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Need Analysis of a Quranic Reflection Model Through Learning Arabic Vocabulary Specifically for Hearing Impairment Adults Using Augmented Reality Technology

Nabilah Fasihah Ahmad Yusoff[1], Ummu-Hani Abas* [2], Mohammad Najib Jaffar[3], Ahmad Asyraf Mat Ali[4], Mohammad Lukman Al-Hakim Md. Noor[5], Mohd Fadzil Abdul Hanid[6], Norakyairee Mohd Raus[7].

[1,2,3,4,7] Universiti Sains Islam Malaysia, Negeri Sembilan, Malaysia, [5] Universiti Islam Antarabangsa Malaysia, Selangor, Malaysia, [6] Universiti Teknologi Malaysia, Johor, Malaysia

Fy_bilah@raudah.usim.edu.my[1], ummuhani@usim.edu.my*[2], najib@usim.edu.my[3], asyrafali@usim.edu.my[4], lukmanhakim@iium.edu.my[5], mohdfadzilabdulhanid@utm.my[6], norakyairee@usim.edu.my[7].

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Abstract

This study aims to analyze the need for a new model design of Quranic reflection through learning Arabic vocabulary for adult learners with hearing impairments using innovative Augmented Reality Technology. Learning the Arabic vocabulary contained in the Al-Quran and understanding its meaning will facilitate the process of reading, understanding, memorizing, and practicing it. Nevertheless, Tadabbur Al-Quran through a vocabulary approach based on Augmented Reality Technology for deaf adult learners has still not been researched and developed. Therefore, a new model should be well-designed and appropriate to their needs and preferred learning styles. This study uses the needs analysis model of Hutchinson and Waters, 1987 which consists of Lacks, Needs, and Wants to collect data. The study findings show that most respondents do not know the Arabic vocabulary in Juzu'30 related to humans, animals, plants, and other natural creations and phenomena. In addition, the majority of them agreed to learn these Arabic vocabularies in Juzu'30 with the help of AR technology. This study will contribute to provide an effective learning experience for adult learners with hearing impairments using Augmented Reality Technology.

Keywords: Al-Quran Reflection; Arabic Vocabulary; Adult; Hearing-impaired; Augmented Reality.

INTRODUCTION

Quranic education indeed greatly benefits from the practice of reflection which is known as Tadabbur. Tadabbur al-Quran means the contemplation or deep understanding of the Quran. Tadabbur al-Quran also means a comprehensive reflection process while reading and listening to the Qur'an, including pronunciation of letters, words, and recitation of the Qur'an as well as understanding the meaning and practical appreciation of al-Quran verses (Mohd Faizulamri et al. 2020). According to Al-Qaradawi (1999), a Muslim should start by taking care of, reading, listening, meditating, practicing, appreciating, and hoping for the education of the Qur'an. According to al-Khalidi (1995), there are three main ways to interact with the Quran, the first is to read the Qur'an with proper manners while the second requires memorizing and repeating memorization. Lastly, meditate and reflect on the contents of the Qur'an. Therefore, The Quran emphasizes the importance of reflection,

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inviting believers to ponder upon its verses and increase in wisdom. It is asked in Surah Al-Mu'minun:

﴿أَفَلَمْ يَدَّبَّرُواْ ٱلْقَوْلَ أَمْ جَآءَهُم مَّا لَمْ يَأْتِ ءَابَآءَهُمُ ٱلْأَوَّلِينَ﴾ (23:68)

Means: Then have they not reflected over the Qur'an, or has there come to them that which had not come to their forefathers?

Nowadays, the challenges faced in Quranic education for individuals with hearing impairments are quite significant. The need for more inclusive and accessible educational resources becomes imperative. The current approach to Quranic education for deaf adults lacks structure and systematic methodology, hindering their effective understanding and access to the Quranic teachings. Most deaf students are also not given enough exposure to learning the Quran compared to hearing students. (Ab Aziz Mohd Zin et al., 2009). According to Muhammad Sayuti Sabdan et al. (2017), the implementation of al-Quran education for the group of people with disabilities especially adult deafness is still at a low level and not systematic. The deaf community expresses a desire for Quranic education that meets their specific needs, akin to what is available for typical learners. The lack of tailored syllabi for deaf students in Quranic education poses significant challenges because it is not designed for deaf students and does not have any difference compared to the syllabus for normal students. (Nik Hassan Seman et al., 2019). In addition, he said that feeling small and weak in the face of obstacles among deaf students will make them admit defeat too soon. Therefore, instilling a sense of perseverance and resilience in them is crucial. Acknowledging the challenges while fostering a positive mindset can empower them to find creative solutions and strategies to overcome these difficulties.

