EVALUATION OF BAHASA MALAYSIA COURSEWARE FOR HEARING IMPAIRED STUDENT

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ABSTRACT

Courseware learning is learning educational curriculum outside of a traditional classroom. It consists of multimedia element such as text, sound, image, video and animation to help students understanding on particular subject or topic. Kids with disability have difficulties to learn something new especially kids with hearing impaired. Therefore, Bahasa Malaysia Courseware for Hearing Impaired Student (eBM) is designed to help student to improve their understanding about Bahasa Malaysia subject. A preliminary study has been conducted and a suitable method was chosen to develop prototype of this courseware. An expert evaluation were conducted to identify perception of users and user acceptance of this courseware in order to verify the requirement for assistive courseware that address hearing impaired needs in the context of multimedia elements, content and structure of the courseware and also sign language.

Keywords: Bahasa Malaysia Courseware*;* Multimedia Element*;* Bahasa Malaysia*;* Hearing Impaired*;* ADDIE Model

1. INTRODUCTION

Courseware is one of the educational instruction or tools that can be used to help users with disability and give more understanding about how to learn with the help of technology. The existing system has provided a learning method for this disability student, but most of it only presenting instructional materials. Systems are not interactive, and the method of learning does not consider their limited abilities. Teaching student in accordance with their individual needs is difficult and demanding without supportive integrated learning environment [1]. Thus,

courseware system for hearing impaired student must be interactive and easy to use by this student.

Interview has been done to identify requirement, current teaching process and problem in teaching the hearing-impaired student of Sekolah Kebangsaan Pendidikan Khas (P) Kuala Terengganu. From the interview, it is found that hearing impaired students are having difficulties in learning Bahasa Melayu for UPSR. Due to their disabilities to hear, it is difficult to do revision at home without teachers to instruct them using sign language. Some of these students are unable to understand textbook as Bahasa Melayu is not their first language. Instead, they converse day to day using sign language. Due to that, their ability to learning on their own using textbook only is difficult. Hence, not many of them are able to pass Bahasa Melayu in UPSR examination.

Therefore, an assistive courseware to support Bahasa Melayu learning standard 5 was proposed in order to tackle their learning issues. The aim is to allow students to navigate learning on their own at anytime and anywhere for revision purpose. This tools also can be used by teachers in class during teaching and learning session.

2. LITERATURE REVIEW

2.1 Bahasa Malaysia Subject

Bahasa Malaysia is Malaysia national language. This language is used to communicate with Malaysian. It also is a medium of instruction in all primary and secondary schools [2]. It is one of the core subjects that must be taken by every student in Malaysia either they are in private school or not. For student they need to pass for this subject to get pass result. Bahasa Malaysia subject consist of vocabulary, grammar, poems, writing essay and many more. When student in standard 5, the study will focus on language skills, listening skills, speaking, reading and. writing skills.

2.2 Multimedia Courseware

Assistive Technology (AT) is a popular technology used for disabilities people. It is divided into two parts which is hardware and software (courseware). AT design specially for hearing impaired people is referring as Assistive Courseware (AC). AC needs multimedia elements which can interactively attract students' involvement in learning process.

Based on Nur Hazwani, Nurulnadzwan & Ariffin, 2010 cited by [3] multimedia currently widely used in Malaysia education and school after the launching of Smart School project. Even though multimedia catch attention from the educators but the multimedia application especially

AC is still lacking in Malaysian especially in Malay Language [4]. This is not in line with [5] which they mentioned the evolution and development in IT promises every individual to information accessibility, better and more facilities for those in education sector and other fields. They also said everyone should be treated and given equal opportunities in obtaining education either the individual is normal or disabilities.

Then, multimedia element such as text, graphic, animation, sound and video are blending together to produce courseware that can be used in order to increase interest, recognition and memory amongst the HI students regarding subject focusing.

a) Multimedia element for hearing impaired students

There are certain requirements on multimedia elements essential in order to develop special courseware for HI. According to [5] nine requirements were gathered from interview with HI's students and their lecturers, language interpreters and observation through interaction between the students and the lecturers. These finding in Table 1 also supported by finding of [6].

