

Modeling a Mobile Arabic Learning Application for Children in Malaysia

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Abstract: Arabic language is important to all Muslims around the world. It is a sacred language because it is the language of the Quran and Islamic sources. In Malaysia, the people have to learn Arabic language to increase their understanding on matters related to religion because their first language is not Arabic. Among Malaysians, Arabic language is perceived difficult. Recently, many researchers discovered that Arabic language education in Malaysia is unsuccessful and needs radical changes in many ways including the modern teaching aids and tools that need to be incorporated into. The current study is an attempt to design a mobile multi-media application which is named A4Kids to provide fun mobile learning of Arabic language for children in Malaysia. The requirements for the design of the mobile application are gathered from interviews and literatures. Then, a prototype was developed and tested involving real users. The results of the user evaluation on the A4Kids indicate that it is learnable, ease of use and useful for children. Additionally, it is capable to help them learn Arabic easily, directly and successfully regardless of location and time.

Key words: Children, Arabic language, mobile learning, application, evaluation, involving

INTRODUCTION

The way of life of people in the contemporary societies is evolving which implicates also their works and the organizational work styles. This is very much influenced by the advancement of the Information and Communication Technology (ICT). In sync with the current development, the education sector gets also a significant influence and as a result, the way people learn should also be reengineered. While this is broadly seen in learning of various subjects in general, learning Arabic should also be focused accordingly (Kundishora, 2013).

Furthermore, the emergence of the ICT in recent years has become indispensable for both teachers and learners in various fields. In fact, the internet facilities has gradually pushed aside the traditional library from educational scene into digital infrastructure, enabling people to acquire information from a distance. Consequently, the Malaysian government believed that the quality of education could be improved with the use of ICT (Zaki and Danby, 2013).

Arabic language has a special place in Islam and in Muslims hearts because it is the language of the Quran (Bakri *et al.*, 2014). Thus, learning and understanding it is of great importance amongst Muslims so that, they can understand the authentic meaning of the Quran. In

Malaysia, the people have to learn Arabic language to increase their understanding on matters related to religion because their first language is not Arabic (Zailani *et al.*, 2015). Among Malaysians, Arabic language is perceived as difficult and teaching it is also perceived as difficult because it contains significant number of grammar and vocabulary. In fact, students around the world also perceive it similarly as difficult (Alkhasawneh *et al.*, 2013). Recently, Arabic language education in Malaysia is unsuccessful and needs radical changes in many ways including incorporating the modern teaching aids and tools (Muslim and Arifin, 2014).

Learning is a process that is experienced by every human being to acquire knowledge (Hussin *et al.*, 2012). Beyond that, the mobile technologies have also immersed into learning, creating a new concept that enables learning to take place anywhere at any time which is called mobile learning (Judge *et al.*, 2015). This extends learning opportunities for everyone. Now a days, not only adults are carrying mobile gadgets but children too. They spend considerable time on their mobile devices every day. While carrying the gadgets most of the children play games for entertainment including for educational purposes. With the pervasive touch screen technology, the children have great opportunities to learn through technology at a younger age than ever before (Hussain *et al.*, 2014).

خ Kh	ح Haa'	ج Jiim	ث Thaa'	ت Taa'	ب Baa'	أ 'Alif
ص Saad	ش Shiin	س Siin	ز Zaayn	ر Raa'	ذ (Th)aal	د Daal
ق Qaaf	ف Faa'	ع Ghayn	ع 'Ayn	ظ (Th)aa'	ط Taa'	ض Daad
ي Yaa'	و Waaw	ه Haa'	ن Nuun	م Miim	ل Laam	ك Kaaf

Fig. 1: Standard Arabic language letters

At the same time, children have been very much attracted to mobile applications (Zawati and Muhanna, 2014). This kind of application can create and present learning material using visual aids, sound, pictures, texts and video. With the advancement of mobile device technologies many types of multimedia tools have been designed for the purpose of learning language and linguistics. Based on that, a mobile learning application for Arabic language can possibly be used for invoking their interest. In fact, there are some applications available in the market intended for such purpose.

