An Evaluation of Quran Memorization Mobile App among Middle-Aged Adults and Early Elderly

Siti Fatimah Abd Raof[1], Nor Azzyati Hashim[2]*, Noor Azura Zainuddin[3]

[1]Faculty of Computer & Mathematical Sciences,
Universiti Teknologi MARA, Perlis Branch, MALAYSIA

[2]Faculty of Computer & Mathematical Sciences,
Universiti Teknologi MARA, Perak Branch, Tapah Campus, MALAYSIA

[3]Academy of Contemporary Islamic Studies,
Universiti Teknologi MARA, Perlis Branch, MALAYSIA

*Corresponding author: *norazzyati@uitm.edu.my*
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ABSTRACT

There are many mobile applications that help to boost Quran memorization, but the target users are normally for general people without specifically consider the design for ageing people. This becomes imperative since ageing people need to face with the cognitive and physical decline as they are getting older.Hence, to enhance Quran memorization, a mobile app known as E-Hafazan was developed. For the interface design, the researchers integrated the mobile design guidelines for ageing people that comprise of seven categories: cognitive, content, navigation, visual, audio, perception and dexterity. The aims of this paper are to investigate the usability of mobile interface design and user acceptance on E-Hafazan mobile app for Quran memorization. A total of 30 people around Arau, Perlis participated in the system evaluation. The participants were in the category of middle-aged adults and early elderly, between the agesof 40-74 years old. From the findings, most of the respondents are satisfied with the E-Hafazan app sinceit is effective, interactive and ubiquitous for memorizing Al-Quran although there is a slight lack in the result of the visual category for the mobile interface design.

Keywords: *Quran memorization, mobile app, mobile design guidelines*

INTRODUCTION

The signs of cognitive and physical ageing start noticeable from the age of 40 (Lachman, Teshale & Agrigoroaei, 2014) and rapidly increasing after the age of 65 (Murman, 2015). The age group between 40 to 65 years old is labelled as the middle-aged adults (Levinson, 1986) while people in the age group of 65 to 74 is known as the early elderly (Orimo et. al., 2006). Most importantly, the role of spirituality becomes a vital element among ageing people (Koenig, George & Titus, 2004). Still, to achieve successful ageing life, positive spirituality indeed has a tight relationship with physical and mental abilities (Crowther et. al., 2002).

Muslims emphasis on the concept of "spiritual cleanliness" encompasses the relationship with God (Allah SWT), spiritual behaviours and beliefs through religious practices (Gall et. al., 2005).Muslims need to memorize the Al-Quran to preserve the Al-Quran and to seek many rewards that Allah SWT promises to give (Sedek et. al, 2013). Memorization of Al-Quran that is also known as *hafazan* is very important

especially to recite in prayers and daily life. Nevertheless, the time taken to memorize Al-Quran depends on the cognitive skills of the learners.

Traditionally, Muslims memorize by referring to Al-Quran, which a book called *mushaf*. As technology evolves, the technology can help to improve the way to memorize Al-Quran (Mohamad Marzuqi, 2008). When compared with the traditional method, Quran memorization can be done easier and faster with the use of smart phones and mobile applications which can help in enhancing memory(Nor Musliza&Mokmin,2014).Nonetheless, beginning in the middle age, the physical activity starts to weaken which includes decline in finger-tapping speed (University of California - Los Angeles, 2008).

Due to cognitive and physical decline with increasing in age, it becomes imperative to design and develop mobile app for the ageing people (Levdikova, 2017). Currently, there are many Al-Quran mobile apps being developed in the market (Nuril Ham Al Hafizah et. al., 2017) but many of them do not satisfy the need for ageing people to memorize Al-Quran.Accordingly, a mobile app that integrated mobile design guidelines for ageing people called *E-Hafazan* was developed. System testing was conducted on the usability of mobile interfaces and user acceptance of the *E-Hafazan* mobile appfor Quran memorization.

Mobile Design Guidelines for Quran Memorization App

E-Hafazan mobile app for Quran memorization adapted four different mobile design guidelines which created specifically to support the ageing people. Firstly and predominantly, the design guidelines followed the research by Silva, Holden and Jordan (2015) that designed a list of heuristics in evaluating smartphone apps targeted for older adults. Secondly, the design adapted a research on heuristics guidelines to help the elderly using smartphone/tablet by Carmein and Garzo (2011). Thirdly, the research from Barros, Leitão and Ribeiro (2013) about mobile user interface for the elderly from the perspectives of navigation, interaction and visual design. Lastly, the design also referred to the age-centered mobile design guidelines by Zaphiris, Ghiawadwala and Mughal (2005).Table 1shows the adapted mobile design guidelines for *E-Hafazan* mobile app that was adapted from the four researches.

Table 1: Mobile Design Guidelines for *E-Hafazan*Mobile App
(Adapted from Silva, Holden & Jordan, 2015; Carmein & Garzo, 2011; Barros Leitão& Ribeiro, 2013; Zaphiris, Ghiawadwala & Mughal, 2005)

Category	Design Guidelines on Mobile Interface
Cognitive	• All information needs to be in a page. • Avoid using interaction timeouts to memorize Al-Quran. • Avoid using fast-moving objects and animation.
Content	• Language must be simple, clear and adequate to users. • Information should be in the centre of the screen.
Navigation	• The buttons should be predictable. • Make home screen as the safe point to return. • Ensure user interface navigation structure is simple and straightforward.
Visual	• Use colour conservatively by limiting to not more than 4 colours. • Use simple, meaningful and relevant button/icon that clearly visible. • Use font size between 12 to 14 points.

	• Use serif or sans serif font type.
Audio	• Use male voice.
Perception	• Avoid using pure white or rapidly changing background.
Dexterity	• Avoid using double click. • Avoid using pull down menus and scrolling bar.

