

# Developing Virtual Reality (VR) Technology in Learning Arabic Grammar: An Insight on Needs Analysis for Arabic-VR Application

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## Abstract

The learning of Arabic grammar – which uses textbooks with lengthy details can be transformed into creative and innovative forms through the application of technological advancement. Worldwide educators from diverse backgrounds and cultures are well equipped with the recent teaching methods and tools which are widely used and accessible to guide and nurture the students in a productive and interactive classroom learning environment. Significant studies have indicated that Virtual Reality (VR) is one of the many technological applications for facilitating learning. It is an emerging technology undergoing a rapid transformation in the educational world. However, there is still limited study about the use of VR in Malaysia for teaching and learning a foreign language i.e. Arabic. The usage of this technology has been less explored, particularly from the perspective of students at the university level. Generally, this study employed the Design and Development Research (DDR) approach, and in the first phase of DDR i.e. the needs analysis phase. This phase used a questionnaire on the needs in developing the Arabic-VR Application. Therefore, this study aims to gather students’ perspectives about their needs in developing the Arabic-VR Application using VR technology in learning Arabic grammar. The questionnaire was distributed conveniently to 150 students of various programs at Kolej Universiti Islam Perlis (KUIPs), who took Arabic Language (subject code: DTU2022) as a compulsory subject at the Centre for Languages and General Studies, KUIPs in semester 1, session 2023/2024 of the academic calendar. Quantitative data were then analyzed using the Statistical Package for Social Science (SPSS) application to retrieve frequency distribution, percentages, mean, and standard deviations. The results show a high need to develop the Arabic-VR application for learning Arabic grammar. Findings revealed that there is a positive response to adopting technological tools i.e. VR for language learning as it was positively perceived to increase students’ motivation towards learning Arabic grammar. It is hoped that the findings of this study could benefit the readers and be used as a benchmark for the use of VR in learning Arabic grammar.

**Keywords:** Virtual Reality (VR), Arabic grammar, needs analysis, learning

## 1.0 Introduction

The objective of learning a language approach is to practice language proficiency without making mistakes (Abdul Hamid et al., 2020). Similar to Arabic, teaching and learning (TnL) places a strong emphasis on grammatical acquisition. Abdul Karim et al. (2020) claimed that every language in the world, notably Arabic, is highly concerned

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with grammar to guarantee that the language is utilized correctly and accurately. Arabic grammar is a method of preserving speech and correct pronunciation and writing. It is not an intended goal, but rather one of the methods that helps learners speak and write in the proper language (Al-Dalimi, 2005). According to Jaffar & Sha'ari, (2016), the grammar that serves as the foundation for the Arabic language's rules determines whether or not the Arabic language will serve its intended purpose.

According to Syed Ab Hamid et al., (2017), the weakness of mastery of the Arabic language as a whole is the result of failing to understand grammar well. At the same time, the TnL method of Arabic grammar still focuses on the explanation of the textbook by the teacher and involves less two-way interaction. This is not in line with current developments, especially for Generation Z students who prefer interactive learning, innovation, and a variety of technology-based teaching aids. Zaini et al., (2019) pointed out that one factor contributing to this issue is the TnL methodology of Arabic grammar, which is synonymous with method and incorporates teacher-centered learning. Husin et al., (2017) added that due to teaching methods that are sometimes unfocused and stagnant, particularly for non-native students who adhere to traditional and static learning styles, the discussion surrounding Arabic grammar is very broad. Sjahrony et al., (2017) also claimed that Arabic textbooks are filled with in-depth information that is given in the form of lengthy descriptions, which causes the content to be disorganized. This circumstance adds to the students' disinterest in studying the book's material further. As a result, the part that instructional materials perform is crucial in clarifying and improving learning measurement.