Currently, there are several applications for learning languages and linguistics that have been developed and commercialized such as dynamo.dictionary.com and SpellingCity.com which are available in App store and Google play. They are designed for teaching English. On the contrary, learning applications for Arabic language are too limited (Erradi *et al.*, 2012). Most of these applications do not make use of multimedia elements effectively while some of them do not cover the full contents as intended in the learning of Arabic language (Erradi *et al.*, 2012). In fact, the literatures on the use of mobile applications and technologies for learning Arabic for non-native speakers are lacking.

In the same context, there is a serious lack of local contents in Malaysia, especially for mobile applications including applications for learning Arabic (Muslim and Arifin, 2014). These shortcomings are related to the user interface design such as lack in the use of local language (Bahasa Malaysia) or bilingual interfaces and some limited user interface features like small size of texts and buttons which discourage effective learning activities among the children in utilizing mobile applications for learning

Arabic. This has to be viewed as a drawback and therefore, has to be addressed accordingly (Muslim and Arifin, 2014).

Based on the discussions in the previous paragraphs, it is obvious that the need for mobile multimedia application for children in learning Arabic at their early stage is high. The aim of this study is to model, design, develop and evaluate a mobile multimedia application based on scientific requirements to ensure that the children can learn the Arabic language easily.

Arabic language: Arabic is the most prevalent and spoken by more than 422 million people around the world. Arabic is the first language in all Arab countries and is used in many other neighboring regions such as Turkey, Chad, Mali, Senegal and Eritrea. It is a great importance to Muslims and a sacred language because it is the language of the Quran (Ishkewy *et al.*, 2014). However, research on it is still lacking (Waheeb, 2014). In Malaysia, parents send their children to madrasah/religious school in their early ages to learn how to recite Quran and pray and to learn other basic principles of Islam (Bazeli *et al.*, 2014). As shown in Fig. 1, the standard Arabic language consists of 28 letters. The direction of writing and reading is from right to left.

MATERIALS AND METHODS

This study utilizes the methodology that consists of four phases (Vaishnavi and Kuechler, 2015) as shown in Fig. 2. In the first phase, this research has identified that the problem is about Malaysian, particularly children that have difficulties in learning the Arabic language. In the

