



# Developing Augmented Reality Application in Teaching Arabic Vocabularies: Analysis of KAFA Arabic Teachers' Need

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4619

## Abstract

In recent years, augmented reality utilisation in education has been on the rise to improve pedagogical approach, including at the primary level. However, there is a lack of research and employment of this technology in Quranic and *Fardhu Ain Class (KAFA)* institution. Therefore, this study aimed to identify the major issues faced by KAFA educators in teaching the Arabic vocabulary, including their expectations and suggestions towards the use of augmented reality technology in Arabic lessons. A set of need analysis survey was randomly distributed to 260 KAFA Arabic teachers in Kelantan. The findings showed that the respondents encountered major issues on the limited technological tools for teaching and learning facilities provided for KAFA classes. Besides, the results indicated the challenges students face in mastering the Arabic language since their resources are limited to textbooks and rote learning and consulting their teachers and friends in defining unfamiliar words. Furthermore, the findings show a crucial need for an augmented reality application among KAFA Arabic teachers equipped with audio visuals to enhance students' understanding of selected Arabic vocabularies in the Arabic KAFA syllabus. Most importantly, they are keen on adopting this application in the teaching and learning process to increase students' motivation and attention to master the Arabic vocabularies by providing an advanced and interactive learning environment.

**Keywords:** Augmented Reality, KAFA, Arabic language, Vocabularies, Teaching and learning.

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## 1. Introduction

Ever since the establishment of KAFA (Quranic and *Fardhu Ain Class*) under the Department of Islamic Development of Malaysia (JAKIM) in 1990, the Arabic language subject or *Lughatul Quran* (Quranic language) has become one of the compulsory subjects taught at KAFA schools across all states in Malaysia (Rasdi et al., n.d.). The curriculum development under KAFA is slightly different from its conventional counterpart under the Ministry of Education. The objectives

listed in KAFA guidelines stated that all KAFA subjects aim to empower the basic Islamic education apart from mastering the Al-Quran and *Fardhu Ain* (Garis Panduan KAFA, 2006).

Currently, the traditional verbal teaching and learning system is still preferred despite decreasing effectiveness (Mayer, 2003). Opting for a single teaching method and materials is quickly losing its relevance for impactful education, resulting in the loss of interest among students due to their diverse learning styles and



abilities (Esa et al., 2007). Thus, researchers and educators must establish a new, relevant approach to enhance teachers and students teaching and learning experience (Samah, 2012).

An interesting and interactive teaching and learning process using multimedia is essential for students to master the Arabic language, especially for non-native children at the primary school level (Amiruddin et al., 2017). Nevertheless, the utilisation of technology, which has begun since introducing computer-based teaching and learning, should be further developed and optimised to benefit students (Zainuddin, 2014). Augmented reality technology is one of the growing multimedia platforms that has been and currently used in various fields, including education. In regards to Arabic language education, this learning tool can help students hone the skill in a more effective environment. Furthermore, it improves students' motivation, usability, involvement and enjoyment in their learning process while culminating their interest in a particular subject (Gopalan et al., 2015).

According to Scrivner and Madewell (2016), augmented reality is suitable for language teaching, especially foreign languages, in improving their skills and performance because they can imitate the pronunciation apart from gaining new and meaningful experiences. Moreover, other tools in their surrounding can be integrated with the technology, such as textbooks, flashcards, and boards and markers. The benefits and efficacy of integrating augmented reality technology in the education system are unquestionable (Kesim & Ozarslan, 2012). Its advantages are evident, especially as a means to explain complex concepts by making information transfer more realistic (Majid et al., 2015) and creating a more active and interactive learning environment for students (Nischelwitzer et al., 2007). Thus, it is clear that augmented reality is an important multimedia platform to build students' knowledge and understanding through the teaching and learning contents in real-time environment.

### **Augmented Reality and Arabic Language Teaching & Learning**

Augmented reality in teaching and learning Arabic is widely practiced to provide

better experience for teachers and learners at various Arabic language education levels (Al-Hassan et al., 2020). For instance, Hashim et al. (2017) developed learning and exercise modules with multiple multimedia elements such as 3D objects, video, audio and graphics to help students learn quickly in early Arabic language education. As a result, students showed high interest to learn more interactively through augmented reality application.

In the initial stages of Arabic language education, the main focus is to introduce and familiarise the students with the Arabic alphabets. Munsyi & Aljojo (2020) successfully developed an Arabic alphabet augmented reality application for children (3 to 5 years), which supported the theory that multimedia platforms that include graphics, animation, videos, and 3D object enhance their language skills. Additionally, Elgamal et al. (2018) and Daud et al. (2021) explained that augmented reality helps students learn the Arabic language effectively by transforming their learning process from the memorisation routine to a journey of discovery via active learning. However, the utilisation of multimedia platforms like augmented reality technology at the primary school level has its challenges, often due to the lack of IT facilities and skills among teachers. Therefore, these issues must be addressed to support the modern-day teaching and learning of the Arabic language involving the latest technology (Alkhattabi, 2017).

