

Providing a Digital Game-based Learning for Non-Native Arabic Speakers: A Need Analysis Study for the Development of Mobile Application Digital Game

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Abstract

Present studies have advocated the role of digital games in significantly enhance students' learning. In this regard, this paper examines the needs of digital mobile games in the development of Arabic language learning application. The data were collected using a need analysis questionnaire administered to 123 students enrolled in elementary Arabic language courses in three universities, Universiti Pendidikan Sultan Idris, Universiti Malaysia Kelantan, and International Islamic University Malaysia. The IBM SPSS Statistics 24 software was used to conduct descriptive quantitative analyses of the data collected. The results indicate that the digital game is an interactive tool which could create an exciting learning environment. The students highly agree on the use of digital games in the classroom and allow students to have fun and develop their creativity through digital game-based learning. Therefore, this paper reports the findings of the need analysis stage, regarding the use mobile device, the delivery and user interface, and the preferred features that could be embedded in digital game.

Keywords: Mobile Game Application, Mobile Learning, Gamification, Digital Game-Based Learning, Arabic Language, Need Analysis

Introduction

In this highly globalized world, the latest advances in technology have brought forward new innovative approaches that challenge the conventional approaches to language teaching and learning. Over the years, the advent of computer based learning and the internet has provided vast resources and opportunities for the use of innovative tool, approaches, and strategies for the teaching and learning of languages such as in teaching of Arabic as a second/foreign language. One effective platform which could optimize learning among digital natives is the use digital games. It has been recognized as a good learning tool as it could motivate students to become active participants in the teaching and learning process (Alessi & Trollip, 1984; Baid & Lambert, 2010; Kirikkaya, Iseri & Vurkaya, 2010; Sabri & Aziah, 2011; Hamizul & Rahimi, 2015). Past studies have shown that use of digital games could enhance student's knowledge, develop fun classroom environment, increase students' enjoyment through out the learning process and help develop of soft skills such as leadership and decision making (Paiva, Flores, Barbosa, & Ribeiro, 2016; Sung & Hwang, 2013; Hwang, Wu, & Chen, 2012; Najdi & Sheikh, 2012; Lee & Hammer, 2011; Yien, Hung, Hwang, & Lin, 2011; Papastergiou, 2009).

A study by (Abu Riya, 2001) found that the use of educational game can help students to develop the student thinking skill in addition to making learning enjoyable. Moreover, the use of such games help visualize information and subsequently, eliminate the burden of processing information presented by teachers. Moreover, the use of game-based learning, encourage students to try new things, take risks and not afraid of failure (Lee & Hammer, 2011). Another study by (Samir & Randa, 2012), mentioned that educational games improve learning skill as well as developing a positive inclination towards learning. Moreover, the study argued that the use of games could eliminate the stress that is often associated to the conventional learning process.

Digital educational games present a successful integration of multimedia elements for the purpose of learning (Mayer, 2001). Over the years, educational digital games have become more creative, innovative and dynamic The use of these games in teaching and learning has garnered considerable interests from different stakeholders in education. Scholars have advocated how games can be generally used to enhance second/foreign language learning outcomes such as helping students to better memorize vocabulary and meaning and modeling the pronunciation of second or foreign words (Marika et al., 2013). Furthermore, studies have discovered the potential of digital games as an interactive platform that encourages active learning and facilitate the development of critical thinking skills among second or foreign language learners. As a result, practioners and researchers are increasingly using digital game-based learning as part of their language teaching approaches and strategies.

It can be argued that the use of digital game-based in learning is still in infancy, particularly in the teaching and learning of Arabic language, (Sabri, 2011; Hamizul & Rahimi, 2015). In this light, due to the advancement of technologies in recent years, it has progressively gained much interest from researchers. Based on the above arguments, this paper discusses the advantages of using digital games as a platform to teaching Arabic language vocabulary. This study will look at how students perceive the use of digital game for learning Arabic via mobile devices, its delivery and user interface, and the students' preferred features and criteria that could be embedded into mobile games.

Background of Study

The teaching and learning of Arabic has been rooted for hundreds of years in Malaysia where Arabic teaching has continued to grow even in the 21st century. The cultural, economic and religious significance of Arabic have driven many Malaysians, particularly Muslims to learn the language. Consequently, Arabic language classes are being offered across different levels in the country. In the elementary level, Arabic is taught based on the Standard Arabic Curriculum for primary school pupils which focuses on mastery of the four language skills. Furthermore, in the tertiary level, there is an extensive offering of Arabic language programs or Arabic language subject by numerous public and private institutions of higher learning, with some of these institutions organization seminars and workshops to develop and improve Arabic language proficiency among students and teachers. The number of Arabic language learners in various levels has increased from time to time (Hanafi, et al., 2017).

