

Prototype Development and Usability Evaluation of a Mobile-Based Arabic Language Learning Application

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Abstract: Learning Arabic has been an issue in the world especially in Indonesia which has the most Muslim population in the world. It has been stated that only 0.5% Muslim in Indonesia can read Al-Qur'an. The researcher proposed a solution with a new method of Arabic learning by implementing a mobile-based learning application so people can be taught easily, anywhere and anytime. Therefore, the researcher decided to study this problem. The focus of this study is to discuss the design of Arabic lessons using mobile application especially in context learning. This research was qualitative. The researcher was evaluating the application by using the usability testing technique. The findings suggest that Arabic learning materials of vocabulary can be improved by applying the theory of second language acquisition. The researcher also found that Arabic learning materials of grammar with the behaviorist and innatist methods are not enough. In addition, the user interface and user experience aspects should be considered to improve learner easiness.

Key words: Arabic, Arabic lesson, mobile application, usability evaluation, Al-Qur'an

INTRODUCTION

Indonesia is a nation that has the most Muslim population in the world. Ten nations that have majority of muslims are home for 66% Muslims in the world. It is a pride to have lived in Indonesia but a question arises "How is the percentage of Muslims in Indonesia who understand Arabic?" In the daily newspaper, Republika, it has been stated that only 0.5% Muslims in Indonesia that can read Al-Qur'an (Ramadhan, 2014). There are two main reasons why Arabic is known to be difficult to learn: from the aspect of linguistics such as speech, vocabulary, grammar and semantic and from the aspect of psychology, like intellectual differences, emotional differences and the learning condition (Muizzuddin, 2011).

From the data above, it is clear that only a few of Muslims in Indonesia understand Arabic. In that case, there must be a new method of Arabic learning so people can be taught easily and it can increase the number of Muslims who understand Arabic. In this digital era, people's flexibility is very high as they have so many tasks to do but do not have enough time to complete them. Because of that, a conventional method will not suffice. Lot of new methods of learning have been developed in this era and one of the examples is online learning. Online learning (e-Learning) is how we use Internet to access learning materials; to interact with the content, the instructor and other learners and to get some

help when the learner is on the process of learning. Its goal is simply to gain knowledge, build their own interpretation and from their own learning experience (Anderson, 2008).

Besides e-Learning, there is another scope from within which is m-learning. m-Learning is a way to learn anytime and anywhere without a physical connection at cable network (Georgiev *et al.*, 2004). There are a lot of advantages in using m-learning such as: it can be used anytime and anywhere, it is cheaper than using the PC desktop, its size is smaller than the PC desktop and it can ensure a bigger engagement because a lot of people have been using it every day (Georgiev *et al.*, 2004). By seeing those advantages, mobile applications can resolve challenges in learning Arabic because they facilitate learner's engagement.

e-Learning is commonly used for general learning and also specific learning like language learning. Some of the language learning methods in e-Learning are similar to language learning conventional methods. This method is divided into three theories: behaviorist, innatist and interactionist (Klein, 1988). Those three methods will be learned more to make an ideal learning in language learning, specifically Arabic learning on mobile application. All things above are the reasons to make an Arabic learning application. Therefore, the study was conducted to design a good Arabic learning in mobile application.

Literature review

Arabic learning: In Arabic learning, there are two main courses that have to be learned, there are vocabulary and grammar. Those courses are taught in al-aswat (Arabic learning for vocabulary voice) and sharaf (Arabic learning for grammar) (Fiddaroini, 2006).

Arabic learning for vocabulary: There are three methods that can be applied to learn Arabic vocabulary: Mim-mem Method (the mimicry and memorization method) a method that teaches learner to memorize a lot of vocabularies by giving them a simple statement or a simple word; language control method, a method to control the vocabulary that is being given from the mim-mem method and phonetic method, a method to make learners adaptive to Arabic speeches from a short statement to a longer statement (Dahlan, 1992).