### **2. Problem Statement**

Mastering the Arabic vocabulary is a critical problem that needs to be tackled at an early stage, such as the primary school level (Abdul Ghani et al., 2022; Rahim, 2009). In addition, the availability of teaching aids remains scarce and far from achieving its goal of improving the quality of teaching and learning at KAFA schools. On top of that, the teaching materials at KAFA schools are in dire need of an upgrade, parallel with the constantly progressing lives of students living in a digital era (Bani Hidayat & Nor Hayati, 2016).

However, choosing a multimedia platform courseware as a teaching aid, quality and suitability are the main aspects that need emphasis. Previous studies found that some multimedia courseware products available in the



market were not developed according to the teaching needs and appropriate specifications (Zainuddin&Sahrir, 2015; Siti Nazirah, 2016). Thus, the needs of KAFA Arabic teachers as users of the teaching materials and someone familiar with students' learning environment should be taken into account to produce quality and appropriate courseware.

### 3. Research Objectives

The research objectives of this study are as follows:

- 1) To identify KAFA Arabic teachers' experience in using multimedia especially augmented reality technology
- 2) To investigate the issues and challenges faced by KAFA Arabic teachers on the use of multimedia at KAFA Schools
- 3) To explore KAFA Arabic teachers' suggestions on the use of augmented reality application for teaching Arabic at KAFA Schools

### 4. Methodology

This quantitative research employed a structured survey through a questionnaire as an instrument in this need analysis study. A 10-point scale questionnaire was used to measure KAFA Arabic teachers' perceptions and needs towards the development of augmented reality application in teaching KAFA Arabic vocabularies at KAFA schools. The questionnaire was established based on four main parts, part A (demographic information), part B (KAFA Arabic teachers' experience in using multimedia), part C (issues and challenges faced by KAFA Arabic teachers on the use of multimedia at KAFA school) and part D (KAFA Arabic teachers' perceptions and suggestions towards the use of augmented reality in teaching KAFA Arabic vocabularies in term of

feature, usability, syllabus and preferred multimedia elements).

The items for this questionnaire were adapted from Zainuddin (2014) and Nawi (2014), which consisted of both Likert-scale closed-ended and open-ended questions, including additional suggestions and ideas for teaching Arabic vocabularies using the augmented reality application. Among 1100 KAFA Arabic teachers in Kelantan, 285 respondents were selected based on Krejcie & Morgan (1970) to answer the questionnaire. The respondents were selected randomly from 316 KAFA schools in various districts in Kelantan. Additionally, this study adopted the descriptive quantitative approach to analyse the collected data by using IBM SPSS statistical software to describe and explain the current situation of respondents besides understanding their issues and needs for the future practice of suggested platform for teaching and learning (Jailani et al., 2020).

### 5. Findings and Discussions

This study aimed to discover KAFA Arabic teachers' needs in Kelantan to create an augmented reality multimedia application in teaching Arabic vocabularies at KAFA institutions. During this study, descriptive quantitative data collection procedures were conducted for the need analysis process. Then, the findings were divided into four different categories; 1) Demographic information, 2) KAFA Arabic teachers' experience in using multimedia, 3) Problems involving the usage of multimedia among Arabic teachers at KAFA school & 4) KAFA Arabic teachers' perceptions and suggestions regarding the integration of augmented reality in KAFA Arabic vocabularies lessons. The findings were as follows:

#### 5.1 Demographic Background

No	Demographic Background	Frequency (N)	Percentage (%)	
1	Gender	Male	76	26.7
		Female	211	74
2	Age	<25	31	10.9
		26-30	62	21.8
		31-35	64	22.5
		36-40	44	15.4
		>40	85	29.8
3	Experience in teaching Arabic	1-4 years	116	40.7



		5-10 years	113	39.6
		>11 years	56	19.6
4	Experience in using mobile device to run multimedia (Text/ Audio/ Graphic/ Video/ Animation)	Yes	198	69.5
		No	87	30.5
5	Experience in using multimedia elements as a teaching aid	Yes	98	34.4
		No	187	65.6

Table 1: Demographic Background

A total of 285 KAFA Arabic teachers in Kelantan participated in this study, where 74% were female, and the rest are male (26.7%). Most respondents were >40 years of age (29.8%), followed by 31-35 (22.5%), 26-30 (21.8%), 36-40 (15.4%) and <25 (10.9%). Besides, the majority of the respondents have 1-4 years of experience (40.7%), followed by 5-10 years (39.6%), and few have been teaching Arabic for more than 11 years (19.6%). Furthermore, most of them have this experience (69.5%) in handling mobile devices to run multimedia (text, audio, graphic, video or animation), whereas 30.5% were

not familiar with this. However, the majority (65.6%) were not familiar with multimedia usage as a teaching aid, compared to 34.3% who were experienced.