Figure 1: An example of *E-Hafazan* Mobile App Interface

Figure 1 illustrates an example of *E-Hafazan* mobile app interface. Besides adapting the mobile design guidelines, the cultural aspects need to be taken into consideration.Interestingly, cultural aspects can improve the effectiveness of interface design (Zan Azma & Husnayati, 2013). Therefore, *E-Hafazan*mobile app was developed using Malay language because it is the national language of Malaysia and the majority of the people is Malay Muslim. The meaning of each *ayah* in Malay language is also displayed in the app to help improves memorization. In addition, the use of repetition technique as the most preferred technique in memorizing Al-Qurancould help ageing people enhance their memory function (M. Hamiz et. al., 2014). The app enables users to choose replaying the *ayah* either one time, three times or five times.

METHODOLOGY

The participants that were involved in the system evaluation are selected randomly from the staffs in Universiti Teknologi MARA, Perlis branch and people that come to Masjid Arau, Perlis. There were 30 respondents ranging from 40 to 74 years old cooperated in answering questionnaires.Each questionnaire is divided into two sections: usability testing and user acceptance testing. The Likert scale questionnaire is measured between 1 (*Strongly Disagree*), 2 (*Moderately Disagree*), 3 (*Neutral*), 4 (Moderately *Agree*) and 5 (*Strongly Agree*). A brief interview session was also conducted with respondents if they answered 3, 4 or 5 scales to gain more detailed opinions from them.

FINDINGS AND DISCUSSION

Table 2: Results of Usability Testing

No.	Question	1	2	3	4	5	Mean
	Cognitive						
1.	I find that with each *ayah* (verse) in	-	-	-	22	8	4.3

	a page makes memorization easier.						
	Content						
2.	I find the language used is simple, clear and easy to understand.	-	-	-	2	28	4.9
3.	I find that all information is at the centre of the screen.	-	-	-	5	25	4.8
	Navigation						
4.	I find that the use of button is easy to understand.	-	-	6	17	7	4.0
5.	I find that the main page is the safe point to return.	-	-	2	6	22	4.7
	Visual						
6.	I find that the use of background colour with the colour of the font is suitable.	-	-	9	18	3	3.8
7.	I find that the position of the button and the link is clearly visible, consistent and easy to understand.	-	-	10	15	5	3.8
	Audio						
8.	I find that the male voice is very suitable and the pronunciation is clear.	-	-	7	17	6	4.0
	Perception						
9.	I find that there is no rapidly changing contrast background and the use of pure white background is avoided.	-	-	-	-	30	5.0
	Dexterity						
10.	I find that all the buttons only requires a single click.	-	-	-	5	25	4.8

Table 2 tabulates the results of usability testing on E-Hafazan mobile interfaces. Categories of design for cognitive, content, navigation, audio, perception and dexterity achieved good mean of 4.0 and above with all respondents answering only 4 (*Moderately Agree*) and 5 (*Strongly Agree*). The navigation category had respondents that answered 3 (*Neutral*) because they felt that the instructions were not clear on how to navigate from one page to another. For audio category, a number of respondents also answered 3 (*Neutral*). They said that the audio was too fast for them but satisfied with it since the *ayah* can be replayed. On the contrary, visual category attained mean below 4.0 with about one-third of the respondents answered 3 (*Neutral*). The respondents felt that the colours used were not suitable and attractive while some respondents were not able to see clearly some of the links. On the whole, the results from the categories demonstrate that E-*Hafazan* mobile app interface design is usable and suitable for the ageing people.

Table 3: Results ofUser Acceptance Testing

No.	Question	Mean
11.	I believe that the usage of E-Hafazan can assist me to memorize Al-Quran effectively.	4.2
12.	I find that the widely and popular use of	4.4

	smartphones encourage me to use E-Hafazan.	
13.	I find that E-Hafazan helps me to memorize more interactively.	4.5
14.	I feel easy to use E-Hafazan as memorization can be performed at anywhere and anytime.	4.5
15.	I find that the technique of repetition used in E-Hafazan is very effective.	4.3
16.	By using E-Hafazan, I can memorize more quickly and effectively.	4.3
17.	I am satisfied that using E-Hafazan eases me to memorize.	4.2
18.	I will use E-Hafazan again in the future.	4.4

The results of the questionnaire for user acceptance testing are as shown in Table3. All questions reach good mean of more than 4.0. The lowest mean is 4.2 for questions number 11and 17. This is followed by questions number 15 and 16 with mean of 4.3 while questions number 12 and 18 mean are both 4.4. Questions number 13 and 14 have the highest mean of 4.5indicate that *E-Hafazan* is more interactive and convenient to memorize at anywhere and anytime. Nonetheless, some respondents answered 3 (*Neutral*) scale for all questions except for questions number 12 and 14. For question number 17, two respondents answered scale of 2 (*Moderately disagree*) because they did not agree to use *E-Hafazan* mobile app and preferred the traditional method of memorization. Despite that, the majority of respondents found that *E-Hafazan* mobile app was effective to memorize Al-Quran and were satisfied to use the app.

CONCLUSION AND RECOMMENDATION

The necessity to design and develop mobile apps for ageing people becomes important in order to help them dealing with cognitive and physical decline in achieving positive spirituality like memorizing Al-Quran. The design of *E-Hafazan* app with consideration of cognitive, content, navigation, audio, perception and dexterity categorieshas shown that it is usable with some improvements need to be done in visual category.Other than that, the findings revealed that *E-Hafazan* app is effective, interactive, and ubiquitous as well as satisfy the need of middle-aged adults and early elderly to memorize Al-Quran.

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