Table 1. Requirement for multimedia elements

Requirement on Multimedia Element	Description
Text	Necessary because HI students could read but it should be straight forward because of low memory ability. Colour combination should be contrast between foreground and background.
Graphic	Necessary because this will help user cognitive load. For example, button will change colour when mouse rolls over.
Animation	Not necessary because HI students are confused by the animation. Additionally, the animation disturbs their attention.
Audio/sound	Not necessary but could be incorporated.
Video	Necessary because HI students rely strongly on visual contents.
Others Requirement	
Content	Enough to include contents in their syllabus
Navigation	Minimal and simple because HI students prefer consistent navigation style.
Layout	Standard and simple because HI students tend to confuse easily with the screen layout. Hence the standard layout should be maintained.
Structure	Simple and standard because most of HI students have low cognitive ability. Then standard structure is enough for them.
Special requirement	The contents are delivered through supports of sign language.

2.3 Theory implemented for hearing impaired

The development of AC would be supported with theory of Multiple Intelligences (MI) which is suitable for HI learners [4]. This theory was proposed by H. Gardner (1983) and noticeable

concerning individual differences. According to H. Gardner (1983), intelligence would be viewed as capacity to solve problems or to custom products that are valued in one or more culture setting. They also mentioned the most important impact of MI theory to educator is it will allow educator to enlarge their method, tools and strategy used in classrooms because the theory serve as one of the most effective curricular and instructional frameworks for classroom educator to use in designing their lesson plan. Due to that, AC should be trial based on 8 types of intelligence which are Verbal-Linguistic, Logical/Mathematical, Musical Rhythmic, Bodily/Kinaesthetic, Visual/Spatial, Interpersonal, Intrapersonal and Naturalistic [4].

Table 2. Eight (8) types of intelligences in MI

| Intelligence	Description
Verbal-Linguistic	The ability to understand and use language, both written and spoken, sensitivity to the meaning of words and the different functions of language.
Logical/Mathematical	The ability to use inductive and deductive thinking, numbers and abstract patterns. It often referred to as scientific thinking – comparing, contrasting, and synthesizing information.
Musical Rhythmic	The ability to discern meaning in or to communicate with tonal patterns, sounds, rhythms and beats.
Bodily/Kinaesthetic	The ability to use and understand physical movement; a mastery over body movement or the ability to manipulate objects with finesse.
Visual/Spatial	The ability to perceive and recreate the visual world accurately, to visualize in one's head, and give order and meaning to objects in space.
Interpersonal	The ability to make distinctions among other individuals in regard to their moods, motivations and temperaments and to communicate with others.
Intrapersonal	The ability to self-reflect and have an awareness of one's own internal state of being. Ability to define one's own feelings as a mean of understanding and guiding one's behaviour.
Naturalistic	The ability to recognize pattern in nature and to classify according to minute detail.

However, considering of AC propose by Shaffiei et al. (n.d.), eBM courseware applied just seven types of intelligence which are Verbal-Linguistic, Logical/Mathematical, bodily/kinaesthetic, Visual/Spatial, Interpersonal, Intrapersonal and Naturalistic. Musical Rhythmic would not be included as HI students suffer from sound and music[5].

3. METHODOLOGY

In this study, ADDIE Model has been used as development model to develop the prototype of this courseware.

3.1 ADDIE Model

ADDIE is one of the models that has been widely used in developing a multimedia courseware. The phases of ADDIE model are analysis, design development, implementation and evaluation [7]. The ADDIE model has been used as step by step of procedural blueprint of the overall process of multimedia process of the product [8].
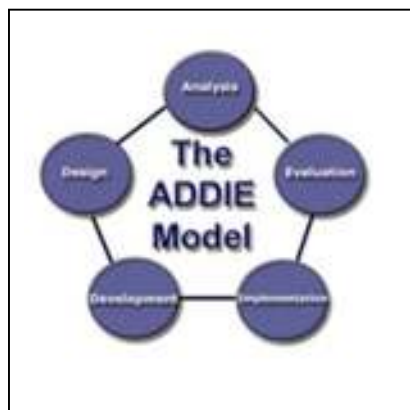
Fig.1. ADDIE Model

During analysis phase, the user requirement is gathered from the interview with SKPK(P)KT's teachers and from literature review. For the content of e-BM, text book and syllabus of Bahasa Malaysia standard 5 students is used to develop the content. Table 2 shows the list of chapters in e-BM based on standard 5 syllabuses.