### 5.2 KAFA Arabic teachers' experience in using multimedia especially Augmented Reality

4622

It is essential to know the extent of experience in using multimedia, especially augmented reality, among KAFA Arabic teachers to gauge their understanding and skills in using multimedia platforms, as illustrated in Table 2.

No.	Experience in using multimedia, especially multimedia augmented reality	Percentage %	
		Yes	No
1	I have experience in using a mobile device to prepare teaching aids for Arabic teaching and learning	52.1	47.9
2	I have experience in using multimedia as a teaching aid for Arabic teaching and learning	46.6	53.4
3	I know about multimedia augmented reality technology	33.8	66.2
4	I have seen the use of multimedia augmented reality before	32.8	67.2
5	I have experience in using augmented reality	11	89
6	I have experience in using augmented reality during Arabic vocabularies teaching and learning	6.6	93.4

Table 2: Experience in using multimedia especially Augmented Reality

Based on Table 2, more than half of the KAFA Arabic teachers (52.1%) were experienced mobile device users in preparing teaching aids for Arabic lessons, while the other half (47.9%) were new to the technology. Conversely, less than half of the teachers have used multimedia as a teaching aid, whereas 53.4% claimed they did not have the experience. Meanwhile, 33.8% of the respondents were aware of the augmented reality technology, but most of them (66.2%) did not know about this multimedia platform. Furthermore, only 32.8% had seen the

use of augmented reality, whereas 67.2% were unfamiliar with how this technology functions. This finding explains the minimal exposure of KAFA Arabic teachers in using augmented reality, which is only about 11%, and the remaining 89% had no experience in using augmented reality. Specifically, very few of them (6.6%) were experienced using augmented reality in their Arabic lessons, while the rest (93.4%) have never used the technology during teaching and learning.



### 5.3 Current Issues and Challenges Faced by KAFA Arabic Teachers on the Use of Multimedia at KAFA Schools

Table 3 explains the current issues and challenges faced by KAFA Arabic teachers on the use of multimedia at KAFA schools; thus, reflecting the gap that needs to be filled in their current teaching and learning process at KAFA schools.

No.	Current issues and challenges faced by KAFA Arabic teachers on the use of multimedia at KAFA Schools	Percentage (%)
1	My students have difficulty remembering the meaning of some Arabic vocabularies	72.4
2	My students are less interested in learning Arabic vocabularies	35.5
3	I did not practice various activities during Arabic vocabularies teaching and learning	41
4	I lack exposure to various teaching activities during Arabic vocabularies teaching and learning	52.1
5	Facilities provided in schools are limited (Ex: No technological tools/ devices are provided in the classroom to be used during teaching and learning)	77.6
6	I only focus on the use of textbooks for teaching Arabic vocabularies	57.2

4623

Table 3: Current issues and challenges faced by KAFA Arabic teachers on the use of multimedia at KAFA Schools

KAFA Arabic teachers face some issues and challenges to integrate multimedia into teaching Arabic vocabularies among KAFA students. The most common issue faced by KAFA Arabic teachers is limited facilities provided at KAFA schools, such as no technological tools or devices to be used during the teaching and learning process (77.6%). Secondly, their students have difficulty memorising the meaning of some Arabic vocabularies (72.4%). Thirdly, they only focus on using textbooks to teach KAFA Arabic vocabularies (57.2%), followed by the lack of exposure to various teaching activities during Arabic vocabularies teaching and learning (52.1%), the lack of activities involved in Arabic vocabularies teaching and learning (41%), and lastly, their students lacked interest in learning the Arabic

vocabularies (35.5%). These predicaments proved that there is a serious gap that needs to be filled among KAFA Arabic teachers in teaching KAFA Arabic vocabularies

### 5.4 Suggestions on the Development of Augmented Reality Application for Teaching Arabic at KAFA Schools

It is important to identify the needs of KAFA Arabic teachers and the multimedia elements required to develop an augmented reality application for teaching KAFA Arabic vocabularies, which include content and technical concepts relevant to the subjects.