In parallel with the advancement of technology, the use of Augmented Reality is seen as a Teaching Aid that is very systematic and attracts the interest of adult hearing-impaired students to understand and study the Quran. From the previous studies, the use of Augmented Reality technology in learning Al-Quran has expanded in learning Al-Quran memorization, tajwid law, and prayer application.

There is a study written by Hayatunnufus Ahmad et al., (2019) entitled "Augmented Reality Model to Aid Al-Quran Memorization for Hearing Impaired Students" which endeavors to create an inclusive software model designed to aid hearing-impaired students in memorizing the Quran named mAR-Quran. This proposed prototype utilizes Augmented Reality Based Content (ARBC) to meet the developmental needs of an augmented reality environment. Through this model, students can organize the sequence of verses within surahs accurately, facilitating an improved and more accessible Quranic memorization process.

Besides, a study conducted by Nurtihah Mohamed Noor et al., (2019) entitled "Measuring Tajweed Augmented Reality-Based Gamification Learning Model (TARGaLM) Implementation for Children in Tajweed Learning" showed that this model demonstrated significant success in fostering autonomy, challenge, point accumulation, badge acquisition, leaderboard standings, progression, immersion, and feedback—all pivotal elements contributing to a more enjoyable experience. Post-activity interviews with students highlighted their appreciation for the engaging nature of the proposed approach.

There is another research work written by Nurul Fatin Athirah Ismail et al., (2022) named "e-Bimbing Solat: The Development of Augmented Reality Digital Content to

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Enhance Learning Experience for Patients to Perform Prayers". This research aimed to explore innovative, more efficient approaches to delivering knowledge. This study showed that leveraging mobile devices integrated with Augmented Reality (AR) technology can significantly improve patients' comprehension of learning and practicing prayers. AR also enables users to visualize 2D or 3D virtual objects overlaid onto the real world, amplifying understanding and engagement.

Thera is also a study conducted by Roslinda Ramli et al., (2020) in developing a groundbreaking model called TARLM (Tadabbur Augmented Reality Learning Model). TARLM illustrates our understanding of how the features of a Tadabbur AR Book interact with various elements to create a rich learning setting. This model stems from the tadabbur learning process through reading, hearing, understanding, feeling, receiving truth, and responding combined with AR technology, integrating four phases of Kolb's experiential learning model: concrete experience, reflective observation, abstract conceptualization, and active experimentation.

A recent study by Yusof, Mohd. et al., (2023) explored the integration of Augmented Reality (AR) for teaching Arabic vocabulary to primary school students enrolled in KAFA. The research aimed to assess the usability of 'Arabic KAFA, a mobile educational application tailored for KAFA students. Ten experts utilized the FDM (Formal Design Method) to evaluate this application's usability, concluding that its incorporation of augmented reality technology holds promising potential for enhancing the learning of Arabic vocabulary among primary school students. The study suggests that the integration of AR in this educational mobile application could positively impact teaching Arabic vocabulary, potentially benefiting students' achievement and motivation.

However, there is a noticeable absence of research and development concerning the application of AR technology specifically for hearing-impaired learners in understanding the Quran through a vocabulary-based approach. There are no teaching aids in sign language and deaf-friendly materials that would help them and the absence of these aids and materials makes it harder for teachers to teach deaf students (Nik Hassan Seman et al., 2019). AR book enhanced with AR technology is seen as promising tool that could give motivation in learning. Passing and Eden (2000) mentioned that this application develops inference skills, perception skills, imagination, and 3D thinking skills among hearing-impaired students.

In this regard, learning materials specifically designed for deaf students should be developed including Quranic words in texts presented in sign language, visual aids, interactive digital resources, and other materials accessible and comprehensible for the deaf. It will offer a multisensory experience that goes beyond traditional text-based learning. Therefore, this study aims to analyze the need for a new model design of Quranic reflection through learning Arabic vocabulary for hearing-impaired adult learners with the help of Technology Augmented Reality (AR) before constructing this model.

METHOD

This study uses a quantitative method. The Data Collection process is carried out using several methods as follows;

First: Documents Analysis

Data was obtained from books, theses, journal articles, and seminar papers based on the objectives of the study. Only documents related to this model were selected and analyzed

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to know the aspects of the construction requirements of this model design and prepare for the questionnaire.

Second: Construction of Questionnaire

The questionnaire was constructed based on document analysis and the objective of this study by using a five-scale Likert (Strongly Disagree- Do Not Agree- Not Sure- Agree- Totally Agree) to discover the needs of this model.