In this advanced era, language or linguistic learning using technological and technical innovations has become necessary and important. Although the natural characteristics of the Arabic grammar method are complex, it does not mean that mastery of it is limited. Various teaching methodologies in TnL Arabic grammar have been practiced by teachers. However, the selection of a creative and appropriate approach needs to be widely practiced in line with current technological developments. This can impact TnL activities in addition to achieving the desired objectives (Ismail et al., 2018). Jamaluddin & Baharuddin (2021) pointed out that diverse learning methods and the use of learning aids that suit the student's ability need to be considered. An interactive and innovative teaching approach is more suitable and popular with students in this current era as compared to traditional methods that only focus on the teacher. One of the alternatives in practicing the approach is by using multimedia that acts as a teaching aid (Sallehin & Ab Halim, 2018). The use of multimedia can be practiced through the presentation of information through Virtual Reality (VR) technology. Today, the use of VR technology in its various types and features has become widespread in all parts of the world and various fields, including the field of education. Information is presented in an interactive, colorful, three-dimensional, full of animation, and sound effects environment. According to Shen (2017), VR technology has become one of the most popular tools for teaching and learning activities in various fields. Hence, the current researchers believe that nowadays the use of VR technology is one of the modern educational methods that should be implemented and not be ignored in the TnL process.

Based on the current situation mentioned before and taking into consideration the importance of using VR technology in the field of TnL, in this paper, the current researchers are prompted to introduce and develop an Android smartphone application for educational learning played on a VR console as a new learning tool called the Arabic-VR Application. This application is based on VR technology. The person who uses VR equipment will be able to "look around" the artificial world, move around it, and interact with virtual features or items. The effect is created using a head-mounted VR device which has a screen in front of the eyes. This application aims to increase students' motivation towards learning Arabic grammar in an interactive, colorful, three-dimensional, full of animation, and sound effects environment.

## **2.0 Virtual Reality (VR) Technology and Learning-Teaching Arabic Grammar**

VR is an artificial environment that is presented to the user as a three-dimensional (3D) view which creates the illusion of being inside that environment instead of looking at a normal image (Sweidan, S.Z. et al., 2018). To generate a realistic feeling, VR is created on a computer targeting two senses; sight and sound in combination with physical spaces and multi-projected environments to simulate a physical presence in an imaginary environment (Sweidan, S.Z. et al., 2018).

The importance of VR technology has remarkably increased in the last few years. It is widely practiced in various fields, including the field of education (Shen, 2017). For instance, Sweidan, S.Z. et al., (2018) experimented by developing a VR application called VREG to provide a better experience for teachers and students. The application covers the Arabic course and consists of multiple multimedia elements such as 3D objects, video, audio, and graphics to help students learn Arabic. As a result, the responses were very positive from both teachers and students where most users showed high interest and enjoyed their experiment in VR.

The focus in the initial stages of Arabic language education is to introduce and familiarise the students with the Arabic alphabet. Munsyi & Aljojo (2020) successfully developed an Arabic Alphabet application that consists of multiple multimedia elements for children 3 – 5 years. This supported the theory that multimedia platforms such as 3D objects, graphics, animation, and videos enhance their language skills. Additionally, Sweidan, S.Z. et al., (2018) explained that VR is a way to present a 3D image to the user to create an imaginary world to stimulate a real environment. However, the Arabic language is poorly represented in modern education technologies even though it is one of the most common languages in the world. Therefore, these issues must be addressed to support the modern education of the Arabic language involving the latest technologies (Al-Khattabi, 2017).

### 3.0 Problem Statements

Generally, learning the Arabic language as a foreign language still faces many problems, and it has existed for a long time, and under normal circumstances (Ritonga et al., 2021). According to Azman et al. (2010), the problems and difficulties in mastering the Arabic language for some students may come from the grammatical (Arabic grammar) aspect. One of the reasons for the phenomenon of weakness in Arabic grammar is the insistence of teachers and educational institutions on using traditional methods in T&L the Arabic language to non-native Arabic speakers, which causes a major obstacle to raising the level of T&L Arabic grammar in Malaysian schools specifically (Ibrahim, 2018).