Arabic learning for grammar (Nahwu-Sharaf): Arabic learning for grammar is not listed as an important learning material. It is wrong to teach learners Arabic grammar from scratch while learners do not know anything about Arabic. It is suggested to use the istimbath method, one of the traditional methods to learn Arabic grammar. This method starts with some examples and then tries to get a concept from them. Those examples must be perfect sentences or a sentence from some narratives. The examples must be presented clearly and have a good understanding. Then, learners are trained to make and give their own examples so they can be active in learning (Madkur, 1991).

Second language acquisition: Second language acquisition will be explained from three perspectives: Behaviorist from this theory, learners acquire a new language by doing a lot of training and drilling; innatist, this theory teaches us that learners acquire a new language by giving them a harder lesson than their own level so that they can think a lot and learn intuitively; interactionist, from this theory, learners acquire a new language by doing a lot of speaking, for example, talking to native, practicing speaking with friends and practicing conversation (Klein, 1988).

e-Learning: e-Learning is how we use internet to access learning materials to interact with the content, the instructor and other learners and to get some help when the learner is on the process of learning and the goal is simply to gain knowledge, build their own interpretation and their own learning experience (Anderson, 2008). "Arabic online" is an example of Arabic online learning

that has been implemented. Arabic online is an interactive Arabic e-Learning. It is ideal for every age. It has an international standardization. Arabic online has also been given an award because its content is suitable to train beginner's Arabic learners.

m-Learning: m-Learning is a way to learn the language anytime and anywhere without a physical connection at cable network. This can be achieved by using mobile and portable devices such as PDA, mobile phone, portable computer and PC Tablet (Georgiev *et al.*, 2004). "Learn Arabic easy" is a good example of Arabic m-Learning.

Learn Arabic easy is an app that teaches the basics of the modern standard Arabic by providing beginner's level-vocabulary, grammar, culture and practice. There are simple step-by-step explanations, plenty of practice of talking exercises. The app provides basic scenarios which one can get started on learning Arabic.

Gamification: Gamification is a design from hardware and software in terms of non-game by using the design element from games (Deterding *et al.*, 2013). This method is usually used to create a playful UX, motivate user's behavior and improve user's engagement (Kapp *et al.*, 2013). Point, Level and Badge (PLB) and leaderboard and another virtual stuff are the game mechanism that is general for the gamification system. These two sub-sections describe what gamification is being used in the application that has been developed.

Gamification in apps: Gamification that is being used in Arabic learning is level, title and progress bar. Level is a representation of each chapter in Arabic learning. Every level contains different learning material and its difficulty is similar to user's level. Progress bar will be an indicator to learner's activity by completing some materials, completing quizzes and completing exams. The three elements above have an interrelated function as it will help monitoring user's engagement and increase user's extrinsic motivation to learn Arabic with playful experience.

Audio-lingual agent: Audio-lingual agent is an animation of living things that is used to create Arabic conversation simulation. Audio-lingual agent can give insight to learners on how to use vocabulary and how to interact with others using Arabic in every level. To maximize the benefit of it, applying a unique plot will give a motivation to learners. Plot is used so that learners can enjoy every conversation and it will motivate them to speak in the conversation that is being given to them.

Universal Instructional Design (UID) for m-Learning:

UID principles have been developed to build flexibility of use into both the instructional design and operating systems of educational materials. In research for usability there are 8 UID principles particularly useful in Distance Education (DE); equitable use, flexible use, being simple and intuitive, perceptible information, tolerance for errors, low physical and technical effort, community of learners and support, instructional climate (Elias, 2011).

MATERIALS AND METHODS

Research stages: This research was conducted by following 5 stages. Figure 1 explains the stages of research for Arabic learning mobile application. First we conducted an identification of problems by looking at the biggest Muslim country in the world: how many people understand Arabic. What method have they been using until now? Is it effective. After identifying the problems, then we did the literature review to strengthen our knowledge in Arabic and to search if any other researchers had been researching similar problems. Next step would be the development of Arabic learning mobile applications and the researcher found that by implementing Arabic m-Learning it could create a new method of learning instead of a conventional method which has to be face to face learning. After the development was made, the researcher had to evaluate it using usability testing and feedback and then the application would be revised according to its evaluation. In the last step, the researcher concluded the result of research.

