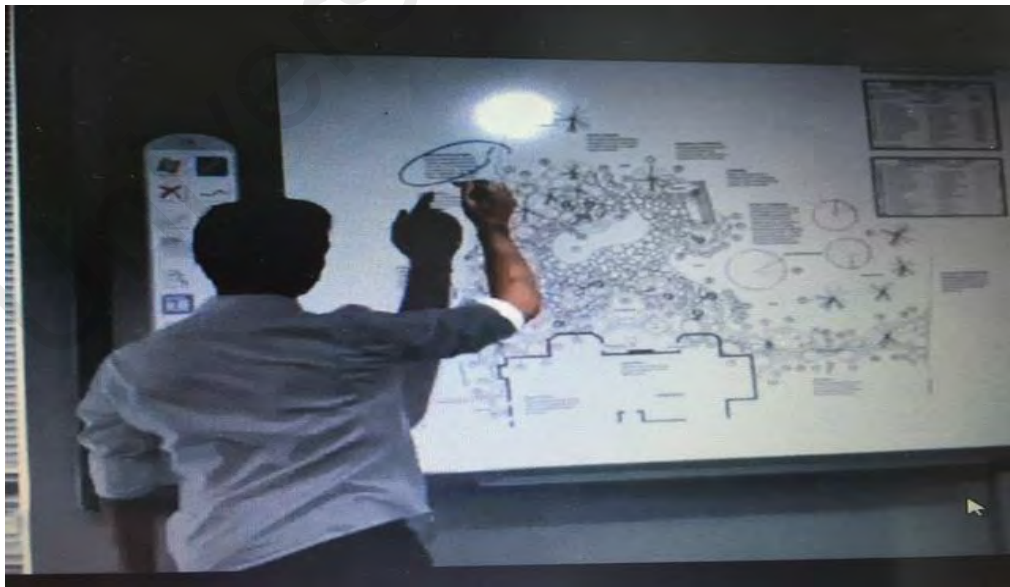

Figure 4.20: *Snapshot of student's final presentation using IWB.*

I would use the Interactive White Board to explain my topic better by highlighting or circling important points and to communicate better with my audience and it can be used for any presentations across various modules. (CLE, S9, 189 -192).

Overall several students have suggested that a few technical aspects need to be looked into for improvement. A few suggestions are to improve the sensitivity of the pen and make the software more user-friendly for all computers as it was not compatible with certain computers.

The sensitivity of the pen needs to be better. (KKS, S4, 179)

Make it user-friendly for all types of computers. (CLE,S9, 203).

Conclusion

Generally, the feedback obtained from both the experts and students regarding this module were positive and favorable. Nevertheless, the opinion obtained from the experts and students were used to make changes on the module in order to enhance its features. In conclusion, the hypotheses 3 (H3) is accepted.

CHAPTER 5 DISCUSSION AND CONCLUSION

Introduction

The aim of this study was to obtain the view of the experts and the students on the presentation module using the Interactive Whiteboard, which was designed by the researcher. This was done to ascertain the appropriateness, suitability as well as to view the shortcomings of the module. Hence, the feedback received from the experts and the students were given due consideration to allow this module to be carried out in a private higher learning institution.

This study has provided evidence that presentation using the Interactive White Board could be used effectively to promote interactive presentation in a foundation classroom at a private higher learning institution in the Klang Valley. A development research (DDR – Type 1) method was used for the module. The research question in the needs analysis phase reported on the academicians and students viewpoint on the usage of technology, next, the design and development phases, focused on the opinions obtained from the experts during the formative evaluation stage which was used to enhance the design module.

The final phase was centered on student's perception on the usage of the module to produce an interactive presentation using the Interactive White Board and a comparison of students achievement of their oral presentation scores between the two groups namely the control group that used (Power Point Slides) for their presentation with the experimental group that had used (Interactive White Board) as their presentation tool to promote interactive presentation.

During the initial phase which is the needs analyses phase, perception of the Programme Director, and another lecturer were obtained through an interview and a

survey done by two groups of students was obtained to decide on the teaching and learning method of the module. The findings of the module were used to design an interactive presentation module using the Interactive White Board.

For the second phase, which is the design and development phase, a module on presentation skills using the Interactive White Board was developed. A group of five experts was involved in the designing phase of the module. They consisted of two educational technologist and three subject matter experts. This module was designed based on Kristof and Satran's (1995) study which include information design, interaction design and presentation design. The learning environment used was a social constructivist method and the Interactive White Board was used for the delivery of the learning material.

In the third phase, the implementation and evaluation of the appropriateness of the module were done. The respondents were 145 students from the foundation programme. Data was collected from a pre-test and a post-test survey from two different groups namely 71 from the controlled group and 74 students from the experiment group and interview with 10 students who had volunteered from the experimental group and were analysed. These students' opinions on the usage of the module in teaching and learning of English in particular to produce an interactive presentation were analysed.

Additionally, these respondents said that this module is suitable and could be used in an English classroom especially for presentation purposes. A majority of the respondents did not have difficulties using the module. In contrast, a small number of students have mentioned that they need more technical support and training to use the tools available on the Interactive White Board.

On the whole, the participants felt that the presentation module using the Interactive White Board was effective. These participants were able to produce a better presentation. Furthermore, the participants were motivated in using the module to produce an interactive presentation module as they were able to make their presentations more attractive. Based on the findings, it is recommended that the Oral Presentation module using the Interactive White Board can be used for the learning of English and integration of the Interactive White Board as a presentation tool may also be introduced for instruction and learning in other subjects. In addition to that, there was also a significant difference in the scores of the oral presentation marks between these two groups of students.