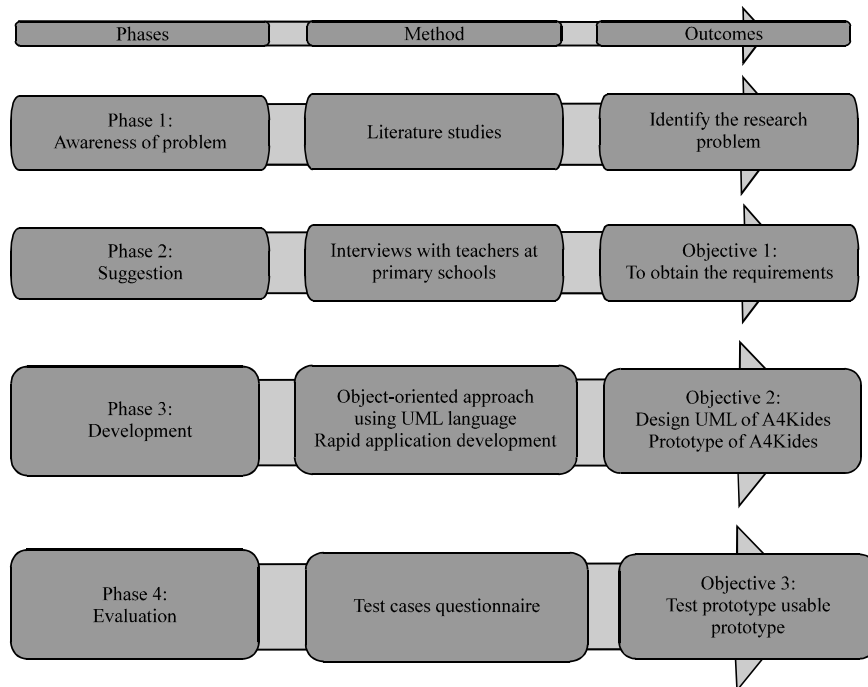


Fig. 2: Research methodology

second phase, information is gathered from the literatures and interviews with teachers to obtain the requirements and design guidelines for creating a mobile Arabic learning application that can facilitate the learning Arabic among children in Malaysia

RESULTS AND DISCUSSION

Data collection and analysis: The information was gathered using several fact findings techniques: interview and literature review that are related to the problem of the current study. Information gathering can be done through direct interviews to find out children’s interest as well as capture the functional requirements of the stakeholders (Hoffer *et al.*, 1999). In addition, review of literatures from the relevant sources like journals, kid’s books, proceedings, thesis and existing application for learning Arabic language is performed in order to gather the relevant information that we need in this study.

Interviews are very useful for information gathering at the beginning of the study which is done by the interviewer to get some information from interviewee (Zhang and Wildemuth, 1998). Interview is normally the first step to understand the user’s condition and their requirements. In order to collect reliable data to recognize the components that should be incorporated in the design of the application, the interviews were conducted which involved face to face, question and answer sessions and discussions with three expert teachers from different primary schools in Kedah, Malaysia.

The first part of the interview contained questions that are related to the respondent’s experience at primary school education. The aim of the questions is to ensure that the respondents have sufficient experiences in the education of children in primary schools. Therefore, their views and opinions can be considered as valid and relevant to this study. In addition, they are also asked about the children’s characteristics in this age and the activities that are fun for them in their classrooms.

All respondents have teaching experience in children education in primary schools between 5-10 years especially with children that age between 7-12 years old. The teachers responded that there are many characteristics of children in this age and the activities that are enjoyable to them during classroom for example: children like to play, like to choral speaking and singing educational songs.

The second part of the interviews involves questions that related to the Arabic language subject and the current strategies and methods used by the teachers to teach this subject. There were many strategies used by teachers to teach the Arabic subject whereby most of the common paper-based methods include curriculum based textbooks, pictures and exercises. The current study found that the main limitation of the methods in teaching and learning Arabic subject is that they are mostly based on the textbooks. Students just viewed the static images on the books without any elements of attractive learning.

The third part of the questions focused on the usage of technology as a support tool in teaching and the existing status of mobile learning for children in Malaysia. The teachers stressed that using new technologies will make lesson more attractive and more efficient and interesting. The technology related approach is still limited. At present, some of the teachers just use CD to support their teaching and learning process which fail to attract student's attention to learn Arabic language. Therefore, there is an urgent need for a modern way to support their teaching and learning process and increase children's attention to learn Arabic language.

The last part of questions are related to the important features or contents that can be employed in the applications to make the applications fun for them. This part of the interview also discussed the special usability considerations to design suitable interface for Malaysian children. According to the respondents, educational contents to be used in the application must be based on the syllabus. Students basically should be taught on how to write and pronounce Arabic alphabets as well as how to pronounce words like days of week, months of year, colors and numbers. The teachers mentioned that to make an application fun for children, the designer should use colorful interfaces, suitable images, friendly human voice, cute characters, traditional (local) clothes and places and games.

