International Journal of Technical Research and Applications e-ISSN: 2320-8163,
www.ijtra.com Special Issue 10 (Nov-Dec 2014), PP. 27-30

DEVELOPING EARLY MULTILINGUAL LITERACY SKILLS THROUGH A MOBILE STORYBOOK READER APPLICATION

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***Abstract*—This paper describes the design of a mobile application, termed Multilingual Mobile Storybook Reader (MMSR), which is aimed at developing early multilingual literacy skills in a mobile assisted language learning (MALL) learning environment. The MMSR forms a hub in the MALL model, with adults scaffolding preschoolers' early multilingual literacy development in a shared meaningful interactive multilingual storybook reading environment. The model will be tested and evaluated through a multilingual reading programme that links school and homes; with a shared purpose of developing children's early multilingual literacy skills.**

***Index Terms*—Early Multilingual Literacy, scaffolding, storybook, mobile assisted language learning, zone of proximal development.**

I. INTRODUCTION

The Malaysia government adopts a model of multilingual education in which first language (L1) is used as the medium of instruction and second languages (L2) are taught as subjects in pre- and primary school levels, with the aim of enabling children to be proficient in at least two languages. Primary schools are categorized by types and medium of instructions; national primary schools are government operated and vernacular schools are government assisted. Children in the Malay-medium national primary schools learn English as L2, whereas Malay and English are taught as L2 in the Chinese- and Tamil-medium vernacular schools. This model, however, appears to have several setbacks, which has resulted in, for instance poor performance in Malay among students in vernacular schools and falling standards of English at all levels of education. In addressing these concerns, the government undertook several measures including hiring foreign English teachers, increasing the duration of L2 classes in vernacular schools, introducing a standard Malay curriculum at the primary level, and using online videos to support Malay and English literacy development [1].

The government also adopted the computer-assisted language learning approach to encourage the use of ICT to develop bi- or multi-literacy in primary schools. However, there is a lack of support in developing early multilingual literacy in preschools. This paper proposes a Mobile Assisted Language Learning (MALL) model, which is aimed at creating a multilingual literate community of young readers, supported by a mobile storybook tool, named Multilingual Mobile Storybook Reader (MMSR), to complement the efforts of learning in multiple languages. The MMSR will serve as a hub for early multilingual learning development as well as for adults to scaffold the children's early multilingual literacy development. This paper describes a work in progress of the proposed model, and the design of the MMSR prototype.

II. EASE OF USE RELATED WORKS

Interactive book related technologies have been found to have a positive influence on children's literacy development and motivation to read [2]. Research has highlighted that reading e-books increased motivation and reading engagement of children [3], provides flexible opportunities to read the story multiple times independently [4], and provides exposure to reading strategies and stories with more advanced vocabulary [5]. In the context of bilingual literacy development, the One Character One Language (OCOL) model simulates the one parent one language strategy that is adopted by many multilingual families [6]. In the OCOL model, interactive bilingual storybooks are presented to children, with the assumption that they understand both languages.

Studies have also suggested that interactive storybook reading together with adults scaffolding and children's group participation leads to better literacy skills development [7]. The English as Second Language (ELS) model creates a partnership between children and graduate students to produce multimedia stories with trilingual text (English, Chinese, and the children's native language) and narration [8], however, only one language is presented at a time to the reader. In another project, named Mobile Stories, where children form partnerships to read and create stories in English using mobile devices [9]. The focus of ELS and Mobile Stories appear to be on developing children's English literacy.

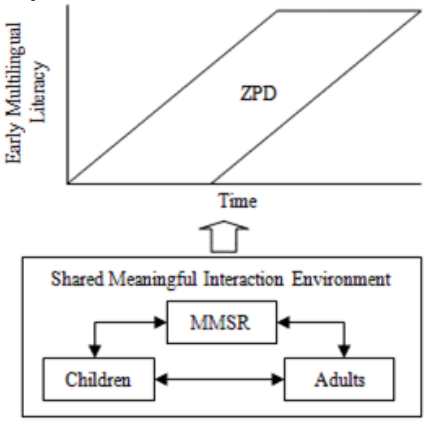

Fig. 1 A MALL model for early multilingual literacy development. (Adapted: [18])

Research shows that children must acquire L1 in order to form links to L2 [10] and are better placed to be literate when they start learning in their mother tongue [11]. Studies have consistently indicated that L1 academic and linguistic skills transfer to L2, even in the case of languages with dissimilar writing system [12]. Bilingual books reading do not meet multilingual children's requirements because most of pre-schoolers have very little knowledge in their L1 and L2. In addition, many of the earlier studies (OCOL, ELS, and Mobile Stories) do not involve parents. However, research informed that parents play a unique role and a motivator to promote their children's well-being and development [13].