Hence, it can be concluded that using Interactive White Board not only promotes engaging and interactive learning approaches but it also improves students' performance too. Refer to (Table 4.35). The discussion is in the following areas: the development research process, the design task and learning tool.

The Development of Research Process

Phase 1 Needs Analysis

In this section "respondents" were referred to both the experts as well as the students. In this study, ADDIE's model of instructional design which consists of the Analyses, Design, Development, Implement and Evaluation phase was used in developing and designing this module using the Interactive Whiteboard. The approached adapted in this study was based on the development of research method as suggested by (Ritchey, 1997; Wang & Hanafin, 2005). The model was utilized in the development process of the module established on needs derived from the lecturers and students point of view in the situation of this study. A similar method was used by Morze, Kuzminska

& Liakh (2017) where the experience of implementation distance learning course for the teachers of the postgraduate studies were described which focused on course on development of educational, scientific collaboration and project management with ICT tools in universities

The findings from the needs analyses process were used as suggestions for the design of the module. As mentioned in chapter 4, both the Programme Director and lecturer agreed that the Interactive White Board is an essential tool for presentation. Additionally, (refer to Table 4.5) which had highlighted that a majority of students felt that acquiring the knowledge on the usage of IWB benefits them in terms of presentation. Similarly, Morze, Kuzminska & Liakh (2017) used ICT tool to increase the level of ICT-competence among students and teachers. The needs analyses process was conducted as mentioned by Rossett (1995) that this phase involves getting information of the situation and the surrounding of the learning environment.

In this study, the design model analyses the subject, the characteristics of the learners and the learning objectives. Furthermore, the teaching activities and the resources were given due consideration and evaluation was incorporated from the beginning of the development stage until the completion stage with chances for revision at any point of time. Hence, it allows for improvement and ultimately producing a module with better features. This finding concurs with Zwarenstein, Goldman & Reeves (2009) that highlighted the constant evaluation and revision of technology integrated inter-professional education method or tool was linked with competence. Apart from that, this study would inspire the lecturers to develop and design a module using Interactive Whiteboard to be used in their respective classrooms because it supports changes at any point of time (Day, van Blankenstein, Westenberg & Admiraal, 2018).

The module using Interactive Whiteboard was developed using Multi-Touch Board Diver, Multi-Touch Board and Multi-Touch Lite-Board software. The learning tool is simple and easy to handle and the feedback received from the needs analysis revealed that the Programme Director and the foundation lecturer found that Interactive White Board is a suitable tool to be introduced in a classroom to support interactive presentation as the software is easily learnt. The outcome of this study concurs with several studies that report a similar output with the usage of IWB, where the teachers consistently reported more possibilities to differentiate learning more easily and sharing information with the use of IWB (Moats, 2015; Montrieux, Vanderlinde, Schellens & De Marez, 2015; Levine & Murnen, 2009). Hence, this study will further boost more lecturers to develop their own module using the Interactive White Board interactively to engage in their respective classrooms.

Formative evaluation and summative evaluation were conducted during the development and designing of the module using the Interactive Whiteboard. The formative evaluation involves the experts opinions because they were relevant in order to produce an appropriate learning material for the targeted learners. The outcome of this phase of the study was supported with the statement by Dick and Carey (1990) which highlighted the formative evaluation as a process to gather data and help upgrade the instruction in order to produce a more efficient learning material. Expert's contribution will enhance the content, usage of accurate theoretical framework and able identify missing information for a better understanding on the acceptance of technology (Moats, 2015).

The summative evaluation involves the students or the target learners to answer the research question on the effectiveness of the module. This was done to evaluate the

learning material because their feedback was needed to further furbish this module in order to be carried out in a classroom. This phase of the study, concurs with Bhola, (1990) who suggested that summative evaluation ensures the achievement of minimum standards of knowledge, skills and attitudes among the intended learners.(Refer to Table 4.36).

In this study, the target learners were foundation students from a private higher learning institution. The needs analysis revealed that the present learning environment is less interactive and less engaging. In addition, using the Interactive White Board as a presentation tool enables these foundation students to save space as it does not require a specific area to place their mounting boards since the presentation is done using the Interactive White Board. Therefore, a module using Interactive Whiteboard was developed to support a more interactive and engaging environment in a classroom and to overcome the shortage of space in the institution. This finding was consistent with Hockly (2013), who mentions that students who use the Interactive White Board enhance the motivation level and engagement among them. Similar finding was reported by Dhindsa (2011) where the usage of Technology-Rich Whiteboard efficiently improved the space usage in the classroom as well as improved time management and rate of participation in the class.

Furthermore, another finding identified by the Programme Director that during the needs assessment there was a need to diversify the delivery of a lesson. This finding corresponded with Termit Kaur & Abdul Rashid (2012) who states that students were more attentive and motivated when lessons were offered using the board rather than using traditional teaching method.. On the whole, the main outcome of this phase is to encourage more educators to use the Interactive White Board in classrooms as educators

202

are unwilling or have negative perception on integrating technology in classroom as highlighted by Kopca (2012). In addition to that, the Programme Director had also suggested conducting training for lecturers to encourage the usage of Interactive White Board in classroom. This finding corresponds with Harish, Misra &Kohler (2009) who have mentioned that there is lack of formal training on technology integration in classrooms that deters educators to incorporate the usage of technology in classrooms.

