Learning Material for Indigenous Students of Primary Schools

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Abstract— **This paper presents an ongoing study on the development of a learning material for the indigenous students of primary schools. It aims at proposing the components of the suitable learning material for the indigenous students, which is named IndiWare. To achieve the aim, this paper explains about the requirements gathering and the design and development activities. This paper starts with some facts on the backgrounds of the study. It is followed with a brief explanation on the methods, and followed with a section on design and development of the IndiWare. Finally, a section concluding this paper includes the plan for next follows. This paper found that the IndiWare has been informally well-accepted by the indigenous students.**

Keywords— **Learning activity, usability, indigenous children**

I. INTRODUCTION

Multimedia makes use of many digital media formats such as text, pictures, videos, and animations, and often have a non-linear structure and different interactive elements which enable users to engage with the material. During the 1980s and 1990s, there was rapid increase in commercially produced multimedia learning materials. At the same time there was both optimism and skepticism about the pedagogical quality of the multimedia material available [1, 2]. At present, the use of multimedia has been absorbed into schools. In Malaysia, all schools are provided with coursewares, developed with contents approved by the Ministry of Education [3, 4] to ensure their reliability.

Digital multimedia materials have been said to hold many promises, such as motivating for students to work with [5]. Also, it is very engaging and holds the students' attention [6]. The philosophy of multimedia which is interactive is to help in creating knowledge, besides providing guide and widening the locus for thinking. With the ability to allow learners to click-and-browse; view animations, simulations, and real videos; inquiry-and-feedback; self-determined order of navigation, the interactive multimedia applications are reported by [7] as able to increase learners rate of understanding. When comparison was made between 12 learning methods and their rates of understanding, it was synthesized that **learning through interactive multimedia** carries 90% of the rate of understanding [7].

In relation with the previously discussed courseware, this type of content has been proposed for different types of users. In addition, in the advantages of rich media elements and interactivities, coursewares have not only been developed for normal students but also for the disabled. In conjunction, works have been explored to develop coursewares for visually-impaired students [8] hearing-impaired students [9], and indigenous students [10]. As a consequence, this study focuses on the indigenous students.

A. Indigenous Students in Malaysia

The indigenous people are the aborigines of Peninsular Malaysia. Most of them descend from the Hoabinhians, stone tool-using hunter-gatherers who occupied the peninsula as early as 11,000 B.C. [11]. Currently, the indigenous people comprise at least nineteen culturally and linguistically distinct groups. In 2009 they numbered about 210,000 [12].

There have been many factors contributing to the issue of school dropouts among the indigenous children such as

low socioeconomic background, difficulty in adapting to new environment, having low self-esteem [13], with very few role models to uplift their motivation and sceptical views from others which make them feel uneasy. In short, there are four influencing factors – the students themselves, family, environment, and school. According to the Director of the Centre of Indigenous Studies Malaysia, University Malaya, the main contributor is the family socioeconomic background of the major education groups that continue to be school dropouts. In 2004, it was recorded that from 25,354 indigenous children who entered primary schools, only 7,559 continued to secondary level [12].

B. Motivation of Study

In relation to the above matter, the presence of the indigenous students and the way they socialize at Sekolah Kebangsaan Taman Gopeng Baru (SKTGB), in Perak has drawn serious attention of this study. They have always been seen sitting in large groups of five to ten students at a time and would never be seen mingling around with students of other races. Currently, 77 students are registered with the primary school for Years 1 to 6. Nonetheless, this ethnic group has always been the topic of discussion during school meetings, especially when academic achievement is concerned. Also, the indigenous students have been labelled as being too cooped-up with their own ethnic group. They have always been more confident using their own mother tongue rather than using any different language. It is a fascinating phenomenon and this study has been keen on finding out how the students would respond if a specially designed prototype is used in the acquisition of the second language.

This study believes that the government's concern over the content development could be utilized in figuring technology-enhanced solutions for motivating the indigenous children to participate actively in learning activities.

A Preliminary study has been carried out in understanding the nature and preferences of indigenous students in learning activities. A series of observation and interviews were involved. In conjunction, the indigenous students were observed in their natural setting, ensuring bias free. In making the study more focused, this study limits to only English subject, and let other subjects unattended. This study argues that learning language is appropriate with aids of computer-enhanced technology.