In terms of second/foreign language learning, the acquisition of the target language skills is one of the most important criteria that contribute to the measurement of language proficiency for students. (Zunita, et al., 2016). However, despite the great effort to teach Arabic to students in schools, many of them still demonstrate a lack of mastery of the basic Arabic language skills. The students also lack the confidence to use the language beyond the classroom (Anida et al., 2013). Students' lack of proficiency has constantly become an issue of concern for teachers and researchers in Malaysia (Shukri et al., 2009; Hayyi et al., 2012). It is argued that the lack of students' Arabic language proficiency is caused by the fact that the students perceive that they only learn Arabic to pass the exam. Apart from that, studies also found that teachers tend to use less effective learning strategies.

The advent of modern technology as changed how we live. Modern technology is an integral part of our lives and many students rely heavily on technology to facilitate their daily work and affairs (MyMetro, 2015). The heavy reliance towards technology has created a new generation called 'digital natives' and scholars have advocated the use of technologies in learning to gauge the interest of the newer generation. It is argued that the integration of modern technology in the teaching and learning process could increase students' motivation to learn Arabic language and create an ownership of their own learning environment (Shahrizal et al., 2016). Undoubtedly, this creates an opportunity for teachers and researchers to explore, follow, track and update the use of technology in the current educational and learning landscape to keep in line with the rapid developments of modern technology.

As mentioned, children born in this new millennium are known as digital natives. The advances in technology have given students access to different preferences, tools and ways of processing and using information. However, scholars have criticized that how digital natives process information do not fit well with traditional educational practices (Helsper & Eynon, 2009) as traditional pedagogies can no longer use to teach the digital natives. This creates a need to change current pedagogies to make it in line with learning needs of digital natives. For instance, teachers need to change how their present information and communicate with their learners (Prensky, 2001). Furthermore, it was suggested that information should be presented in a more parallel, spontaneous way rather than through procedural, step by step way in conventional teaching. In this regard, one of the teaching method suggested us using computer games in the teaching and learning process.

Digital game-based learning is not a new approach in academic field and it has been increasingly used in the learning and teaching process. Digital games have been used in teaching various subjects like history (Azan, Azizah, & Wong, 2009), science (Nazirah et al., 2013), and chemistry (Najdi & Sheikh, 2012; Rastegarpour & Marashi, 2012). On the other

hand, the use of digital game-based learning in teaching Arabic language is still in its infancy (Sabri & Aziah, 2011; Hamizul & Shukri, 2015). This shows the need for adequate research in prove the effectiveness of digital games for the teaching and learning of Arabic language.

Research Objective

This main objective of this study is to present the initial step in on developing an educational mobile game application for helping students learn Arabic language vocabulary. This paper reports the findings obtained from the needs analysis stage, which is the first stage of the ADDIE design framework. Need analysis is conducted to probe how the students perceive the needs for using digital game and the criteria they want to be included in the game. The iterative phases in the ADDIE instructional framework is illustrated below.

The ADDIE Model is an iterative instructional design process, where the results of the formative evaluation of each phase may lead the instructional designer back to any previous phase.

The end product of one phase is the starting product of the next phase.