Phase 2 Design and Development: Information Design

This module was designed based on Kristof and Satran's (1995) study which include information design, interaction design and presentation design. For information design, the respondents revealed that the objectives and learning outcomes were clearly stated. The distinctly written objectives and learning outcomes have enabled the target learners to recognize the scope of this module and also help them to stay focused to achieve the intended learning outcome at the end of the module. This finding concurs with Tremblay, Lalancette & Roseveare (2012) on module development process. Notes on presentation skill were included in this module, where information was provided with a combination of text and images for better visualization (Chun, Kern & Smith, 2016). Several video presentation links and a sample video link on a presentation using the Interactive White Board were included to further enhance student's understanding (Morze, Kuzminska & Laikh, 2017). The pictures and graphics were inserted in order to capture attentions as well as to accommodate for diverse learning approaches (Dierks et al, 2014).

The respondents from present study agreed with the contents, structure and curriculum need of the module. The instructions in the module was identified as direct and easily understood. Other the other hand, the activities and in particular and the final

assignment was in agreement with the student's field of study and supported various modalities of learning like sight, touch and sound (Refer to expert's opinion from chapter 4). This finding from this study is consistent with the statement by Beeland (2002); those who conducted a study on the engagement level of middle school students were encouraged to use visual, auditory, and tactile as modalities of teaching. This strategy with integration of IWB was identified successfully increased student commitment in the lessons. His added that integrating Interactive Whiteboards had intensified student's involvement and motivation owing to its presence of the three learning modalities, particularly to visual learning approach. Additionally, Chandler (2005); Jones & Tanner, (2002) suggested that a lesson using the Interactive White Board allows for two-way communication between the teachers and students by inducing the use of their hands and minds. It is hypothesized that these strategies will encourage exploration as well as promotes inquiry-oriented learning (Moats, 2015).

Furthermore, the respondents have identified that the content was well organized chunked accordingly. This is in line with Shaumbaugh, & Magliaro (1997) who suggested that the information provided to the learners begins with a simple concept and moves towards a more complex one. Thus, the flow of information facilitates learning and reduces disruptions among learners (Moats, 2015).

The respondents agreed that the language used in this module was simple and easy to understand. Besides that, on the whole the respondents agreed that the activities in the module were to be interesting and challenging. As a result, this engaging learning activity enabled the learners to explore this module better. This finding was consistent with Termit Kaur & Abdul Rashid (2012); Türel (2011) and Chandler (2005), who mentioned that an engaging multimedia material using the Interactive Whiteboard helps

students to comprehend the lesson on presentation skills better as it caters for different learning styles.

Interaction Design

The respondents agreed that they have no issues with page navigations as it involved touching the screen and also the arrow keys on the menu bar. Hence, the respondents did not have any disruptions during the navigation, which further encouraged them to explore the module with full motivation. All the respondents agreed that the features included in the module using the Interactive Whiteboard were relevant and interesting. The students agreed that the Notes, example page and the activities were very helpful and able to encourage further exploring in this module (Refer to Navigation from chapter 4).The module met the specifications as suggest by Shaumbaugh & Magliaro (1997) where an effective educational module should be comprehensible to the learners, helpful in learning, enable teachers and students to draw relationships between the concepts and able to deliver the content efficiently.

Presentation Design

Most of the respondents state that the screen layout was simple and appealing. There were differences in opinion with regards to the background color of the module between the experts and the students. Most of the experts suggested using white color as the background colour for the module; where else the students suggested using coloured background. For the purpose of clarity, changes were made to the Example page and Activity page, which were originally coloured to white. All the respondents agreed with the font size used. They all agreed that it was clear and easy to read. Graphics and

pictures were inserted to attract the students' attention. All the respondents commented that the selected graphics and pictures were clear (Refer to Presentation Design from chapter 4).

Every aspect in the presentation was modified in detail as experts suggested that the successful presentation is not only about a perfect content and presenting skills (Lai, 2015). And when it comes to retention, according to a study made by Weiss and McGarth (2001), 100% increase in retention can be observed with visual presentations and a 600% increase with audiovisual inputs as compared to auditory stimuli alone. This is in line with the fundamental concept that in a good presentation, the audience needs to understand the message of the presentation with the least effort possible (Shedroff, 1999).

Design of task based on social constructivist learning approach: The design of the Interactive presentation module is based on Gagne's Learning Nine Event. This is in line the concept suggested by the Gagne's Learning Event where the instruction that was used to deliver the teaching materials during the lesson must enables instructors to organize and keep track of students' progress. Furthermore, each step can function as a checklist before the delivery of a lesson (CITT, 2016).

Constructivist learning theories which was adapted in this present module specify the target learner who keenly contributes to the learning process by getting involved in meaningful experiences. The concept was consistent with Beeland (2002) who promotes the idea that the Interactive Whiteboard is an effectual communication tool for students despite their ease of access from computers. Furthermore, Marzano (2009) highlighted that there was a rise in student accomplishment particularly in student feedback, usage of graphics to signify information and strengthen accurate answers.

Connecting a learner's prior knowledge with newly gained knowledge is a common characteristic in an active learning environment. Alexiou-Ray, Wilson, Wright & Peirano (2003) mentioned that Interactive Whiteboards "emphasized a more constructivist approach in which students are actively learning with "real world" implications" (p. 73).Moreover, constructivist instructional design highlights teamwork and student-centered learning while ascribing individual concern for understanding information.

The module was design in concordance to concept that learning with Interactive Whiteboards in a classroom concedes for improved student retention and finally increases performances in terms of presentation skills among learners. (Refer to Table 4.35). The Interactive Whiteboard was design to play a vital role in communication and discussion of ideas as a new approach for a class presentation (Ayetec, 2013). Piaget's theory was selected in this module design process due to certain strengths which includes encouragement of active participation, a requirement for social interaction, individual's capability to acquire and to adjust to innovative skills or knowledge and support thinking creatively (Webb, 1980).