It was discovered that the indigenous students had never experienced learning English using computer-aided activities. In fact, when asked whether they would like to experience learning English activity using computers, one of the girls refused as she said, she might not be able to handle the machine. However, others were found happy; especially when they were explained about what computer applications are able to do. Of the 21 subjects interviewed, 16 of them have used computer for entertainment purposes such as playing games, while 5 others claimed that they never had the chance to use a computer before. According to the students, the existing courseware provided by the Ministry of Education (MOE) has never been fully utilized and lessons are carried out following the traditional method of teaching practices.

In short, findings of the preliminary study explain that the indigenous students are quite exposed to computers. The courseware provided by MOE might be a good option for the indigenous students to learn English. However, there may be special requirements in terms of features or components to ensure the indigenous students are motivated to learn. This study argues that this issue needs serious attention since the core pedagogical values in one culture are culturally inappropriate in another [14].

Based on the problems addressed in the previous paragraphs, this paper aims at designing a courseware that captures the indigenous students' interest in teaching and learning activities. It is proposed that this type of courseware is called **Indi**genous-tailored course**ware** (**IndiWare**). To accomplish this aim, the following sub-objectives need to be achieved:

- To propose components of IndiWare
- To develop the IndiWare

The IndiWare has been designed and developed involving activities described in the following section.

II. METHODOLOGY

The works involved in achieving the objectives as outlined in Section 1 are divided into two phases, which also support both objectives. Each phase involved different activities as explained in the following paragraphs. Meanwhile, an illustrative summary of the methods is provided in Fig. 1.
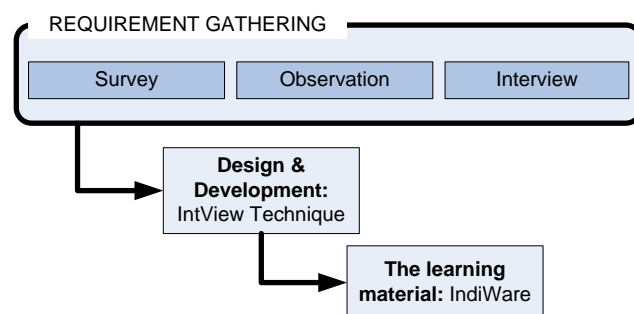

Fig. 1 Summary of activities in designing and developing the IndiWare

Fig. 1 explains that the works in designing and developing the IndiWare consists of requirement gathering and design and development. Furthermore, in gathering appropriate requirement of the IndiWare, survey, observation, and interview techniques were utilized. Meanwhile, the IntView technique was adapted in designing and developing the IndiWare to incorporate the requirements.

In terms of the requirements, it was found that the indigenous students are lacking in motivation; prefer simple interaction and less complicated procedure. Contents must be minimal to maintain their focus. Apart from the contents in the learning material, they are highly attended with moderating background music for interest-capture; otherwise they tend to lose in their concentration. The remaining elaborations of the components are included in the explanations about the IndiWare in the following section.

III. DESIGN AND DEVELOPMENT

Having collected the requirement, IndiWare was then designed. As stated earlier, IntView technique was adapted. There were 17 steps are listed in Table 1.

TABLE I
OUTCOMES OF THE STEPS IN DESIGNING AND DEVELOPING THE INDIWARE

| Stage	Activity / Output
Learner analysis	Indigenous students' learning profile including their special needs for on-screen elements.
Needs assessment	• All contents for the IndiWare • The interface must be suiting the target audience as specified in the learner analysis. • Skills in composing IndiWare (intermediate fidelity prototype).
Specification of educational objectives	As stated by the teachers.
Analysis of content	Must meet the requirements in the course objectives.
Specification of instructional strategies	The learners may need special instructional strategies. This will be based on the components.
Specification of learning teaching situation	Learners use the IndiWare with their teachers in their classroom.
Specification of instructional IndiWare module structures	• Interactivity between user and IndiWare is required. • Tool-tip texts are used when necessary.
Specification of navigational IndiWare module structures	Hybrid navigation style among modules. Within modules are linear navigational to support next-and-next task sequences. The storyboard was outlined at this stage, and is provided in Fig. 3.
Component selection	There is no special component. The details of the instructional and navigational structures are used to determine the components required. The development activities could begin at this stage.
Design of user interface of the IndiWare	Some templates are drafted, and the most desired is obtained here.
Specification of the IndiWare modules	The development phase begins here. The contents of the IndiWare are determined as the modules. All detailed information for activities in pre-development phase will be used as the pre-requisites in this stage.
Structuring of IndiWare module content	Each module is presented in an exclusive page. When the information to deliver is not enough, then sub-pages is used.
Media production	Text, picture, graphic, and other media elements are composed.
Page production	The pages are developed. All details in the activities previously are considered.
Implementation of IndiWare module structure	The pages are arranged as intended, as designed in the storyboard. All navigational elements are made working.
IndiWare module test	This study adapts testing procedure to ensure the IndiWare quality from the work of [15]. The perspective based inspections by instructional IndiWare designer, subject matter expert, IndiWare author, human factor expert, and potential learners are utilized.
Publication of IndiWare module	The IndiWare is not publicized, used only for this study.
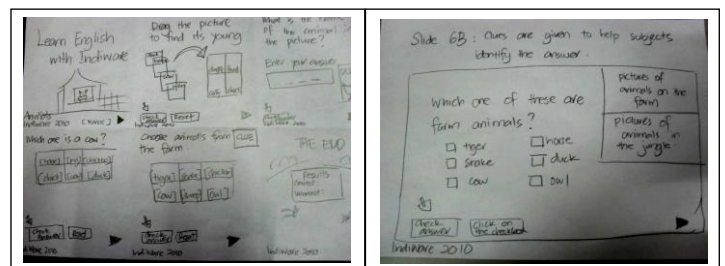
Fig. 2 Storyboard