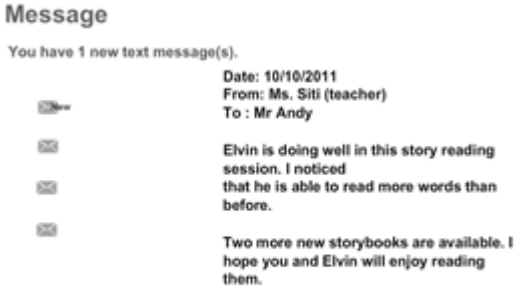

Fig. 2. Message

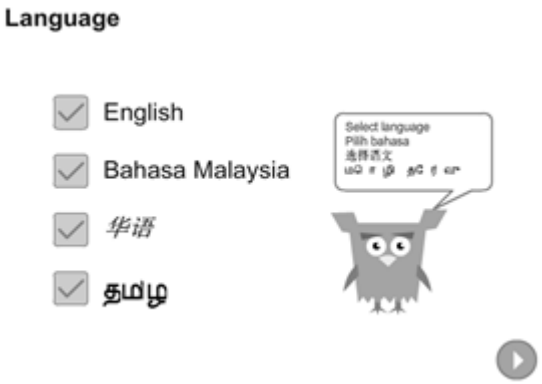

Fig. 3. Language selection.

III. THE MOBILE ASSISTED LANGUAGE LEARNING MODEL

The aim of this study is to develop early multilingual literacy skills among children in Malaysia. The objective is to explore the MALL model in the multi-language learning context. The model is grounded on Vygotsky's key concepts of scaffolding and Zone of Proximal Development (ZPD) [14]. Scaffolding refers to assistance and support that more competence adults offer to children in completing tasks that they are not capable to perform independently. ZPD refers to tasks that children have yet learned, but are capable of performing with the assistance of more competent adults or peers. Vygotsky placed emphasise on the importance of social interaction for language acquisition; children construct new language through socially mediated interaction. With adult scaffolding in a shared meaningful interactive environment within the ZPD, children's multilingual literacy skills would develop over time. Adult scaffolding would gradually reduce as the children's languages developed.

This study proposes to explore the MALL model by creating an early multilingual learning environment, using interactive multilingual storybooks that are installed in mobile devices called MMSR, and to involve adults to play an active role in scaffolding the children's multiple-language development (see Figure 1). The model creates opportunities for children to be involved in social interactions with adults, who will be able to scaffold the children's early multilingual literacy development within their ZPD, using the MMSR, in a shared meaningful interaction environment that involves both the schools and homes. Adults scaffolding can take place in the form of either adults read together with children, read aloud to children, listen to children read aloud, discuss stories with children, and explain words that are deemed to be difficult to children. Storybooks in multiple languages, with the glossary of unfamiliar words and pronunciations help children to understand/read in multiple languages that they are not familiar with. It also provides assistance to adults who are not competent in any of the L2s.

The MMSR employs mobile technology to provide access to interactive multilingual stories. Unlike desktop computer, mobile devices are of lower cost, and require substantially less infrastructure and electricity, making them widely distributed and easily deployable. Mobile devices allow new ways of learning, emphasizing spontaneity of access and interaction across different contexts of use. The portability of mobile devices and its communication features also makes them the ideal platform to involve parents, and link the schools and homes. Today, mobile devices are equipped with communication and multimedia features that could be utilised to link homes and schools. Audio and video recording features could be used by adults for communication purposes, making the scaffolding a joint effort between schools and homes. For instance, the teacher reads an interactive multilingual storybook to children in school and records a piece of instruction on mobile device on how adults can scaffold their children's multilingual literacy at home. In return, parents will be able to send messages to teacher to seek assistance or to provide feedback to teacher on their reading experience at home. In addition, data on children reading, such as number of books read, levels of books, and frequency of reading are available to both teacher and parents to monitor the children's progress.

Fig. 4 Title of storybook in multilingual

In the context of this study, multilingual refers to four main languages of Malaysia that are used as the medium of instructions in pre-schools, i.e. English, Malay, Chinese, and Tamil. Early multilingual literacy focuses on developing early reading skills of the four languages. L1 and L2 refer to all possible combinations of the four languages stated above. Storybook refers to interactive multilingual books which contains stories in the four languages. Adults refer to more knowledgeable individuals such as teachers, parents, siblings,

peers, relatives, etc. Children refer to pre-schoolers aged between 5 – 6 years old.

IV. THE PROTOTYPE

A prototype of MMSR is designed to support and evaluate the proposed MALL model. It will incorporate the following features: (i) social interaction, (ii) cross-language referencing, and (iii) computer-assisted pronunciation training (CAPT).

Fig. 5. A glossary of new words.