Design guidelines of mobile applications for children: In addition to the interviews, the second phase of this study also involves gathering the related information by reviewing from the literatures. In the literatures, many researchers have highlighted various guidelines for developing mobile applications for children. They could be used to assist designers to design and develop good applications. In this context, good refers to fitting the requirements of the target group (students at primary schools). This study has gathered and compiled the design guidelines from the various sources (Kelly, 2010; Bakri *et al.*, 2014; Parsons *et al.*, 2007; Inkpen, 1997; Alsumait and Osaimi, 2010; Jacko, 2009; Large and Beheshti, 2005; Nawi *et al.*, 2015; Nielsen, 2010ab; Kletzander *et al.*, 2014; Goundar, 2011; Wakes *et al.*, 2015; Naranjo, 2011; Iyer and Kalbande, 2014) which are listed in the following points:

- Unnecessary information should be avoided because they can reduce children's attention and focus as well as confuse them
- Text should be easy to read, short, attractive, relatively large and meet the desire of learning material for children

- Use music and sound to attract children's attention
- Using a friendly human voice with child-appropriate language
- Using educational songs to facilitate alphabets and vocabulary pronunciation and memorizing for the children
- Use interesting characters and pictures that should not distract and are also child-friendly
- The main icons should be distinguished
- Use single-click and touch in terms of interaction between users and the application
- Provide repetition (hearing the vocabulary more than one time) can help words learning
- Include self-assessments to advance children achievement
- Use multimedia elements and interface designs that children are familiar with
- Use visual elements include videos, images and texts
- Ensure user-friendliness, support understand ability
- Avoid complex navigation and scroll bars to making children see all of the content
- Ensure consistency because it is the most important aspects in measuring user interface design principle
- Measure the children's understanding through game
- Eliminate extra work (animated graphic, long text, etc.)

Prototype development: Once the information regarding the design guidelines have been obtained, the next phase of this study is the development of the prototype for the mobile Arabic learning application which is called A4Kids. A4Kids is developed for the Android platform using the Java programming language and tools such as Eclipse and Adobe Photoshop CC. The A4Kids mobile application has been implemented and released with two different languages which are Malay and English. Malay is the default language for the application's main interface as shown in Fig. 3. The main activity page provides language icons to switch between the application's languages. In addition, it has the icons for the learning subjects which consists of six main sections which include learn letters, learn words, numbers and colors, days and months, quiz and game.

Prototype evaluation: In the last phase of this study, evaluation of the usability of the developed prototype has been conducted. The evaluation was carried out at seven different government primary schools in Kedah, Malaysia which involve 30 Arabic language teachers who were chosen to participate in usability test to current research (Salim, 2009). The specific schools are: SK Dato' Wan Kemara, SK Bandar Baru Bukit Kayu Hitam, SK Bander Baru Sintok, SK (Felda) Bukit Tangga, SK (Felda) Laka Selatan, Bandar Baru Darulaman and SK Jitra.



Fig. 3: Main interface of (A4Kids)

Instrument for user evaluation: The evaluation method is based mainly on the questionnaires that are provided to the participants in order to evaluate the application (Sardan *et al.*, 2013). Each set of questionnaires for the data gathering starts with four sections. The general section of questionnaire works as a mechanism to collect user’s demographics. The user then executes the tasks through the user interface (Nielsen, 2010). Participants were given enough time to test the prototype and answer all of the questions.

The test was conducted to find out whether children can discover that the A4Kids application to be useful, easy to use and easy to learn. Then, the next step is data analysis which is the process of systematically detailing and arranging the gathered data from the questionnaires. In this study, SPSS Version 20 was utilized for the purpose of analyzing the data. Results from the descriptive and reliability will be illustrated in the next study.

As far as the gender is concerned, eleven of the respondents (36.7%) are male whereas 19 (63.3%) of them are female. Based on the age range of the respondents, 43% of respondents (13) were between the ages of 37-45 years old while 33.3% (10) participants in the 29-36 age range, followed by 16.7% (5) that are more 45 years old whereas the least percentage reached 6.7% (2) which included teachers that aged between 22-28 years old.

For their experience in years in teaching the children at primary school, the highest percentage for the experience is 53.3% (16) for teachers who have teaching experience more than ten years, followed by 33.3% (10) of teachers that have experience between 5-10 years. On the other hand, the lowest percentage, amounted to 13.3% (4) is for teachers that have experience between 2-5 years.