Instruction learning: According to literature review, Arabic learning that has been developed is intended to provide a teaching session about Arabic vocabulary and Arabic grammar. Learners will be provided with Arabic vocabulary first and the purpose is to familiarize the learners with Arabic so they can learn grammar easier. Figure 2 shows the plot of online Arabic learning. Learners will study Arabic vocabulary first. After they finish learning vocabulary, learners will study about Arabic grammar. In the next step they will be tested to see whether they understand or not about the materials that are being given to them.

Limitation of mobile Arabic learning: The limitation of mobile Arabic learning consists of the curriculum that is provided and the platform that is used. The curriculum for learning Arabic vocabulary is taken from Al-‘Arabiyya Bayna Yadayk book (Abdurrahman *et al.*,

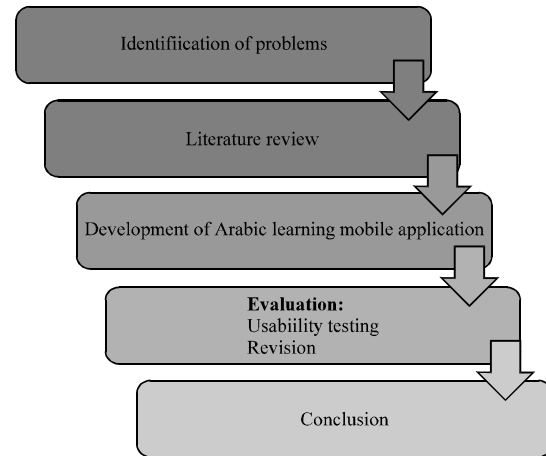


Fig. 1: Research stages

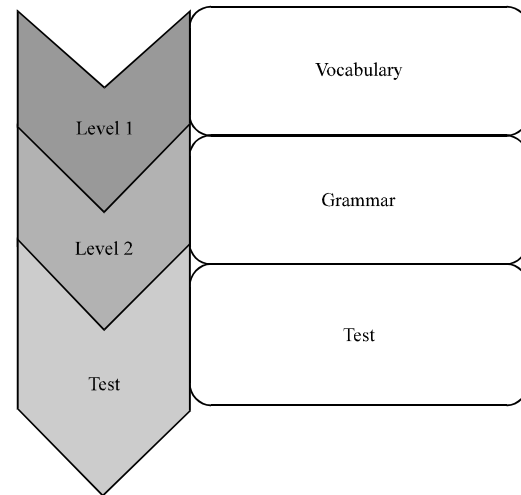


Fig. 2: Model of online Arabic learning

2003). Meanwhile, the curriculum for learning Arabic grammar is taken from Ilmu Sharaf untuk Pemula book (Umam and Hidayah, 2014). However, from those books the learning materials only provide the introduction chapter. Those chapters will be arranged and will be made into materials, training and tests. Materials consist of brief explanation, conversation, and vocabulary dictionary. Training consists of questions that help learners understand the learning materials that have been given. Moreover, tests consist of questions to evaluate learners of what they have learned so far.

Development of mobile application for Arabic learning:

Programming languages used to develop the mobile apps are java and xml. Because the prototype has been

Table 1: Implementation on the design based on second language acquisition theories

Theory	Implementation on design
Behaviorist	Quiz, learning material, exam
Innatist	Silent period, vocabulary dictionary
Interactionist	Conversation with dummy

designed for offline, there are no server and web apps. Environment for the development is implemented similar to android apps environment. Minimum android API is Jellybean/API level 16, based on the data from Google Play API.