A. Social Interaction

In the context of second language learning, Vygotsky pointed to the importance of early real-world human interaction in second language acquisition. The MMSR supports the model by serving as a hub that links three parties together in a social interaction: (i) children (ii) teacher, and (iii) other adults (their parents, siblings, relatives, and neighbours) in a shared meaningful learning environment, where they will be able to scaffold the children's early multilingual literacy skills. Being mobile, it stores interactive multilingual storybooks that children can access anytime and anywhere. MMSR will enable interaction among children with the stories, and between children and adult in both school and homes setting. The same story can be read to children several times in different spaces, times, and languages by different adults. Listening to the story several times allows children to consolidate their learning and deepen their understanding of words in multiple languages. As mentioned earlier, MMSR serves as a communication tool that allows the teacher and parents to communicate; it forms a bridging tool between school and homes. Both teacher and parents will be able to share the information of the children's early multilingual literacy development. In a formal setting in the school, the teacher can read storybooks to children and record a message to assist children and their parents on how to complete a learning task (see Figure 2). In an informal setting at home, adults can read to/with children, listen to children read, discuss stories with children or carry out multilingual literacy activities/tasks.

Adults help to structure or arrange reading task so that the children can work on it independently. Levelled interactive multilingual storybooks of Reading Recovery 1 to 4 will be introduced to children in a progressive manner. Adults scaffolding will be greater at the initial stage on the introduction of each level. Eventually, when the children are independent readers, require less scaffolding and have acquired the reading skills of lower level storybooks, higher levels storybooks will be introduced.

B. Cross Language Referencing

Dual language book enables bilingual children to transfer literacy skills from one language to another [15] and develops "cross-language" connections where they discover similarities and differences in the two language systems [16]. Unlike dual language book, MMSR is designed to support children to read in multiple languages. Texts of all languages are presented simultaneously in a predictable order (Firstly, English; Secondly, Malay; Thirdly, Chinese; Fourthly, Tamil). MMSR allows the user to select the four different languages to be displayed on the storybook (see Figure 3). This feature will allow children and adults to observe the differences of writing system of the four languages.

The MMSR presents texts in four languages simultaneously to develop early multilingual literacy skills and to serve as a cross-referencing for adults who are less competent in a particular L2 (see Figure 4). This feature will also enable adults to scaffold their children's learning, even if their literacy skills in the target language are limited. For instance, a Malay-speaking adult can read and explain new English words in Malay to s/he's child. By listening to stories several times in multiple languages, children will be able learn about the properties of their L1 and L2.

Glossary of words in all languages is also incorporate in the MMSR (see Figure 5). It includes a list of possible challenging or new words in all four languages that the children may need to know before the reading session. For instance, an English-speaking teacher can provide explicit instruction for learning the core L1 and L2 words prior to and/or during the storybook-reading sessions (see Figure 5). The present of children's L1 facilitates story comprehension and vocabulary acquisition.

C. Computer-assisted Pronunciation Training

Computer-assisted pronunciation training (CAPT) can help children improve the pronunciation of L2 at a level comparable to that achieved through traditional teacher-led training [17]. To support children to pronounce words in L1 and L2 that have distinctive reading system, MMSR will make pronunciation of all words available to children for their reference. MMSR allows children to navigate to the previous or to the next page to mimic characteristic of a physical book. It is able to 'read aloud' the texts clicking on a Play button to read a sentence or click on a word to read it aloud in the four languages (see Figure 4). As the Chinese words do not provide clue on pronunciation, Pinyin, the phonetic system for transcribing the pronunciation of Chinese is shown below each word to aid reading (see Figure 4). These features provide opportunities for self-paced practices, by inviting children to repeat utterances. In this instructional setting, exposure to oral examples in L1 and L2s could be from adults or the MMSR. Supported by Text-to-speech engine embedded into mobile devices, MMSR produces near-to-native-speaker pronunciation of multiple languages. In schools, children, for instance, can learn pronunciation of a new Chinese word from a Chinese-speaking teacher and they can use MMSR during or after class to listen to the pronunciation several times. The teacher can also play the pronunciation of a new word in all languages for the children to understand the word, and develop the children's multilingual vocabulary and comprehension of story. At home, adults can read storybook to children in their L1 or L2s or a mixture of L1 and L2s, use MMSR to play pronunciation of words, provide opportunities for children to read words in L1 and L2 aloud, and define words in terms the children can understand.

V. Conclusion

This paper presented a MALL model aimed to develop young learners' early multilingual literacy skills in Malaysia. The model remains to be tested in a systematic way. In the very near future, the MMSR prototype will be demonstrated to teachers and children in a preschool. The questions that need to be answered include: What are the attitudes and behaviour of the children and adults towards reading multiple languages in a single story? How adults scaffold children to develop their multilingual literacy skills using the MMSR in both school and home setting? Does the format of the presentation of stories motivate the children to read in multilingual languages? Much more theoretical and empirical research needs to be carried out in educational technology dedicated to multilingual children. This paper presents the early works in this domain.

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