In this study, the foundation students successfully conduct a presentation using the Interactive White Board and the teacher becomes a guide who assists students in knowledge building through various activities such as dialogue, questioning, guided learning activities, and discussion. The foundation students benefit this activity as they were introduced to presentation skills during the lecture and several rounds of presentation have taken place during the tutorial.

These students successfully do a presentation using the Interactive Whiteboard based on the presentation task given to them after introduced with two training session using IWB software. This showed that the usage of IWB as a medium of instruction by

using presentation tools able to promote the interactive whiteboard software an indirectly enhance learning materials as it enables a teacher to get their students to be able to schematize new concepts and improve their presentation skills (Becta Publication, 2006). This is in line with the information gathered from the content expert during need analysis (Refer to benefits of using the Interactive White Board in chapter 4).

Phase 3 Implementation Phase: Interactive White Board as a teaching tool

A major advantage of developing modules with the Interactive Whiteboard is to facilitate instructors to save time in preparing their teaching materials and gain additional exposure in ICT integration (Mercer, Warwick, Kershner & Staarman, 2010). Furthermore, instruction is viewed as an important learning tool because it encourages educators to use available tools such as highlighting, circling or using different colours. This expedites the student's ability to acquire new concepts through visual learning (Becta Publication, 2003)

The module achieved encouraging results. This is because the integration of the Interactive White Board as an instructional tool from various studies involved highlighting, colouring, or annotating important content (Türel & Demirli, 2010). In addition to that, the Interactive White Board allows for flipping back and forth to review previous content providing reviewing techniques better understanding (Levy, 2002; Smith et al., 2005). (Refer to Navigation in Chapter 4).

As this interactive lesson allows for handling of information from numerous approaches, Interactive White Board is also able to inspire teachers to create interactive materials with related content (Bidaki & Mobasheri, 2013). Therefore, this new

pedagogical approach introduced in this study will assist instructors to handle lesson management in a more efficient manner. A similar point of view was echoed by Smart Technologies Inc. (2004) where it had mentioned that the Interactive White Board supports greater flexibility among teachers and students as it accommodates for individuals and whole class learning environment. Chandler (2005) clarifies that Interactive White Board offers the teachers strategies to develop interactive teaching.

This is because teachers are able to gather feedback from students by listening to their explanations. Smith (2001) mentioned that using the Interactive Whiteboard helps the teachers to impart activities using ICT resources. He further adds that it encourages interactivity with content and context because this digital lesson supports the handling of information from various expediencies. In implementation phase successfully gather active participation from the students, and they were appreciated when teachers evaluate their pupils' progressive understanding of holistic meaning (Jones & Tanner, 2002). Beeland (2002) revealed that middle school students have higher engagement level after using three modalities of teaching namely including visual, auditory, and tactile. (Refer to Benefits of using IWB in Chapter 4). He further suggested that instructions integrating these varied learning styles using IWB would increase student commitment in their classrooms. Studies by Beeland (2002) consistently support that integrating Interactive White Boards have increased student involvement and motivation owing to its presence of the three learning modality, particularly to visual learning approach. (Refer to item 4.6.2)

Another advantage from this study is learning with Interactive White Boards in the classroom allows for effective student retention and ultimately improves

performances among learners. This idea was also echoed by Schut (2007) who had conducted a survey on student perceptions of the usage of Interactive White Board in science classrooms. The outcome of the study had indicated that the lesson was more engaging due to its visual elements and multimedia competencies like animations and colorful pictures and diagrams.

Since 1990, there has been a big impact in the areas of teaching with technology (Schmid & Whyte, 2014). A major change can be found in the pedagogical approach taken in most language teachers who are gradually moving their classroom instruction to a more student-centered method which focuses primarily towards social – constructivist teaching technique in a language classroom setting. Therefore, these academicians have highlighted those language teachers are not only promoting constructivist teaching approach but also supports group-based learning. Hence, group- based accomplishments are reciprocal methods applied in a language classroom together with project based learning that is extensively done in a classroom that had integrated the use of the Interactive White Board.

In IWB group students were able to give immediate feedback. This was support by Dudeney, Hockly and Pegrum, (2013) who cited that a unique feature of using the Interactive White Board in a classroom is that it supports immediate feedback and obtaining pertinent ideas instantly during the teaching and learning process that may not be found when compared to other types of technologies that are being used outside their classrooms. Therefore, this instructional approach guides and encourages the students to be ahead of other students because of the early introduction to relevant skills on higher

order thinking like evaluation and reasoning of given information. (Refer to problems and challenges of using the Interactive White Board in Chapter 4)

In IWB group, majority of students found to be more confident. In addition, a research carried out by Vasbieva (2014) supported the observation by stating that the usage of Interactive White Board in a French classroom, enhanced many learners be more confident in presenting their ideas in front of their classmates. Further, this teaching and learning approach enables students to put forward their ideas and information in a more engaging and interactive manner.

Teacher's guide to the usage of Interactive White Boards in classrooms:

Need analysis highlighted that an appropriate pedagogical approach is needed in order to produce a positive outcome from integrating IWB into the classrooms (Refer to Needs Analysis from Chapter 4). This finding concurs with Underwood & Dillon (2011); Hockly (2013), who mentioned that a module integrating the Interactive White Board, will be more eminent with the selection of relevant pedagogical features and suitable instructional design. Moreover, as cited by Dudeney & Hockly (2012), the early adopter of integration of the Interactive White Board in a language classroom was the British Council at the beginning of the year 2000. The current module is in line with the initial intention of the organization to introduce the usage of IWB to cater the current teaching trends in the language classroom without creating much difficulty for the teachers and students.