No.	Item	Min
1	Augmented reality application should be easy to use	8.43
2	Augmented reality application requires the use of visual/ image element	8.23
3	Augmented reality application requires the use of audio/ sound element	8.27
4	The Arabic vocabulary used in the augmented reality application should be selected from the KAFA textbook syllabus	8.53
5	I need a clear guideline on the use of augmented reality application in teaching Arabic vocabularies.	8.63
6	Arabic Vocabularies T&L assisted by augmented reality application should be given a certain period during Arabic class.	8.37



7	Augmented reality application can be used in the current activity segment of Arabic Vocabularies T&L	8.37
8	Interactions between students and teachers are still needed while conducting the activity segment of T&L Arabic vocabularies through augmented reality application	8.45

Table 4: Suggestions on the development of Augmented Reality application for teaching Arabic at KAFA Schools

The questionnaire items were evaluated using a 10-point scale through min value to measure KAFA Arabic teachers' need for teaching KAFA Arabic vocabularies using the augmented reality application (Table 4). All items indicated a high need of these KAFA Arabic teachers in utilising the multimedia platform in teaching KAFA Arabic vocabularies that is easy to use (8.43) with two main multimedia elements; visual/image (8.23) and audio/sound (8.27). Furthermore, they preferred the content to be selected from the KAFA Arabic vocabularies in the KAFA Arabic textbook syllabus (8.53). Besides, a clear guideline in teaching KAFA Arabic vocabularies is vital to assist teachers in handling the application (8.63).

In terms of augmented reality application usage, the majority of KAFA Arabic teachers agreed that a certain period should be allocated for this application during Arabic class (8.37) and can be used in the current activity segment of Arabic vocabularies (8.37). However, they did not deny the importance of teacher-student interactions and communication during lessons while using augmented reality application (8.45). In addition to these elements needed to develop the technology, additional suggestion in creating an augmented reality application for Arabic teaching and learning at KAFA schools was also identified (Table 5).

4624

No	Suggestion from respondent	Suggestions
1	Saya bersetujuan dengan penggunaan teknologi augmented reality untuk meningkatkan logika dan pengajaran bahasa Arab di kelas KAFA	AR application is needed as a platform to vary KAFA Arabic teaching methods in class
2	Meningkatkan pendedahan teknologi augmented reality untuk guru dan pelajar	More exposure to augmented reality technology for teachers and students
3	Pembelajaran dan pemudahcaraan (PdPc) kosa kata Bahasa Arab berbantuan teknologi Augmentasi Realiti per lumelibatkan kos yang rendah	The teaching of Arabic vocabularies using augmented reality application





4	Perlu digunakan muzik latar yang sesuai bagi memudahkan ingatan	should be low cost Using suitable background music for students' memory retention
5	Penyediaan bahan seperti menggunakan Augmentasi Realiti dapat disediakan supaya pelajar dapat menggunakannya dalam kumpulan "flashcard" yang	The use of flashcards along with the augmented reality application for students to use in groups

Table 5: Additional suggestions in establishing the augmented reality application for Arabic teaching and learning at KAFA Schools

Besides the need for KAFA Arabic teachers on augmented reality application, some teachers suggested it as a platform to vary current teaching and learning methods and pedagogy in KAFA classes. Apart from that, the respondents highlighted the need for exposure in using the augmented reality to familiarise themselves and their students with this technology, which should also be low cost to promote its usage. Moreover, the inclusion of suitable background music in the application was also recommended to improve students' understanding and ease the memorisation of the vocabularies. Lastly, it was suggested that flashcards should be included as markers for augmented reality for students to work in groups.

**6. Conclusion**

In this study, a need analysis was conducted among KAFA Arabic teachers as a guideline in establishing an augmented reality application and its utilisation in teaching KAFA Arabic vocabularies. The respondents have confirmed their usage of multimedia technology, and some had experience in using augmented reality. Several problems and challenges in using augmented reality application at KAFA schools were identified and divided into

three main categories: 1) Technical factor related to limited facilities provided at KAFA schools, 2) Teaching method factors, and 3) Students' factor in terms of their interest and ability to memorise KAFA Arabic vocabularies. These findings represent the gap that needs to be filled to assist KAFA Arabic teachers in teaching Arabic vocabularies at KAFA schools using the augmented reality application. Overall finding manifest positive feedback among the respondents from KAFA Arabic teachers regarding their needs, including the elements of multimedia needed, how the augmented reality application should be used in the teaching and learning process, and the preferred marker platform to be used together with the application. Based on the results of this study, a few recommendations were made, such as the inclusion of multimedia elements such as visual or image from the listed vocabularies to improve students' understanding together with the audio or sound for characters and vocabulary pronunciation. In summary, the integration of augmented reality application according to the needs of KAFA Arabic teachers is essential to enhance the teaching and learning of KAFA Arabic vocabularies at KAFA schools.

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