Moreover, in recent times, many modern technologies have appeared that help teachers and students in the field of T&L in the Arabic language, but unfortunately, the use of modern technologies in the classroom is still limited, especially among Arabic language teachers (Nurkhamimi, 2014). This situation does not keep pace with the tendencies of today's students, because they are considered part of the digital generation. They live in the modern era in which information has exploded on websites, applications, phones, and computers (Akasyah, 2018).

Using the appropriate educational method will have an impact on solving the problem of learning the Arabic language (Daniel Hilmi et al., 2020). Based on that, the current researchers believe that the use of technology, i.e. VR technology is one of the modern educational methods that should be implemented and not to be ignored in the T&L process. From their belief, they are prompted to develop an application based on VR technology named Arabic-VR Application for learning Arabic grammar.

### 4.0 Needs Analysis

Developing a module or model (product) requires a needs analysis. It is a necessary phase to be conducted to gather data. The data then will be used to validate the development of such a module or model. Findings from the needs analysis will be evaluated and used for such purpose, hence fulfilling the objective of developing a module or model that is suitable with the target group. Needs analysis is a process that involves the collection of information or data related to the specific needs of target clients in industry or education (Fauzi, 2020). In the field of research, especially in the Design and Development (DDR) approach for example, this phase is a primary focus as it is in the initial phase of this approach. It is one of three significant phases of the DDR approach. The needs analysis phase is important in providing, identifying, and using research questions in the process of developing a module or model (Mohd Ridhuan et al., 2014). Therefore, this phase is carried out to explore the needs to develop an application named Arabic-VR Application using VR technology in learning Arabic grammar.

### 5.0 Research Objective

Based on the above-mentioned problem statements, this research intends to explore the need to use Virtual Reality (VR) technology in learning Arabic grammar. To gather data which will be used to develop an application named Arabic-VR Application that fulfills the student's needs, the objective of Phase 1 (Needs Analysis Phase) of this research is:

1. To explore the students' needs in designing and developing the Arabic-VR Application using Virtual Reality (VR) technology in learning Arabic grammar.

Based on the aforementioned objective, this study is conducted to gather answers to the following question:

1. What is the students' needs in designing and developing the Arabic-VR Application using Virtual Reality (VR)

technology in learning Arabic grammar?

## 6.0 Research Methodology

The details of the employed research methodology of this research are presented below:

### *Needs Analysis*

The needs analysis for this research was the first phase in the product development study based on the Design and Development (DDR) approach (Richey & Klein, 2007) before the administration of the second phase i.e. product design phase. This research used a questionnaire as the research instrument in the phase of needs analysis to explore the needs to develop the Arabic-VR Application based on VR technology by looking at the students' perspectives. This research focused on the Arabic Language subject (subject code: DTU2022), which is a compulsory subject for all students from various programs at KUIPs. This subject is offered in the first semester of the study plan provided by the Centre for Languages and General Studies.

### *Sampling Procedure*

This research focused on the Arabic Language subject (subject code: DTU2022), which is a compulsory subject for all students at KUIPs. This subject is offered in the first semester of the study plan provided by the Centre for Languages and General Studies. The sampling in this research was in the form of convenience sampling. This method was consistent with the research conducted based on readiness and accessibility in obtaining feedback from the participants. Respondents were made up of a total of 150 students who are taking this subject at the centre. The number represented all students from various programs where the data was collected to get their perspectives on the needs to develop this product or application.