The current strategy is line with the European Union-funded project which had identified teacher training and having necessary Interactive White Board resources like a teaching handbook for teachers and a video of IWB classroom as two major aspects which able to provide a meaningful teaching and learning experience to both teachers and

211

students (Hockly, 2013) (Refer to Problem and Challenges faced by teachers from Chapter 4)

Hockly (2013) further suggested that the training and modules prepared should focus on student centered-approach for integration of Interactive White Board in a classroom as currently, a large number of lessons emphasizes on teacher-centered approaches. This idea is also echoed by the content experts that the module focuses more towards student centered and collaborative learning at the same time.

Moreover, the content expert have revealed that the module is engaging and promotes interactive presentation which supported by Hennessy (2011) who highlighted that IWB is able to influence the audience and engrosses the whole teaching space. This is because IWB is used as the main platform during a lesson or for presentation. Besides, the interactive features allow to enhanced understanding of the content and promote good classroom management. Furthermore, Reedy (2008) also stated that IWB is the new tool for "presentational approach to learning" and met most of fundamental specification (Passey, Rogers, Machell & McHugh, 2004 and Schut, 2007). Educators integrate various pedagogical approaches to integrate usage of the Interactive White Board by focusing on the needs of the related module which include learning needs, interests, and technical support.

Miller & Glover (2010) suggested that it is necessary for educators to be well-informed of on appropriate implementation methods of usage of IWB in classrooms. Moreover, Avidov-Ungar & Eshet – Alkakay (2011) had mentioned that effective innovative instructional methods using the Interactive White Board can be achieved through the professional development and the preparedness of the teacher to bring about

the changes needed for the anticipated purpose of the integration of the Interactive White Board in teaching space.

Supporting the current finding, Schmid (2006) adds that the impact of the Interactive White Board integration in the learning environment can be easily understood after control for certain confounding areas including purpose of selection of a certain technological tool, teacher's aim in using the tool and matching its relevance with the needs of the module and the students opinion and attitude towards the selected technology together with the conducive learning environment that supports the usage of the technology. Therefore, it can be concluded that, the successfulness of incorporating a particular technology in a classroom is not only by selection of technology but also involved two other pertinent areas which are pedagogical needs and content and the findings of this study also echoes a similar outcome.

Phase 3 Evaluation phase: In this study, a majority of the respondents were Chinese and aged between 18 to 20 years old in both groups. Majority of study respondents have never attended any extra English course. Among those who have attended, IELTS, O-level and IGCSE were prominent.

Five main domains were identified in this study for the use of technology in the classroom. First domain highlighted on the shortcoming on presentation with technology. More respondents from PPT group was significantly disagreed that it is difficult to use technology for presentation, can learn more from books and using technology in classroom is tiring before exposure to technology. After introduced to technology, both groups showed improvement however, they are not significant. This showed that both PPT and IWB have improved the shortcoming in presentation with the use of technology. This was supported by Mann et al (2002).

213

The authors stated that exposure to technology in the classroom had encouraged an alternative approach and indirectly can improve their achievement. Vannatta and Beyerbach (2000) in their study found the usage of technology in classroom was well accepted as it enhanced basic computer knowledge. In contrast, Cuban et al (2001) observed a decline in agreement in using technology in class as it diverts student's concentration.

The second domain emphasized the effectiveness of using technology to enhance a presentation. More than half of the respondents strongly agreed that they enjoy a classroom instruction using technology, can get a good job if able to use technology/computer for presentation and it is important to be able to use technology for verbal presentation especially among PPT. After exposure to IWB or PPT the degree of agreement increased more among IWB group all al the three aspects. Gillman (1989) supported the current findings that usage of educational technology may enhance the instructional program as well as visual presentation. At the same time, usage of technology had enhanced interactive teaching and learning particularly in higher learning institution in Malaysian classroom

The third domain had highlighted the aspects in engaging presentation tool. The study found that after usage of technology, the students also significantly and strongly agreed that it is important for them to do the best in all assignment and they would always try to complete the assignments. The finding was supported by Prensky (2007) and Fawcett (2000), the usage of IWB promotes collaborative, learner-centered, and inquiry-based learning and hence improve their understanding. In Malaysia, Perinpasingam et al (2014) stated that students more likely to engage presentation tools such as SMART Board as educational instructional tools in classrooms.

The forth domain had highlighted the perception of effectual communication tool. The study found that the students' perception that IWB can be used as effectual communication tool had improved significantly. The finding was supported by Bature (2016), where proficiency in English is to be achieved, when the technological approach has been developed. The study also found the technology was an effectual communication tool, especially in a multilingual setting. In addition usage of technology has solved all problems confronting English teaching and learning in higher education that cause poor performance of students. Mahmood and Bhokari (2012) found the role of ICT tools in enhancing teaching and learning and improve students' problem-solving skills. It is highly agreed that effective use of ICT enhances teaching and learning as well as improving students' problem solving skills.

The final domain emphasized the perception of student enthusiasm using technology. After technology been introduced in the classroom, more IWB group students significantly perceived that they can concentrate better on the lesson with technology use in presentation. Similarly, Vannatta & Beyerbach (2000) in their study found the usage of technology in classroom using workshop approach which enhances the attention of student in the classroom. Few studies have supported our findings where this creative way such as graphics and pictures were inserted to attract the students' attention have improved audience's attention (CITT, 2016).

There are no significant difference was observed on the perception of student in pre-test and post-test across the gender, ethnicity, English speaking proficiency as well as in English writing proficiency. It is believed that IWB has potential to minimize gender, ethnicity and proficiency difference in English language teaching and learning. The finding was supported by Dhindsa (2011) where in Brunei the mean achievement scores

of male and female students taught using constructivist approach were statistically non-significantly different.