This study does not publicize the IndiWare, rather it is developed specifically for the purpose of study. Hence, this paper presents some snapshots of the IndiWare in the following figures. When the IndiWare is launched, the welcoming page as depicted in Fig. 2 is displayed.

The title is large, easy for the indigenous students to read. The word "Indigenous" is purposely stated on the page to warmly persuade their feeling and interest, telling them that the learning material is developed exclusively for them. This study believes that this is a very important element, because they always want to be treated differently.
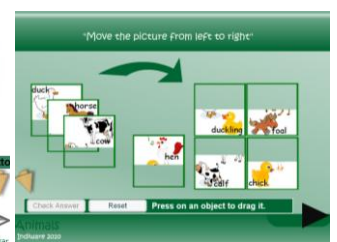

Fig. 3 Mainpage   Fig. 4 Matching exercise

Fig. 5 Completing word exercise

In IndiWare, the indigenous students are provided with simple exercises to generate their motivation and interest

with a matching activity as can be seen in Fig. 4. They are required to drag-and-drop the pictures on the left to the right. Pictures help them a lot in the exercise.

Then, an exercise requiring users to complete words follows. In this exercise, they are required to get the answer from the matching exercise as can be seen in Fig. 5. Also, users are provided with an exercise to guess correct names for provided pictures as shown in Fig. 6.

Fig. 6 Guessing names   Fig. 7 Selecting animals

Fig. 8 Clues are provided

In Fig. 7 to Fig. 10, the indigenous students are provided with selecting animals in different locations activities, such as in farm and jungle. It can be seen in Fig. 8 and Fig. 9 that clues are provided for the users to get ideas.

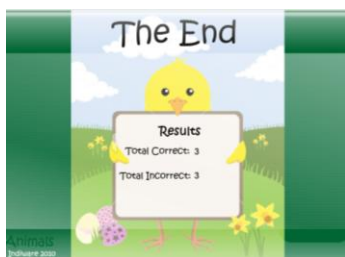Fig. 9 Choosing the perfect answer   Fig. 10 Cognitive-skill question

Fig. 11 Score display

This study believes that providing hidden clues provokes interest among the indigenous students. It does not require any mouse-click, but the indigenous students are required to just mouse-over the button to have the clues displayed. This kind of interaction triggers their attention, and furthermore attracts their positive values. At the end of the exercise, the users are provided with their scores (Fig. 11). This is a very important element to acknowledge the indigenous students on their efforts.

IV. CONCLUSIONS

This study investigates the potentials of implementing electronic learning materials among the indigenous students. In this study, the learning material, which is named IndiWare has been specially designed and developed for the indigenous students, by gathering special requirements through the real subjects and their teachers. This study understands that the indigenous students are quite unique in many aspects. This makes them somehow being unattended to, misunderstood and are often neglected in schools. Hence, the IndiWare may be found unfitting for normal users.

When the IndiWare was shown to the real users, i.e. the indigenous students, they were found to be very excited with it. They were singing and humming along with the IndiWare, chatting with their friends when using it, and keep on learning with it. However, a systematic data collection has not been carried out. Hence, this study plans to carry out a systematic data collection in the near future.

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