The respondents involved in this analysis phase are as shown in Table 1 below:

**Table 1**  
Respondents for The Needs Analysis Phase

<b>Respondents</b>	<b>Frequency</b>
Foundation in Islamic Studies	5
Diploma in Arabic Language	1
Diploma in Islamic Studies	79
Diploma in Syariah	28
Diploma in Islamic Wealth Management	16
Diploma in Islamic Banking	20
Diploma in Al-Quran Wal-Qiraat	1
<b>Total</b>	<b>150 students</b>

### *Research Instrument*

The instrument used in the first phase (the needs analysis) of this research was a questionnaire. This questionnaire was adapted from the study by Amani (2019) and Abdul Rahman (2022). A pilot study was first conducted on 30 students to find the value of Cronbach's Alpha reliability score for the needs analysis questionnaire, and the score was (0.868), indicating a high level of data interpretation. This score is considered acceptable and high and can be adopted in this study because Pallant (2007) stated that Cronbach's alpha is acceptable in a study if the score exceeds (0.7). This Cronbach's alpha analysis showed that all 43 items of the questionnaire had good internal consistency.

Conversely, to measure the students' perspectives on the needs to develop the Arabic-VR application for the study of Arabic grammar, 5 levels of the Likert scale were employed by the researchers, namely: 5 (Strongly Agree), 4 (Agree), 3 (Not Sure), 2 (Disagree), and 1 (Strongly Disagree). Analytical findings on frequency distribution, percentage, mean, and standard deviation were obtained through descriptive statistical analysis in Statistical Package for Social Science (SPSS) software. The questionnaire used was structured and modified based on the needs analysis instrument. There were five areas of focus in the questionnaire, namely the demographic background of the respondents, motivation of learning the Arabic language, knowledge and needs of using the Arabic-VR Application in learning Arabic grammar, interface and features of Arabic-VR Application in learning Arabic grammar, and the level of acceptance of the idea of the development of the Arabic-VR Application using VR technology in learning Arabic grammar among KUIPs students.

### *Data Analysis and Interpretation*

Data analysis for the phase of needs analysis used Statistical Package for Social Science (SPSS) software. The analysis performed was descriptive in terms of frequency distribution, percentages, mean, and standard deviations. Descriptive analysis results were used to determine the level of needs for the Arabic-VR Application in learning Arabic grammar according to students' perspectives. The mean scores and standard deviations were analyzed to obtain the students' consent level. The mean interpretation scales were obtained from Rebecca Oxford, (1990) as shown in Table 2:

**Table 2**  
Mean Interpretation Value

	<b>Value</b>	<b>Interpretation</b>
<b>Mean score</b>	4.5 – 5.0	Very High
	3.5 – 4.5	High
	2.5 – 3.4	Average
	1.5 – 2.4	Low
	1.0 – 1.4	Very Low

Source: Rebecca Oxford (1990)

### **7.0 Research Results and Findings**

The findings of the study show that students have a high level of perspectives about their needs on developing the Arabic-VR Application using VR technology in learning Arabic grammar. As a result, they agreed that the Arabic-VR Application can attract their attention and interest in learning Arabic grammar.

The results of this study are presented below:

#### *The Motivation of Learning the Arabic Language*

The results are shown in Table 3 below:

**Table 3**  
The Motivation of Learning the Arabic Language

	<b>B: The Motivation of Learning the Arabic Language</b>	<b>Mean</b>	<b>SD</b>	<b>Interpretation</b>
B1	I want to get the best grades in university.	4.64	0.658	Very High
B2	I want to succeed in the exam.	4.75	0.530	Very High
B3	I learned Arabic because it is a compulsory subject at university.	3.77	0.963	High
B4	I want to get the best job in the future.	3.78	0.516	High
B4	I learn Arabic because I want to get to know Arab culture better.	3.97	0.857	High
B6	I learned Arabic because it is useful when reading the Quran.	4.65	0.555	Very High
B7	I learned Arabic because I felt embarrassed in front of my friends.	3.05	1.214	Average
B8	I learn Arabic because I want to understand the content of Arabic books.	4.23	0.797	High
B9	I learned Arabic because I want to talk to Arabs.	4.19	0.862	High
B10	I learned Arabic because my parents wanted me to learn it.	3.33	1.103	Average
B11	I learn Arabic because it is the language of the Quran.	4.63	0.608	Very High
B12	I learned Arabic because it is interesting.	4.21	0.766	High
B13	I am learning Arabic because I want to master many foreign languages.	4.00	0.890	High
	<b>Average</b>	<b>4.09</b>	<b>0.790</b>	<b>High</b>