Next, the reliability of the questionnaires are ascertained. The most typical way of determining the reliability of the questionnaires is to utilize the Cronbach’s coefficient alpha (Ameen and Agha, 2015) which projects

Table 1: Cronbach alpha values for all dimensions

Measure	Number of items	Cronbach alpha
Usefulness	7	0.804
Ease of use	7	0.816
Learnability	9	0.826

Table 2: Descriptive statistics of all usability

Items	Usability	Mean	SD
(A4Kids) perceived usefulness			
1	Using (A4Kids) in my job would increase my productivity	4.03	0.809
2	Using (A4Kids) would improve my job performance	3.97	0.928
3	(A4Kids) does everything I would expect it to do	3.73	0.868
4	Using (A4Kids) would enhance my effectiveness on the job	3.80	0.961
5	Using (A4Kids) would make it easier to do my tasks	4.03	0.850
6	I would find (A4Kids) useful in my job	3.80	0.961
7	It is useful	4.20	0.714
(A4Kids) perceived ease of use			
8	I learned to use (A4Kids) quickly	4.00	0.947
9	(A4Kids) is easy to use	3.67	0.884
10	I quickly became skillful with (A4Kids)	3.70	0.952
11	(A4Kids) requires the fewest steps to find the specific phrase	4.03	0.890
12	(A4Kids) is easy to remember on how to use it	3.93	0.907
13	I can use (A4Kids) successfully every time and anywhere	3.90	0.960
14	(A4Kids) avoid me from doing mistake	4.00	0.910
15	(A4Kids) is user friendly	4.27	0.691
16	(A4Kids) is simple to use	3.93	0.868
(A4Kids) learnability			
17	It was easy to learn to use (A4Kids)	3.80	0.961
18	The information provided by (A4Kids) was easy to understand	3.67	0.844
19	The information provided in (A4Kids) helped me in teaching process	4.17	0.747
20	The grouping of menu options logical	3.97	0.850
21	Data grouping is reasonable for easy teaching	4.07	0.740
22	The ordering of information is logical	4.03	0.809
23	The command names are meaningful	3.97	0.928
24	It provides clarity of wording	3.73	0.868
25	It provides no-penalty teaching	3.80	0.961

the uniformity of the items included in the questionnaire. Typically, it is expressed on a numerical scale, starting from zero (quite unreliable) to one (exceedingly reliable). The data for inter-item reliability was determined so as to evaluate the extent of internal uniformity between several measurements of an element.

Table 1 presents the Cronbach alpha value for each measure. The usefulness, ease of use and learnability measures have Cronbach alpha of >0.7, thus, these measures satisfy the internal reliability criterion.

The feedback from respondents are evaluated by using the perceived usefulness, ease of use and learnability. The results of evaluation for perceived usefulness, ease of use and learnability were 0.804, 0.816 and 0.826, respectively which are in the range of strongly agree and agree.

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Table 2 shows the descriptive statistics for all of the items. About 10 items with means 4 and more than 4 are bolded which indicate that most of the participants agree on these items and just being neutral on the rest of the items that are related to the A4Kids. Overall, the results indicate that the participants agreed that A4Kids has good usability.

The result of evaluation confirms that application is learnable, easy to use and useful for children and it is capable to help them to learn Arabic language easily, directly and successfully regardless of location and time.

CONCLUSION

As a consequence to the discussions in the previous paragraphs, (A4Kids) application is developed based on a scientific requirement to ensure that the children could acquire the Arabic language easily. A4Kids application is developed to contribute to the growth of Malaysian educational applications and enhancing the student's learning and understanding of Arabic language especially for Malaysian children.

RECOMMENDATIONS

Based on the results of the usability testing from the respondent's evaluation, it is noticeable that most of the responses generated a percentage of above 80%. Therefore, the A4Kids application is accepted by teachers and can be relied upon as a learning support tool in the classroom in the future.

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