Table 3. List of Chapter

Chapter	Topic
1.0	Impian Keluarga
2.0	Keluarga Kreatif
3.0	Rumah Impian
4.0	Sihat Cergas
5.0	Cerdas Emosi

During design phase, navigation map, story board, and user interface is created. Navigation map is designed to describe the overview of the chapter in Bahasa Malaysia subject. By using navigation map, the sequence and the flow of the content can be understood easily. Other than

that, blueprint of this courseware is also produced in order to represent the story flow. Blueprint of the storyboard provides view on how the courseware will look like. The suitable interface is used to attract the user interest. The use of color, animation and image are important because most of this student uses their eye to understand the content. It consists of notes that follows the syllabus and provide an activity to make them understand about their need to learn.
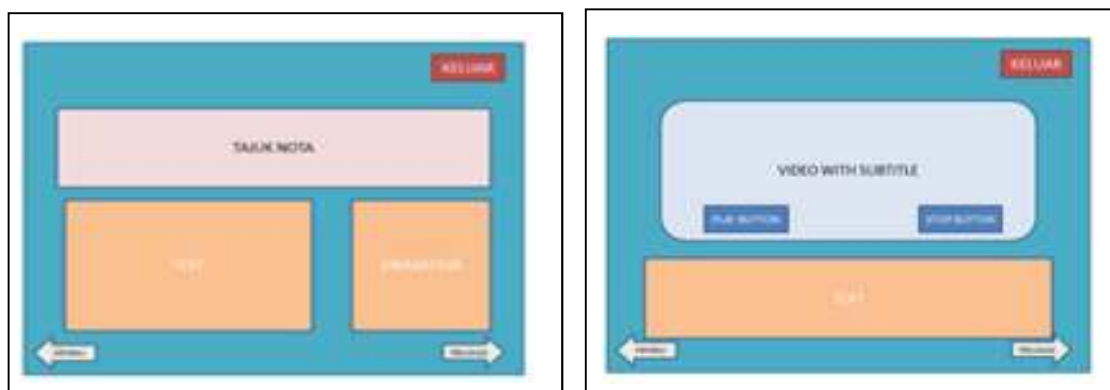

Fig.2. Blueprint of Main Menu

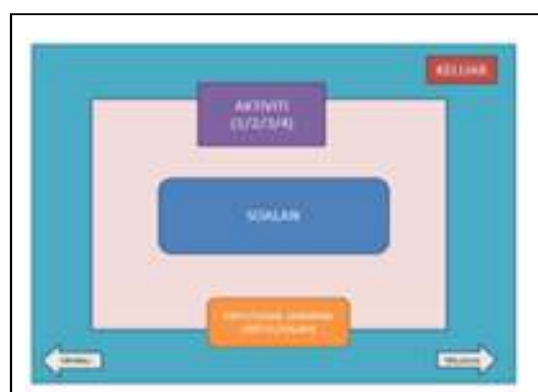**Fig.3.** Blueprint of Video Page

Fig.4. Blueprint of Activity Page

During development phases, all resources and materials including instructional aids, resources, and tools are used to create the courseware. Testing and editing are conducted along this process if any error occur. After development is completed, implementation phase will be started [9]. During the implementation, this courseware will be delivered to hearing impaired student standard 5 of primary school and the teacher of Bahasa Malaysia subject that teach hearing impaired students. The complete courseware will be tested by 6 users to identify user acceptance and the need of hearing impaired students

3.2 Evaluation

In developing the prototype, all the guidelines and principles that identified in Literature Review are being implemented in the courseware. However, to test user perception and acceptance towards the application, 6 users has been selected among hearing impaired teachers and students of Sekolah Pendidikan Khas (P) Kuala Terengganu. An interview was conducted to understand student and teacher's perception towards the application. The interview was assisted with sign language expert that act as translator between interviewer and students. The aspect evaluated are the multimedia elements such as the suitability of text, graphic, animation used, audio, video, content, layout and navigation, application's structure and also the delivery of sign language content in the applications. The suitability of the courseware content in terms of verbal-linguistic, logical, kinesthetic, visual, interpersonal, intrapersonal and naturalistic intelligence also are being measured.