Based on Table 3 above, the interpretation of the data showed that the motivation to learn the Arabic language among



the students was at a high level, with an overall mean value of 4.09 and a standard deviation of 0.790. This result showed that students are in high motivation to learn the Arabic language. 4 items were at very high value and the highest value was the item with “I want to succeed in the exam” with a value (M= 4.75, SD= 0.530), followed by the item with “I learned Arabic because it is useful when reading the Quran” with value (M= 4.65, SD= 0.555), the item with “I want to get the best grades in university” with value (M= 4.64, SD= 0.658), and lastly item with “I learn Arabic because it is the language of the Quran” with value (M= 4.63, SD= 0.608).

7 items were at a high value. The item with “I learn Arabic because I want to understand the content of Arabic books” with value (M= 4.23, SD= 0.796), the item with “I learned Arabic because it is interesting” with value (M= 4.21, SD= 0.756), the item with “I learned Arabic because I want to talk to Arabs” with value (M= 4.19, SD= 0.862), item with “I am learning Arabic because I want to master many foreign languages” with value (M= 4.00, SD= 0.890), item with “I learn Arabic because I want to get to know Arab culture better” with value (M= 3.97, SD= 0.847), item with “I want to get the best job in the future” with value (M= 3.78, SD= 0.516), and lastly item with “I learned Arabic because it is a compulsory subject at university” with value (M= 3.77, SD= 0.963).

There were 2 items at an average value. The item “I learned Arabic because my parents wanted me to learn it” with value (M= 3.33, SD= 1.103), and lastly item “I learned Arabic because I felt embarrassed in front of my friends” was the lowest with a value (M= 3.05, SD= 1.214).

***The Knowledge and Needs of Using the Arabic-VR Application in Learning Arabic Grammar***

The results are shown in Table 4 below:

**Table 4**

The Knowledge and Needs of Using the Arabic-VR Application in Learning Arabic Grammar

	<b>C: The Knowledge and Needs of Using the Arabic-VR Application in Learning Arabic Grammar</b>	<b>Percentage %</b>	
		<b>Yes</b>	<b>No</b>
C1	I know about Virtual Reality (VR) Application.	48.0	52.0
C2	I want to know more about Virtual Reality (VR) Application.	93.7	6.3
C3	I think it is necessary to develop a Virtual Reality (VR) Application for learning Arabic (grammar).	93.7	6.3
C4	I want to learn how to use a Virtual Reality (VR) Application in my learning process.	93.3	6.7
C5	I am ready to use the Virtual Reality (VR) Application if KUIPs implement it now.	89.7	10.3
C6	I want to produce a learning product based on a Virtual Reality (VR) Application.	90.0	10.0

Based on Table 4 above, more than half (52.0 %) of the respondents do not know about the Virtual Reality (VR) Application, while the other half (48.0 %) know about this application. Meanwhile, most of them (92.7 %) want to know more about Virtual Reality (VR) Application and only a few (7.3 %) do not want to know it. Furthermore, most of them (92.7 %) think it is necessary to develop a Virtual Reality (VR) Application for learning Arabic grammar and only a few (7.3 %) do not think it is necessary. Besides that, most of them (93.3 %) want to learn how to use a Virtual Reality (VR) Application in the learning process while only a few (6.7 %) do not want to learn how to use it. Then, most of them (88.7 %) are ready to use the Virtual Reality (VR) Application if KUIPs implements it now, while only a few (11.3 %) are not ready to use it. On top of that, most of them (90.0 %) want to produce a learning product based on a Virtual Reality (VR) Application and a few of them (10 %) do not want to produce it.