Within these domains, the students' perception on the shortcoming on presentation with technology (Domain1), effectiveness of using technology to enhance a presentation (Domain 2) and engaging presentation tool (Domian3) was significantly improved after using IWB in the classroom. It is hypothesized that students' preference towards IWB usage was more likely for the purpose of presentation but not for communication. Student showed non-significant in enthusiasm using IWB, which indicates that the students more likely to use various type of technology rather than retain a similar method.

Implication of Research

The implication of the study focuses on the usage of instructional design approach and module development using the Interactive White Board as a presentation tool.

Implications for Instructional Design: The development of the presentation module using the Interactive White Board carries out a development research method that consists of numerous segments, and is established based on the social constructivist theory. This process was done to ensure that the module was developed using appropriate theories together with proper design and learning principles. In order to meet the requirements of the intended users, the formative and summative evaluations were included in the development phase.

The presentation module using the Interactive White Board was designed from the topic taken from the module outline of English 1, a module offered to semester 1, foundation students. These students were given training on the usage of the Interactive

216

White Board as a presentation tool. Furthermore, necessary rules and presentation strategies were given during their tutorial sessions prior to their final presentation.

The design phase of the module involved experts who have evaluated the content to be imparted in the lesson, relevant technological skills needed by the learners, accessibility of the tools, designing of the module based on learning principles and the evaluation phase to assess on the appropriateness of the module. This development approach can be used and adapted to other subject matter apart from a language classroom setting.

Improvement in students' performance with the integration of the Interactive White Board: Based on the findings obtained (refer to Table 4.35) there has been a positive influence in the scores of students who have conducted their oral presentation using the Interactive White Board. A similar finding was also obtained from a research conducted by Bivora and Vasbieva (2016) who have conducted a study on the integration of the Interactive White Board to gauge progress on learners achievement on grammatical proficiency on French as a foreign language module. The findings from the study reveal that integrating the Interactive White Board into the French lesson has shown a positive improvement in interest towards acquiring grammatical knowledge and supports two-way teaching and learning styles as it encourages enhanced discussion among teacher with pupils and pupils and other pupils as a result of straightforward attributes that are found on the Interactive White Board.

Furthermore, the findings also highlighted that using the Interactive White Board as pedagogical tool enhances various interactive games and activities to make learning more student-centered. Additionally, an important observation was identified with regards to the pedagogical aspect of integrating this board into the classroom is that the

217

teaching and learning process is more appealing to the students and they are responsive in class and are more positive due to the beneficial learning experience gained the learners such as it supports an encouraging, favorable and a futuristic innovation.

Moreover, Marzano (2009) cited that a progression in learner's performance in particular after introducing the Interactive White Board in the classroom together with the student response device, usage of visuals to exemplify teaching materials and reinforce correct responses was obtained. In another study conducted by Hockly (2013) indicated that the pedagogical approach incorporating the usage of the Interactive White Board heightened the motivation level and commitment among students. Additionally, Smart Technologies Inc. (2004) carried out a research and the outcome of the study revealed that nearly two-third of the instructors felt proud upon knowing that a noteworthy progress in learner's approach and respond to Mathematics lessons.

Another benefit of teaching using the Interactive Whiteboard can be found in the special needs learning environment. Learning by incorporating Interactive Whiteboard in the classroom supports better recall of knowledge and eventually increases students' achievement. This idea was also cited by Schut (2007) who had carried out a study on learner's perception of using the Interactive White Board in science classrooms. The findings from the research have suggested that the module was extra appealing because of its graphics features and hypermedia capabilities such as moving picture vibrant colours and illustrations.

As mentioned by Becta (2007,2010), the outcome from a research on the progress phase of the Primary Schools Whiteboard Project than having obtained £10 million in the year 2003 to 2004 to improve the achievement and implementation of the Interactive White Boards in primary schools in 21 local organizations. The Primary

Schools Whiteboard Project indicated that teachers have greater work contentment and learners were motivated and eager during the classroom lesson using the Interactive White Board. Furthermore, an important result had shown a growth in pupils' accomplishment for both male and female students after conducting an analysis prior to the introduction of usage of Interactive White Board and two years later, when the use of the Interactive White Board was implemented in the classroom.

Additionally, according to Missildine, Fountain, Summers, and Gosselin (2013) who cited that transformational teaching approach where the educators move away from a chalk and talk classroom practice to a technology integrated learning environment have revealed an improvement in student achievement. This research focuses on a quasi-experiment method carried out at a nursing school with three learning approaches namely in-class lecture only, lecture capture and technology incorporated classroom instructions.

In conclusion, as suggested by Silvernail and Gritter (2007) instructional technology methods can bring about improvement in student achievement. This can only be done when the teachers have a clear plan of choosing relevant technological tools to match with intended outcomes of a particular module and focusing on learners needs for the selected module.

Implications for Teaching and Learning: The ADDIE model was used to methodically organize the process of instructional design of the module with the integration of Interactive White Board. The ADDIE model is a developmental framework that comprises of five main steps which are analysis, design, development, implementation, and evaluation. The results from the phases mentioned above of the research have made known that these areas were pertinent to the implementation of the presentation module

using the Interactive White Board. The needs analyses phase was used to identify the learner's abilities and the selection of the type of technological tool. The design and development phase focuses on the selection of teaching materials taken from the course outline and learning tool.