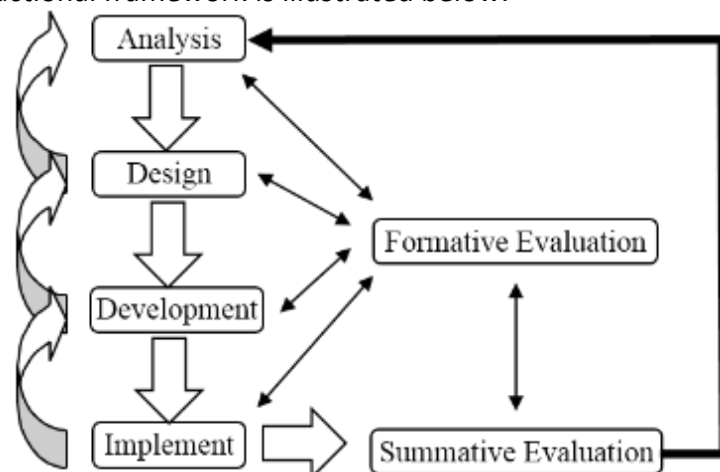


Figure 1: Iterative ADDIE Instructional Framework

Methodology

Research Sampling

The target sample comprises of undergraduate students who are taking Arabic language courses at tertiary level in three Malaysian universities, Universiti Pendidikan Sultan Idris, Universiti Malaysia Kelantan, and International Islamic University Malaysia, for the academic year of 2018/2019. 123 students who are non-native Arabic speakers took part in the needs analysis survey. Random purposive sampling was used to select the students who will participate in this research study.

Instrument

A need analysis survey was carried out by administering a set of questionnaire adapted from previous studies (Ghalib et al. 2016; Azan et al. 2009). The questionnaire is divided into 3 sections; Section A probes on the demographic background information of the participants while section B contains questions on the needs for digital game-based learning. Lastly, section C contains items on the preferred criteria for an educational digital game. The items in the questionnaire comprise of closed ended questions which use a 5 point Likert scale. The scales range from 1 = strongly disagree, 2 = disagree, 3 = partially agree, 4 = agree and 5 = strongly agree.

Data Analysis

Each questionnaire was examined to check whether the data are complete. The responses from the completed questionnaires were then keyed in into the data analysis software. The

data were categorized as student's demographic, need for digital game, and criteria of games for learning Arabic vocabulary using educational digital game. The descriptive statistics for the data were obtained through the *IBM SPSS Statistics 24* software. This results were then presented in three sections- students' demographic information, need for digital game and game criteria. The results and findings of every section are illustrated below.

Results and Finding

Demographic Background Information

Section a probes on the participants' demographic background information. These questions were included in the questionnaire to identify any similar pattern between the students who come from different backgrounds. The items probe on five demographic aspects - gender, institution, mother tongue, Arabic language background and student's preference of digital game-based learning. The results are tabulated in the table below:

Item	Sub-item	Frequency (N)	Percentage (%)
Gender	Male	40	32.5
	Female	83	67.5
	Total	123	100
Institution	IIUM	45	36.6
	UMK	47	38.2
	UPSI	31	25.2
	Total	123	100
Mother Tongue	Malay	84	68.3
	Mandarin	36	29.3
	Tamil	2	1.6
	Others	1	0.8
	Total	123	100
Arabic Language Background	Yes	66	53.7
	No	57	46.3
	Total	123	100
Preference of DGBL	Yes	116	94.3
	No	7	5.7
	Total	123	100

Table 1 Student's Demographic Background Information

Table 1 presents the demographic backgrounds of the students participating in this study. The results illustrate that 67.5% of the students are female while the remaining respondents (32.5%) are male students. All the students are non-native Arabic speakers and 36.6% are from IIUM, 38.2% are from UMK and the remaining 25.2% are from UPSI. 68.3% of the respondents are Malaysian students and Malay is their first language with. Meanwhile, the remaining 29.3% are international students originated from China with Mandarin as the first language, and 1.6% come from India and 0.8% from Australia with Tamil and English as their first language, respectively.

The participants come from a range of Arabic language background; 46.3% of the students never studied Arabic language before enrolling into their university, 53.7% have learned Arabic in their secondary school. The study also found that regardless of their language background, 94.3% of the students prefer their teachers to use new strategies in teaching Arabic vocabulary, such as by using digital games.

Need for Digital Game-based learning

Section B probes the students' needs for using digital game in the teaching and learning Arabic vocabulary. The mean value (M) and standard deviation (SD) obtained from the analysis are presented in the table below. According to Oxford (1990) classification, mean score ranging from 3.5 - 5.0 reflect a high level of agreement, mean ranging between 2.5 - 3.4 reflect medium level of agreement and the means between 1.0 - 2.4 reflect low level of agreement.