***The Interface and Features of Arabic-VR Application in Learning Arabic Grammar***

The results are shown in Table 5 below:

**Table 5**

The Interface and Features of Arabic-VR Application in Learning Arabic Grammar

	<b>D: The Interface and Features of Arabic-VR Application in Learning Arabic Grammar</b>	<b>Mean</b>	<b>SD</b>	<b>Interpretation</b>
D1	I would like the Arabic-VR Application to have an individual registration before starting the teaching and learning process.	3.89	0.909	High
D2	I would like the Arabic-VR Application to be in bilingual mode (Arabic-English).	4.03	1.058	High
D3	I would like the duration of learning Arabic (grammar) using the Arabic-VR Application to be more than 10 minutes for each learning session.	4.00	0.882	High
D4	I would like the Arabic-VR Application can be used without the need for an internet network connection.	4.11	0.963	High
D5	The content delivery method of watching visual videos in the Arabic-VR Application is suitable for me.	4.03	0.865	High
D6	The content delivery method of answering visual exercises in the Arabic-VR Application is suitable for me.	3.91	0.893	High
D7	I would like the Arabic-VR Application to be available for free.	4.39	0.802	High
D8	I would like the Arabic-VR Application to be in landscape / horizontal orientation.	4.03	0.888	High
D9	I would like the Arabic-VR Application to be in portrait / vertical orientation.	3.52	1.230	High
D10	I would like the Arabic-VR Application to be in a colorful form.	4.32	0.915	High
D11	I would like the Arabic-VR Application to have an option button for multimedia elements.	4.20	0.851	High
D12	I would like the pictures in the Arabic-VR Application to be in static mode.	3.85	1.079	High
D13	I would like the Arabic-VR Application to have a multimedia element (TEXT).	4.30	2.937	High
D14	I would like the Arabic-VR Application to have a multimedia element (IMAGE / PICTURE).	3.69	2.164	High
D15	I would like the Arabic-VR Application to have a multimedia element (AUDIO RECORDING).	4.40	1.865	High
D16	I would like the Arabic-VR Application to have a multimedia element (VISUAL / VIDEO RECORDING).	4.18	1.784	High
D17	I would like the Arabic-VR Application to have a multimedia element (ANIMATION).	4.27	1.956	High
D18	I would like the Arabic-VR Application to have a multimedia element (LANGUAGE GAMES).	4.30	1.889	High
D19	I would like the Arabic-VR Application to have a multimedia element (3D-DIMENSIONS).	4.91	2.375	Very High
D20	I would like the Arabic-VR Application to have a multimedia element (INTERACTIVE).	4.95	2.721	Very High
	<b>Average</b>	<b>4.16</b>	<b>1.450</b>	<b>High</b>

Based on Table 5 above, the data interpretation showed the students' desires for the interface and features of the Arabic-VR Application in learning Arabic grammar. Their desires were at a high level, with an overall mean value of 4.16 and a standard deviation of 1.450. This result showed that students have a desire for the development of Arabic-VR Application.

2 items were at a very high value and the highest value was the item with "I would like the Arabic-VR Application to have a multimedia element (INTERACTIVE)" with a value (M= 4.95, SD= 2.721), followed by the item with "I would like the Arabic-VR Application to have a multimedia element (3D-DIMENSIONS)" with value (M= 4.91, SD= 2.375).