Apart from that, the implementation and evaluation phase involves the experts for the formative evaluation who have given positive and constructive feedback to enhance the module and the summative evaluation involving the end users who are the students who were motivated with the use of the Interactive White Board as a presentation tool. Therefore, as cited by Underwood & Dillon, (2011) in order to integrate the Interactive White Board as an instructional tool for a particular module, for greater learning benefits, it should be implemented with suitable pedagogical aspects and pertinent instructional design. The lack of study on technology integration for module development is pertinent to this study is a suggestion of an absence is of research to date, regarding the use of IWB as an instructional tool and its influence on students, specifically foundation students in an Architecture classroom of a private higher learning environment in Malaysia and the necessity for more studies of module development predominantly with the integration of the Interactive Whiteboard as visual presentation tools and learner-related aspects of the Interactive White Board use as an instructional tool in the classroom.

Several studies such as Harris, Mishra and Koehler (2009) have discovered that a multidimensional interaction arises when there is the interplay of precise instructional technologies and their related function in classrooms. As suggested by the European Commission (2013) almost 70% of Norwegian classrooms are furnished with Interactive White Boards, nevertheless only 10% of the teachers have investigated the usage of the

Interactive White Board in their classrooms due to the absence of the experience of pedagogical interplay with technology and resources.

As suggested by Campregher (2010), a new innovative technology such as the Interactive White Board has changed numerous educators' perception towards incorporating this interactive tool into their modules. These teachers are more confident and enthusiastic in using this tool to enhance their pedagogical approaches. Moreover, the researcher had highlighted that the Interactive White Board encourages various learning and thinking techniques and accommodates learners with numerous of aptitude levels as well as learning in a collaborative environment. An evaluation type research was carried out by Learning, P. I., & Initiative, T. (2009). There were 471 educators who have participated in this research where these educators have integrated numerous kind of technology in their learning environment. The findings from this study reveal that many teachers felt very positive and confident towards using the Interactive White Board in their classroom at Kazakhstan simply because they found this tool to be can be easily adopted into their teaching approaches for their modules and contribute to the learning process at the same time.

In addition, Schmid and Whyte (2014) have distributed a book with various case studies on the advantages of integrating the Interactive White Board such as captivate the learning process with positive results among educators. These outcomes are then grouped together and exchange with other teachers and to encourage more educators to include this interactive board in their respective classrooms to reduce the resistant of the teacher to change their pedagogical style. Furthermore, the researchers have encouraged that other educators to view website *iTILT* website (iTILT [www]) as it includes sample lessons designed for language teachers on the integration of the Interactive White Board

to support and motivate more teachers to discover new possibilities that the Interactive White Board can be introduced in their learning environment.

In Malaysia, the literature has shown an inadequate attention to module development especially interactive modules development method, particularly teaching students at a private higher learning institution in Malaysia (Perinpasingam, Lee, Cheah, Lee & Arumugam 2014 and Perinpasingam, Ng, Hassan, Arumugam 2016). Therefore, the findings from this study can be used as a guide by educators to develop interactive modules that can be used in their respective classrooms. In addition to that, according to Hennessy & London (2013), a similar viewpoint was highlighted on the integration of the Interactive White Board as an instructional tool which lacks the interplay between technology and pedagogy. (Refer to Table 5.1 and 5.2)

Table 5.1:

The process in development of an Interactive Presentation module using IWB

Design	Area	Details	Development phase
Subject matter	Analysis of teaching	- Curriculum specification - approach for teaching and learning - Interview	**PHASE 1** ANALYSIS
Leaners	Analysis of learning	- Survey - Use of technology tools - Skills in technology - Perception of technology tools (Ppt & IWB)	
Subject matter Interactional designer	Design of module	- Task analysis - Syllabus - Outline of module - TPACK model - Gagne Nine Event of Instruction - Activities - Interview - Learning tool – IWB	**PHASE 2** DESIGN & DEVELOPMENT
Subject matter (teacher)	Formative evaluation	- Social constructivist theory - Management of module - Interview - Interactive learning system (Kristof & Satron,1995) - Information Design - Interactive Design - Presentation	

223

		Design	

| Subject matter expert and instructional designer) | Implementation learner evaluation | Orientation to IWB and environment Trainings and in class practice. | **PHASE 3** IMPLEMENTATION & EVALUATION |
| Learners | Summative Evaluation | Survey on perception. Assess performance Interview | |

Table 5.2

Guidelines for development of an Interactive Presentation Module Using IWB

No	Areas	Description
1.	• Analyze the background of the learner • Use the information to determine aspect of training required for learner	Determine the skill set of the learner in the following: • Skills in the use of the computer for gathering information; • Skills in technology and communication. Specifically, in the use of e-mails, search engines and Whatsapp. Obtain information on the use of technological equipment's • Frequency of use of device for specific purposes such as ICT for research, or for communication Determine the learners' perception towards technology to determine value of the tool; • Impression of the usability of the tools for presentation (PPt and IWB)
2.	Devices and other equipment which is available and can be accessed by learner in the university (Devices use to leverage on ICT initiatives in the University.	Identify type of equipment that learners have access in the university: • Information on ownership of device, • Portable or static devices • Shared or personal The availability of IWB in the University and to support innovative and interactive presentations among leaners. In addition, this innovative pedagogical able to support student-centered and collaborative learning in a static environment.