Prototyping on mobile platform: Prototyping is emphasizing on UI/UX of Arabic learning mobile application. Of course in terms of creating the prototype, it is based on second language acquisition theories: Behaviorist, innatist and interactionist. Table 1 shows the implementation of those theories in designing the prototype.

Data structure online arabic learning: The data structure online Arabic learning will be focused on level content. Level consists of learning materials, quizzes and exams. Learning materials contain conversation, grammar materials and vocabulary materials. Quizzes contain questions and the answers to make learners understand. Exams contain questions to test the learners (Fig. 3) the illustration of the structure.

Mobile database structure: Mobile database structure is the following hierarchy of mobile database structure android apps. Figure 4 shows the hierarchy of mobile database structure.

Implementation: Implementation for Arabic learning mobile application has some features to support learning, such as login, profile picture, progress, audio, record, quiz, exam and video. Those features were implemented based on literature review.

Current state of application: The application content that has been developed is still in the introduction chapter, and it still consists of Chapter 1 from “al-arabiyya bayna yadayk” book and Chapter 1 from “ilmu sharaf untuk pemula” book. Apart from that the detail of the apps will be explained in these sub study:

- The application has been deployed in Android framework jellybean version
- The UI/UX design has not been adapted for a different size of android devices

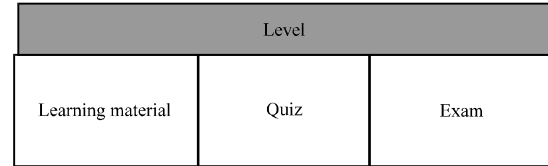


Fig. 3: Data structure online Arabic learning

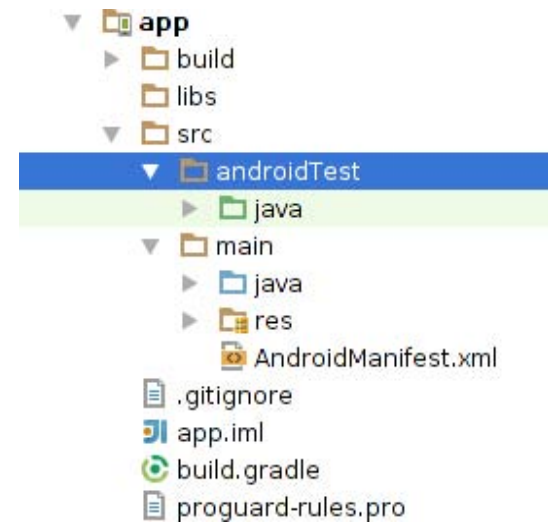


Fig. 4: Folder androidtest

- The vocabularies that have been included are 10 of 143 vocabularies from “al-arabiyya bayna yadayk” book
- The audio that has been included is 10 depending on the vocabularies. Some of the audio is still using developer’s voice and some are professional Arabic learners
- There are 2 levels in the apps, the first one to teach learners about Arabic vocabulary, the second one to teach learners about Arabic grammar
- In each level there are 2 learning materials, 2 quizzes, and 1 exam
- Videos in apps are embedded from YouTube. It is used to teach users for Arabic grammar

RESULTS AND DISCUSSION

Evaluation on Arabic learning mobile application was done by usability testing and feedback. The purpose of usability testing is to test if the application is good and easy to use. Meanwhile, the purpose of feedback is to know specifically any important suggestions to revise the application so that the learning will become better. The evaluation was carried out to identify the Arabic learning

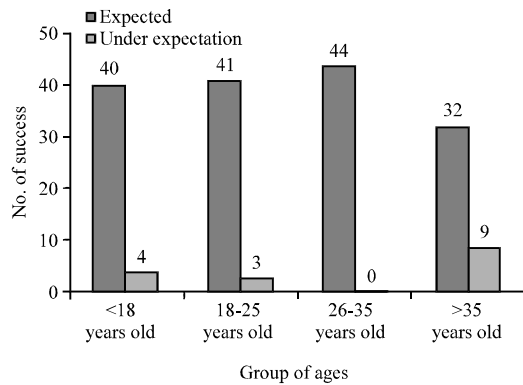


Fig. 5: Respondent's success against expectation

mobile application that has been developed. The evaluation part consists of respondent information, usability testing and feedback.