18 items were at a high value. Item with “I would like the Arabic-VR Application to have a multimedia element (AUDIO RECORDING)” with value (M= 4.40, SD= 1.865), item with “I would like the Arabic-VR Application to be available for free.” with value (M= 4.39, SD= 0.802), item with “I would like the Arabic-VR Application to be in a colorful form” with value (M= 4.32, SD= 0.915), item with “I would like the Arabic-VR Application to have a multimedia element (TEXT)” with value (M= 4.30, SD= 2.937), item with “I would like the Arabic-VR Application to have a multimedia element (LANGUAGE GAMES)” with value (M= 4.30, SD= 1.889), item with “I would like the Arabic-VR Application to have a multimedia element (ANIMATION)” with value (M= 4.27, SD= 1.956), item with “I would like the Arabic-VR Application to have an option button for multimedia elements” with value (M= 4.20, SD= 0.851), item with “I would like the Arabic-VR Application to have a multimedia element (VISUAL / VIDEO RECORDING)” with value (M= 4.18, SD= 1.784), item with “I would like the Arabic-VR Application can be used without the need for an internet network connection” with value (M= 4.11, SD= 0.963), item with “I would like the Arabic-VR Application to be in bilingual mode (Arabic-English)” with value (M= 4.03, SD= 1.058), item with “The content delivery method of watching visual videos in the Arabic-VR Application is suitable for me” with value (M= 4.03, SD= 0.855), item with “I would like the Arabic-VR Application to be in landscape / horizontal orientation” with value (M= 4.03, SD= 0.878), item with “I would like the duration of learning Arabic grammar using the Arabic-VR Application to be more than 10 minutes for each learning session” with value (M= 4.00, SD= 0.882), item with “The content delivery method of answering visual exercises in the Arabic-VR Application is suitable for me” with value (M= 3.91, SD= 0.893), item with “I would like the Arabic-VR application to have an individual registration before starting the teaching and learning process” with value (M= 3.89, SD= 0.909), item with “I would like the pictures in the Arabic-VR Application to be in static mode” with value (M= 3.85, SD= 1.079), item with “I would like the Arabic-VR Application to have a multimedia element (IMAGE / PICTURE)” with value (M= 3.69, SD= 2.164), and lastly item with “I would like the Arabic-VR Application to be in portrait / vertical orientation” with value (M= 3.52, SD= 1.230) was the lowest value.

***The Level of Acceptance of the Idea of Development of the Arabic-VR Application Using VR Technology in Learning Arabic Grammar Among KUIPs Students***

The results are shown in Table 6 below:

**Table 6**

The Level of Acceptance of the Idea of Development of the Arabic-VR Application Using VR Technology in Learning Arabic Grammar Among KUIPs Students

	<b>E: The Level of Acceptance of the Idea of Development of the Arabic-VR Application Using VR Technology in Learning Arabic Grammar Among KUIPs Students</b>	<b>Mean</b>	<b>SD</b>	<b>Interpretation</b>
E1	Using the Arabic-VR application will make the teaching more interesting.	4.23	0.860	High
E2	Using the Arabic-VR application will increase my motivation to learn Arabic grammar.	4.13	0.841	High
E3	Teaching using the Arabic-VR application will be fun.	4.25	0.853	High
E4	Using the Arabic-VR application would be a very good idea in teaching.	4.23	0.860	High
E5	I have a positive attitude towards the use of Arabic-VR application in learning.	4.15	0.873	High
	<b>Average</b>	<b>4.20</b>	<b>0.867</b>	<b>High</b>

Based on Table 6 above, the interpretation of the data showed that the level of acceptance of the idea of the development of the Arabic-VR Application using VR technology in learning Arabic grammar among KUIPs students was at a high level, with an overall mean value of 4.20 and a standard deviation of 0.857. This result showed that students accepted the idea of the development of this application. All items were at a high value and the highest value was the item with “Teaching using the Arabic-VR Application will be fun” with value (M= 4.25, SD= 0.853), followed by item with “Using the Arabic-VR Application will make the teaching more interesting” and “Using the Arabic-VR Application would be a very good idea in teaching” with value (M= 4.23, SD= 0.860) for both items, item with “I have a positive attitude towards the use of Arabic-VR application in learning” with value (M= 4.15, SD= 0.873), and lastly item with “Using the Arabic-VR Application will increase my motivation to learn Arabic grammar” with value (M= 4.13, SD= 0.841).