This study gathered feedback data from three (3) teachers that taught hearing impaired students Bahasa Malaysia Standard 5, sign language and also Bahasa Malaysia Standard 6. Three (3) shearing impaired students also involve in this experiment as user of this courseware application. Based on the observations and interviews, students are able to understand more on the topic compared to the traditional classroom learning. Students are able to engage with the learning content as it combines different type of multimedia elements such as video, graphics and also text. With the used of different type of media content, cognitive load is reduced, hence students are able to understand more of the content rather than memorizing the content without understanding (Swaller, 1988). Students engagement towards the courseware are better than classroom learning. Based in their teachers, hearing impaired student often difficult to participate with class activities and tend to feel bored during learning session. This is because, they are not able to hear teacher's voice and the only communication are done using sign gestures.

Therefore, based on the research findings, there is a need to develop an assistive courseware to help teaching in learning not only in classroom but also for revision purpose for hearing impaired students. However, certain elements have to be implemented in order to ensure user acceptance and to cater all user needs. Instructional elements such as text, video and sign language has to be include in the courseware. This is because, hearing impaired students are dependent on sign language video embedded in the courseware to understand the learning content and to participate with the lesson activities. As for text, minimal use of text is needed and straight forward as these students has less cognitive load. It is difficult for them to memorize and remember everything. Therefore, it is important to keep any text to be simple, understandable and precise. As for multimedia content such as animation and graphics, it is important to minimize the use of animation as it can disturb student's attention towards the learning content. However, graphical pictures are necessary as it can help student to remember the content more. Layout and navigational aspects of the courseware also has to be paid attention as complicated navigational map can cause students unable to navigate and learn on their own. Table 4 shows the findings of the evaluation.

4. CONCLUSION

Based on the research findings, there is a need to develop an assistive courseware to help teaching in learning hearing impaired students. However, in order to ensure user acceptance and to cater all user needs of hearing impaired students, the elements listed in Table 4 can be used as a guidelines for designers in designing hearing impaired assistive courseware.

Table 4. Evaluation Finding for eBM courseware

Element	Description
Text	The use of text in the application is minimum. However, the teacher and student prefer the use of font type Comic Sans as it is clearer and improve readability among students. This is because, students are familiar with the use of Comic Sans font type as their text book also use the same font type. Using the same font type somehow increase student's readability due to familiarity.
Graphic	The use of graphic is acceptable and help students to remember the content more
Animation	The use of animation distracts students focus during learning.
Audio	The use of audio helps certain Hearing Impaired students that still can hear and not completely deaf. Although not all student can benefit from this, some of hearing impaired students actually can still hear some of the sound coming from the application. This helps these students to pronounce and understand the content of Bahasa Malaysia topics.
Video	With the use of video in the application (showing sign language to help student understand the words) students are enjoying the learning process and engage with the learning. They keep watching the video in the application and nodding their head as gesture of understanding the topic presented in the video.
Content and Content Structure	The content of this courseware are adapted from Bahasa Malaysia standard 5 text book for hearing impaired students. The content is simple, precise and straight forward. It is easy for students to navigate through the courseware as it is highly structured.
Layout & Navigation	Student prefer to learn on their own and navigate the content themselves. However, some of the students find it difficult to navigate back to previous page without assistance. A navigational map is needed to help students learn and navigate to any desired pages or topic
Sign language	The sign language video in the courseware is acted by their teachers. The student is familiar with the use of 'Kod Tangan Bahasa Melayu', therefore students are able to understand and enjoying the video and content of the courseware.

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