Respondent information: The respondents were categorized into four groups: the group of under 18 years old, the group of 18-25 years old, the group of 26-35 years old and the group of over 35 years old. Each group consists of 2 people with a difference in Arabic skills: advanced (2 respondents), beginner (4 respondents), never learning before (2 respondents). The differences in skills are recognized to ensure that learning materials in Arabic learning easy to learn for every or any age to get insight from the advanced learners.

Usability testing: The purpose of usability testing is to evaluate the application in terms of UI/UX. Figure 5 shows the respondent's success against expectation. Overall there are 22 task scenarios used in the usability testing sessions and they are:

- Login to tutorial page
- Navigate to home page from tutorial page
- Navigate to profile page from home page
- Change profile picture
- Navigate to level 1 page from home page
- Navigate to course 1 page from level 1 page
- Play the audio from course 1 level 1
- Record their own voice from course 1 level 1
- Reply the question that is asked from course 1 level 1
- Do the quiz from course 1
- Navigate to course 2 page from level 1 page
- Play the audio from course 2 level 1
- Record their own voice from course 2 level 1
- Match the Arabic word and its translation from course 2 level 1

- Do the quiz from course 2 level 1
- Do the exam from level 1
- Navigate to level 2 page from home page
- Navigate to course 1 page from level 2 page
- Navigating course 1 page to its end page
- Do the quiz from course 1 level 2
- Navigate to course 2 page from level 2 page
- Play the video from course 2 level 2

From all the tasks above, there are 10 of 22 tasks that are difficult for respondents, tasks 2, 3, 4, 5, 6, 8, 9, 12, 13, and 22. Almost half of the tasks that are given, therefore there must be a revision to the application especially in terms of UI/UX. It is clearly stated that the group of above 35 years old is having difficulty in using the application. Meanwhile in the group of under 18 years old just 4 tasks are under expectations and in the group 18-25 years old 3 tasks are under expectations. Thus, there must be a special treatment for the group of above 35 years old so they can use the application easier.

Feedback

General recommendation: General recommendation gives insight of the application at a big picture. There are three recommendations. In general the recommendations are in terms of UX that is not intuitive (8 respondents) and less navigation (6 respondents) and also in terms of UI that is rigid in design (4 respondents). Those recommendations indicate the application must be revised on its UX to be more intuitive and have easier navigation and from its UI it should be seen playful and not rigid for learners.

Arabic learning general materials recommendations: General material recommendation gives suggestions based on the materials that are given. There are three recommendations. About 6 respondents said that the concept of level is interesting as it can increase the engagement of learners; 4 respondents said that the concept of level is representative because Arabic learning must be taught gradually and 2 respondents said that the concept of level is simple so learners can easily understand what has been taught.

Arabic learning vocabulary material recommendations: Arabic learning vocabulary material recommendation explains the effect of all features that support vocabulary materials and the recommendation also comes from respondent's suggestions. Features that have been evaluated are audio, record and exams. Audio features have two evaluations: there is a difference between translation and its audio, the volume of the audio is too

high. Record features have two evaluations: the feature is not intuitive, the conversation with dummy material does not have an evaluation of the answer because of that respondents do not know whether their answers are true or not. To fix record evaluations, the feature will be made more intuitive and before they record themselves, there is a tutorial page to explain how to record within the application. Exam features have one evaluation and the feature is not intuitive.

Apart from features, evaluation was conducted by using a test which consists of a quiz and an exam. The result of first and second quizzes is 7 from 8 respondents answered them correctly. The result of the exam is 6 respondents have an A, 1 respondent has an A- and 1 respondent has B+ with grade level of (A)-(A-)-(B+)-(B)-(B-)-(C). By looking at the results of quizzes and exams, it can be concluded that the Arabic learning vocabulary material is good and clear.