***The Additional Suggestions for the Development of Arabic-VR Application in Learning Arabic Grammar among KUIPs Students***

The results are shown in Table 7 below:

**Table 7**

Additional Suggestions for the Development of Arabic-VR Application in Learning Arabic Grammar among KUIPs Students

No.	Additional Suggestions
1	Maybe you can combine the teaching with music and games so that the students will not get easily bored.
2	It is necessary to make more games in VR to attract students.
3	I suggest doing an Arabic language quiz in VR to evaluate and clarify students learning Arabic.
4	This VR needs to be used without the internet.
5	VR may be the best tool for learning Arabic so I agree that VR should be implemented.
6	More illustration or animation.
7	VR language games.
8	Simple design and interactive.
9	HD gameplay.
10	Make a colorful image.
11	Make it compact, comfortable, and weightless; the audio should be stereo (3D).
12	Make it realistic and in simulator mode.
13	Include challenges, quizzes, and games that assess grammar proficiency and provide instant feedback.

**8.0 Discussion**

The results and findings of this study indicate urgency for the development of Arabic-VR Application using VR technology to equip and attract students' interest in learning Arabic grammar. Research results and findings also showed that most students have a high level of perspectives regarding their motivation for learning the Arabic language, their knowledge and needs for using the Arabic-VR Application in learning Arabic grammar, their desire for the interface and features of Arabic-VR Application in Learning Arabic Grammar, and their level of acceptance of the idea of development of the Arabic-VR Application using VR Technology in learning Arabic grammar.

Based on the results of the motivation to learn the Arabic language among the students, the interpretation of the data showed that their motivation was at a high level, with an overall mean value of 4.09 and a standard deviation of 0.790. This result showed that students are in high motivation to learn the Arabic language.

Next, the results of their knowledge and needs for using the Arabic-VR Application in learning Arabic grammar. The data indicated that more than half (52.0%) of the respondents do not know about the Virtual Reality (VR) application, while the other half (48.0%) know about this application. The data also indicated that most students (92.7%) think it is necessary to develop a Virtual Reality (VR) application for learning Arabic grammar. Meanwhile, most of them (92.7%) want to know more about Virtual Reality (VR) application. Besides that, most of them (93.3%) want to learn how to use a Virtual Reality (VR) application in the learning process. Then, most of them (88.7 %) are ready to use the Virtual Reality (VR) application if KUIPs implement it now. On top of that, most of them (90.0 %) want to produce a learning product based on a Virtual Reality (VR) application.

Next, the analysis of their desire for the interface and features of the Arabic-VR Application in learning Arabic grammar showed that their desire for the interface and features of the Arabic-VR Application in learning Arabic grammar was at a high level, with an overall mean value of 4.16 and a standard deviation of 1.450. This result showed that students have a desire for the development of Arabic-VR Application. They agreed that the features included in the Arabic-VR Application assist their interest in certain information. The syllabus for the subject entitled Arabic Language (subject code: DTU 2022) uses books that need concise and recreated explanations that pay attention to important aspects. This is appropriate with the features of VR technology with the element of multiple multimedia that aims at simplifying complex information to appear more concise, easier to comprehend, focused, and appealing with numerous colourful graphics.

Finally, the data interpretation of students' level of acceptance of the idea of the development of the Arabic-VR Application using VR Technology in learning Arabic grammar was at a high level, with an overall mean value of 4.20 and a standard deviation of 0.857. This result showed that students accepted the idea of the development of this application.

## 9.0 Conclusion

In conclusion, incorporating VR technology into Arabic grammar learning is highly advantageous for students, in the context of 21st-century education. It should be embraced as a teaching and learning method in universities to enhance the effectiveness of classroom instruction and diversify learning approaches. This technology can change students' negative perspectives of Arabic grammar subjects, thereby increasing their interest and achievement in this subject. The presence of VR introduces new technology in university education and complements and enhances existing educational practices. This technology will be the most interesting and effective learning medium for Arabic grammar learning. The researchers hope that future studies will focus more on investigating the effectiveness of using VR technology for learning Arabic grammar by conducting experimental studies including pre-test, post-test, and t-test as well.

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