Item	Mean	SD
1 I need an interactive learning tool to learn Arabic vocabulary.	4.50	0.534
2 I need challenges in learning Arabic vocabulary.	3.80	0.778
3 I need an exciting environment in learning Arabic vocabulary.	4.49	0.518
4 I play games because it is fun.	4.59	0.510
5 I play games because it is a calming thought.	4.46	0.562
6 Games help me in increasing my creativity.	4.51	0.534

Table 2 Relevancy of Digital Game

The table above illustrates the relevancy of adopting digital games in the Arabic language classrooms. The results indicate that the participants highly agree on the use of digital games in the classroom. They believe that students need an interactive learning tool in learning Arabic (M=4.50). At the same time, also need an exciting environment for learning Arabic (M=4.49). However, due to the difficulties they face in learning Arabic, only some of them are aware of the challenges they face in the Arabic language learning process (M=3.80). In the meantime, most of the participants think that including games into the classroom will create a fun learning environment (M=4.59). They also believe that games are calming and could reduce stress. (M=4.46) and playing games will help them to become more creative (M=4.51). In this regards, the employment of digital game in Arabic classroom is relevant and in line with the students' needs in learning Arabic vocabulary. Based on these findings, it can conclude that digital game is an interactive tool which could create an exciting learning environment. However, it is important to note that games used to have minimal element of challenges to allow students to have fun and develop their creativity through digital game-based learning.

Game's Criteria

Section C collects data about the ideal criteria of an educational digital game. There are two main construct in this section, the first construct explores the student's' experiences and inclination of playing digital games. The second construct is the ideal criteria for a game that should be included in the development of a digital game. The frequency (N), percentage (%), mean value (M), and standard deviation (SD) are reported in the table below. According to Oxford's (1990) classification, mean scores ranging between 3.5 - 5.0 for each item is thought to reflect the high level of agreement, a mean within the range of 2.5 - 3.4 reflects the

moderate level of agreement and the mean score between 1.0 - 2.4 reflects low level of agreement.

Item	Sub-item	N	%
Operating System	Android	89	72.4
	Apple iOS	31	25.2
	Windows	3	2.40
	Blackberry	0	0
	Others	0	0
	Total	123	100
Internet Accessibility	Wifi	102	82.9
	Broadband (3G/LTE)	16	13.0
	Hotspot	5	4.1
	High-speed broadband	0	0
	Others	0	0
	Total	123	100
Reason for having mobile devices	Communication	93	75.6
	Education	24	19.5
	Entertainment	5	4.1
	Collaboration	1	0.8
	Business	0	0
	Others	0	0
	Total	123	100
Frequency of playing digital games	<1 hour/ week	17	13.8
	1 hour/ week	12	9.8
	2 hours/ week	10	8.1
	3 hours/ week	31	25.2
	4 hours/ week	14	11.4
	>4 hours/ week	39	31.7
	Total	123	100
Platform for playing digital game	TV	6	4.9
	PC	7	5.7
	Games handheld	4	3.3
	Mobile	106	86.2
	Total	123	100

Table 3 Student's Demographic on Digital Game

The table above demonstrates that 72.4% of participants use Android based devices and mobile phones, while 25.2% of them use the Apple iPhones. Only 2.4% of the participants use devices with Windows operating system. The high use of Android based mobile phones can be attributed to their cheap and competitive price in the market. Furthermore, most of the participants access the internet through their university campus Wi-Fi facility (82.9%), which indicates the participants' high dependence of the university's on-campus Wi-Fi service

to access the internet. Only 13% of students subscribe to broadband services (3G/LTE) as they have limited access to the university Wi-Fi service in certain campuses. Besides, the results indicate that 75.6% of the students stated they mainly use their mobile devices for communication, followed by education purposes (19.5%), entertainment (4.1%), and collaboration (0.8%).

The participants were also asked about the time they spend playing digital games per week. 31.7% of them spend more than four hours per week playing digital game. This is followed by three hours per week (25.2%), less than one hour per week (13.8%), four hours per week (11.4%), one hour per week (9.8%) and two hours per week (8.1%). In addition, the majority of students play digital game using their mobile phones (86.2%) followed by computer (5.7%) and game consoles such as the *Sony Playstation®* (4.9%). Only 3.3% of the students use handheld devices such as *Sony PSP* and *Nintendo Game Boy*. Most use mobile phone to play digital games as android and iOS mobile digital games are often free to download from the *Google Play Store* or the *Apple App store*.