224

No	Areas	Description
3.	Design of activities for an interactive presentation module	Engage learning tools that cater for interactive presentation through group based learning • In-class activities and trainings • Group presentation Identify strengths and weaknesses of the type of the pedagogical approaches, learning needs and goals Design tasks that are authentic and are meaningful • Real-life projects and issues • One major issue or topic with several subtopics • Relate to learners' experiences and interests • Activities to provide opportunities for reflection • Allow learner flexibility to discuss on specific items like deadlines and selection of topics Provide guidance through training and tutor scaffolding • Guidelines for the course, • Lessons and tasks • Varied group size - 4 to 5 students • Exposure to software and usage of IWB • Supports three modalities of learning: Visual, Auditory and Kinesthetic. Caters for individual differences with varied learning styles.
4.	Collaborative learning environment	Allow for a platform for discussion and group practice • Face to face discussion in specific small groups • To initiate activities and practice to familiarize with the software and available interactive tools on IWB. • To get hands-on participation and initiate preparation for an interactive presentation. • Whole class discussion on learners' views and expectations of learning but within rules in the environment • Provide opportunities for feedback, and inquiry on areas of interest
5.	Scaffolding	• Use more instructional scaffolding training and manuals in the early stages to allow students to familiarize with IWB as a presentation tool. • Support peer interaction

Suggestion for further research: In this study, the module using the Interactive Whiteboard was used to encourage interactive and engaging teaching and learning. This digital lesson has brought a collaborative and active learning approach into the teaching space with the help of the interactive features available on the board together with graphics, clipart and videos that were inserted in the module. Future studies that involving more advance technologies and skills are needed to evaluate the intensity of usage of technology in classroom.

One area that can be looked at for future studies is to investigate on the opinion and involvement of learners with different learning styles, subject matter and group size. A study conducted among students from different disciplines or programs is needed to evaluate the effect of usage of IWB from different spectrum. Besides that, a study testing a Multilanguage of module is needed as Malaysian consists of a multilingual population. Furthermore, another possible area for future research is to conduct a case study on the effectiveness the module together with the development of cognitive skills.

Future studies should include evaluation of sensitivity and specificity and predictive values of IWB usage in classroom as well as cost benefit evaluation of this technology for potential use as educational tools in schools. The difficulty in using and implementation of IWB increases the importance of identifying the factors that might contribute to this condition.

Due to the limitation of this study which was carried out at a single Malaysian private university, a multi-centered study with a larger sample size may provide stronger evidence. In order to improve the generalization, we should focus on all Malaysian

universities. Further ideas for reversing the differences should be explored for future generations of Malaysian students so that they can be freed of the observed bias.

The students' enthusiasm using technology in the classroom did not improve even after IWB was introduced. New technology integrated models of teaching and learning are needed to be implemented for improving students' enthusiasm. Students should be provided with equal opportunities of using technology in the classroom. Furthermore, they should have equal access to the facility of technology available in the universities. Training infrastructure should be set up in the universities to provide training to students especially for those with low enthusiasm.

All the universities may be equipped in such a way that the availability and accessibility of technology such as IWB, resources and facilities may be in accordance with the strength of class. University management enforcement for technology usage and incentives or rewards for the students/teachers to use technology may be enhanced for getting appropriate equipment for the higher learning institutions. In conclusion, a further study can also benefit educators as it can bring about transformation in pedagogical approaches through trainings and professional development programmes.

When designing modules, we would argue that it is important for teachers to be aware of concepts of deep and surface approaches to learning. Arising from the current study, there are implications in terms of module design. Seeking to incorporate the following to the module design can offer a greater likelihood of fostering a deep approach to learning such as sustained interaction with content and others, relating new ideas to previous knowledge, providing explicit explanations and a clear knowledge base to students, structuring in a reasonable student workload, providing opportunities for students to pursue topics in depth so that they can understand the material for themselves,

and ensuring an appropriate formative and summative assessment strategy. These ideas resonate with teachers in today's higher education environment and have implications both for our choice of learning and teaching strategies and how we assess learning. An awareness of these approaches to learning is fundamental to the entire module design process.

Conclusion: Based on the outcome of the study, it is desired that this research aims to assist the higher learning institutions to advocate blended teaching and learning approaches to further support the module development process in particular modules involve the integration of the Interactive White Board. Furthermore, this study aspires to encourage educators in particular in private higher learning institutions to create and produce substantial teaching materials with the integration of the Interactive White Board as presentation tool and to bring about new presentation approaches among students from a foundation programme in the School of Architecture at private higher learning institutions to be perceptive in the direction of the contemporary presentation tools especially on the practice of Interactive Whiteboard as a presentation tool.

Additionally, an educational technologist will be able to gain more insight from the outcome of the study in terms of design features and development of teaching and learning materials an interactive presentation module using the Interactive White Board are provided. The data obtained from this study will facilitate creation more teaching materials on an interactive verbal presentation that can be adopted into various modules and stages of the learning process.

Various past studies have analyzed the links with the usage of the Interactive White Board and a diversity of areas pertinent to the use of this technology and student engagement as well as achievement in classroom lessons. The ideas of social cognitivism

228

and constructivism were obtainable as the related learning theories and the incorporation of the TPACK framework to improve the relationship of the three intersections of the framework with the relevance of the integration of the Interactive Whiteboard as a presentation tool in the classroom.

Moreover, other learning aspects associated with this module are interactive learning and learning styles and student enhancement. The outcome from various study have indicated that numerous advantages of integrating the Interactive Whiteboard in classrooms include group base learning, two way communication and student-led discussion methods. In addition, past researches have recommended that the introduction of the Interactive White Board intensifies student interest and responsiveness primarily to inspire, make the lesson more appealing and to improve performance.

On the whole, results from the analyses and the responses or opinions gained from both the experts and students on the development process of this module were optimistic and promising. Nonetheless, the views acquired from the experts and students were utilized to make amendments on the pertinent areas of the module to further improve the features of this module.

Additionally, another major finding from this research revealed that there is an improvement in students' performance for the group that had conducted a final presentation using the Interactive White Board. In conclusion, the Oral Presentation module is appropriate to be integrated with the Interactive White Board to enhance interactive presentation.

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231

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