Arabic learning grammar material recommendations:

Arabic learning grammar material recommendation explains the effect of all features that support grammar material and the recommendation also comes from respondent's suggestions. Features that have been evaluated are video. A respondent says that the video is too long and it can be divided into pieces based on the material that is given.

Recommendations for grammar material have 4 points. First, the content is not brief enough, so it makes learners bored to read a lot of materials (7 respondents). Second, the content has few examples because of that learners cannot define the difference on Arabic grammar (2 respondents). Third, it uses less refined language, so young and elder people cannot understand the material because the language is not friendly enough for them (3 respondents). Fourth, the video is combined with texts, so learners can read the material while watching the video material (5 respondents).

From the evaluations above, grammar material must have a lot of revision. It can be revised to follow the concept of vocabulary material or focus on revising the content and features of grammar material.

Before and after revision: Looking at all the recommendations of Arabic learning mobile application, the revision will include redesigning in terms of UI/UX of the application at home pages, login pages, material pages, profile pages and exam pages. Figure 6 shows the design before the revision and Fig. 7 shows the revision that has been done.

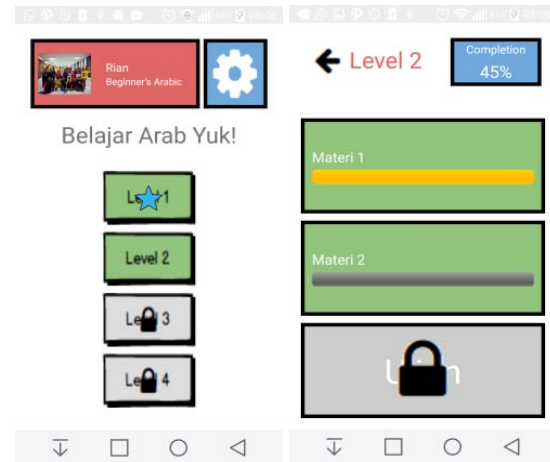


Fig. 6: First design of Arabic learning mobile application in terms of UI/UX

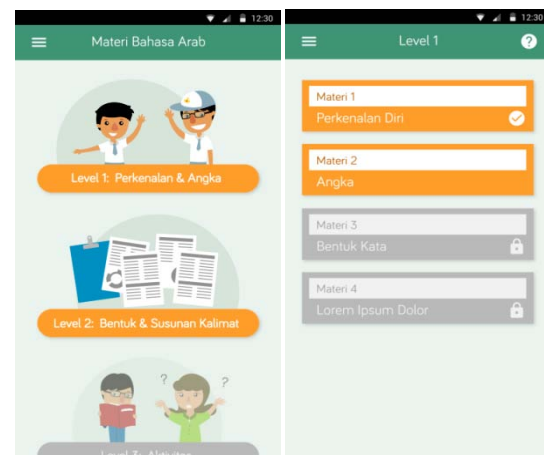


Fig. 7: Revisions of Arabic learning mobile application in terms of UI/UX

CONCLUSION

The good design of Arabic learning is to apply Arabic material that consists of vocabulary, grammar and tests. Arabic learning application must implement the method of Arabic learning such as the mim-mem method, the language control method, the phonetic method and the istimbath method. Arabic learning application should also utilize the concept of gamification and supporting features like audio, recording, examination and video. The evaluation shows that by implementing the method of Arabic learning with those features, users learn Arabic faster and easier and it also improves the user's engagement to the apps. Besides that, it is important to overlook UI and UX of the application to support user's attention and experience.

The research can still be undergone by performing another evaluation on the revision version and extending the set of data. The purpose is to see whether it can accommodate the previous evaluation or not and to give more accurate results. If it has a significant result than before, it shows that UI/UX aspects are important too in designing the application.

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