Item	Mean	SD
1 I prefer the navigation of the game using page flipping.	3.64	0.737
2 I prefer the navigation of the game using previous and next button.	4.22	0.521
3 I prefer the navigation of the game using scroll up and down.	3.93	0.744
4 I prefer the main menu in the form of list of icons only.	3.60	0.875
5 I prefer the main menu in the form of list of words only.	4.31	0.530
6 I prefer the main menu in the form of both of icon and words.	4.56	0.498
7 I prefer to have the game designed for mobile phone.	4.49	0.518
8 I prefer to have the game designed for tablet.	3.91	0.975
9 I prefer to have the game designed for computer.	3.64	1.072
10 I prefer the language interface to be in Arabic.	3.65	0.878
11 I prefer the language interface to be in English	4.59	0.493
12 I prefer the language interface to be in Malay.	3.46	1.010
13 Literal meaning of the vocabulary.	4.02	0.830
14 Arabic transliteration of the vocabulary.	4.62	0.488
15 Vocabulary properties	4.18	0.779
16 Arabic script of the vocabulary.	4.59	0.495
17 Audio pronunciation of the vocabulary.	4.65	0.479
18 Games are arranged topically.	4.20	0.826
19 Game tutorial.	4.15	0.859

Table 4 Game Criteria Needed

Table 4 presents the survey result on the game criteria that are deemed as important by the participants. The criteria mentioned in the survey include content navigation, the main menu design, the delivery platform, the language interface, the multimedia elements, and the language content. The navigation of the game using previous and next button is highly preferred by the majority of the participants with the mean value of 4.22. Meanwhile, only a handful prefer the main menu to be a combination of both icons and their description (M=4.56). A majority of the students also prefer for the game to be designed for mobile phone (M=4.49) since they own a mobile phone and it will be easier for them to access the digital game through their mobile phones. In term of language used in interface, the participants highly prefer English (M=4.59). This might be because the majority of the games available

nowadays use English as their main language and the participants are familiar with the English terms used in the games.

The participants were also asked to rate the features they want in the digital game. The feature with the highest requests is including the audio pronunciation of the vocabulary with the mean value 4.65, followed by providing the Arabic transliteration (M=4.62) and Arabic script of the vocabulary (M=4.59). The transliteration function will help students read the vocabulary as audio clips modeling the pronunciation of the vocabulary are provided. The next feature is the arrangement of the game where the participants requested that the games are arranged topically (M=4.20) as it could help them understand the lesson better. The next important feature is vocabulary properties (verb, noun, adjective) (M=4.18) and game tutorial with the mean value of 4.15.

Discussion

The results of this study's need analysis survey have several implications. It highlights several issues that need to be addressed by the designers prior to developing the application. The survey reported students' readiness and current use of technology. The items probed on information including the type of devices they use, the level of internet accessibility, reason for having mobile device, frequency of using digital games and platform they use to play digital games. These results provided inputs for the step by step development of educational digital game for learning Arabic vocabulary. According to the survey, 72.4% of the students are using Android based mobile devices, as opposed to iOS based and other platforms. Moreover, 86.2% of the participants access and play digital games through their mobile devices, hence, an android based mobile game application could reach a wider audience. The designer should also consider designing a digital game that can be accessed offline since the majority of the participants rely on Wi-Fi facility in their university campus, which at times could be limited in some areas.

The digital game features Arabic script and Romanized translation of Arab characters. Furthermore, the games interface combines the literal meaning of words, multimedia elements, and vocabulary properties to enhance students' understanding. A tutorial for playing the game is also included. The digital game visualizes and simplifies the Arabic vocabulary to address the challenges faced by students in learning the language since they are at elementary level. The contents of the application are catered to meet the students' need and to gauge their interest for learning Arabic. Inputs for improvements such as changing the font type and size, improving quality of multimedia elements, and simplifying the user interface can be considered will be considered in the development process.

Conclusion

This paper presents the findings of needs analysis study as part of the development of an educational mobile game application for Arabic language learning. As shown, scholars have advocated the benefits of using digital mobile game application in learning as it can engage students in the learning process, improve their achievement and increase their motivation towards learning the subject. The lack of such innovative tool used in learning Arabic language justifies its development. Students' needs and preferences are being taken account in the development process of mobile game application. In this light, the need analysis process makes the design of the mobile game application more unique and different from any other mobile game available in the market as the process ensures that the application can address the specific needs of the users. In this regard, the ADDIE development framework highlights the significance of considering users' need and the relevancy of such application for their

learning process. This is to ensure that the mobile game design have the integrated features and criteria suggested and preferred by the students. Consequently, the needs analysis of mobile game application could provide significant inputs and help disseminate precious knowledge on how to design and engaging and enjoyable mobile application for effective learning.

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