Third: Pilot Study

Before the questionnaire was used, a pilot study was conducted to get the reliability index of each construct or item in the questionnaire. For Sekaran (1992) a Cronbach Alpha value of less than 0.60 is not acceptable, a value between 0.60 to 0.80 is acceptable and a value above 0.80 is considered good and can be used. The result of this study shows that Cronbach's Alpha value score reached 0.9 and above for each item.

Fourth: Data Collection

In obtaining the data for the research, the researchers used a questionnaire as the instrument to discover the needs of this model by using Hutchinson and Waters's approach (1987) to identify Necessities, Lacks, and Wants. The questionnaire was distributed to 45 respondents among Muslim adults with hearing impairment after obtaining approval to collaborate with the Malaysian Deaf Muslim Association. (PRISMA) and after getting approval from Universiti Sains Islam Malaysia (USIM) to conduct a field study.

Fifth: Data Analysis

The results of the questionnaire were processed using SPSS software to leverage statistical analysis in identifying specific needs or patterns within the data that will inform the design of this model.

RESULTS AND DISCUSSION

The results of the analysis are described in frequency scores and percentages.

Respondent Demographics

The results of the demographic analysis of the respondents are as in Table 1;

Table 1. Respondent Demographics

No.	Item	Frequency	Percentage
Gender			
1.	Male	15	33.3
2.	Female	30	66.7
Age			
1.	31-40 years	9	20.0
2.	41-50 years	19	42.2

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3.	51-60 years	14	31.1
4.	61-70 years	3	6.7
Highest academic qualification			
1.	PMR/SRP	23	51.1
2.	SPM	5	11.1
3.	MASTER	1	2.2
4.	Others	16	35.6
Experience in learning Al-Quran			
1.	Less than a year	23	51.1
2.	1-3 years	15	33.3
3.	4-6 years	3	6.7
4.	More than 10 years	4	8.9
Experience in learning Arabic Language			
1.	Never	10	22.2
2.	Less than a year	28	62.2
3.	1-3 years	3	6.7
4.	4-6 years	4	8.9
The use of smartphones/ tablets			
1.	Never used	26	57.8
2.	Have used	19	42.2

The demographic results of the respondents show that the gender of the respondents consists of 30 deaf adult females and 15 adult deaf males. The age of the respondents consists of 4 age groups, namely between 31-40 years for a total of 9 people (20%), between 41-50 years for a total of 19 people (42.2%), 51-60 years for a total of 14 people (31.1%) and 61-70 year totaling 3 people (6.7%). As for their highest academic qualifications, a total of 23 people has PMR/SRP qualifications, 5 people have SPM qualifications, 1 person has Masters qualifications and 16 people have qualifications other than those mentioned above.

From the point of view of their experience in learning the Quran, a total of 23 people (51.1%) has studied it for less than a year, 15 people (33.3%) have studied it between 1-3 years, 3 people (6.7%) have studied it between 4-6 years and 4 people (8.9%) have been studying the Quran for more than 10 years. While from the point of view of their experience learning Arabic, it shows that a total of 10 people (22.2%) has not yet learned it, 28 people (62.2%) have just learned it in less than a year, 3 people (6.7%) have learned it between 1-3 years and 4 people (8.9%) have studied it between 4-6 years. In addition, in terms of the use of smartphones or tablets while studying, 26 people (57.8%) have never used them for learning purposes, while 19 people (42.2%) have used them and usually use them while studying.

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Need Analysis

The results of the need analysis are described in the frequency and percentage scores from the three aspects of Necessities, Lacks, and Wants as follows:

Necessities:

Necessity, in the context of education, refers to the essential requirements or conditions that are crucial for students to successfully achieve their educational goals. These necessities often vary based on the demands of the situation, the specific goals of the students, and the learning environment. Table 2 below shows the need for content and learning methods for hearing-impaired Muslim adults. Blackened numbers indicate those needs.

Table 2. Needs of Content and Learning Method

No.	Item	Frequency & Percentage					Mean
		Strongly Disagree	Do Not Agree	Not Sure	Agree	Totally Agree	
1.	I need to learn the Arabic vocabulary in Juzu' 30 related to humans.	1 2.2%	12 4.4%	0 0%	**13** **28.9%**	**29** **64.4%**	4.53
2.	I need to learn the Arabic vocabulary in Juzu' 30 related to animals.	0 0%	0 0%	2 4.4%	**18** **40.0%**	**25** **55.6%**	4.51
3.	I need to learn the Arabic vocabulary in Juzu' 30 related to plants.	2 4.4%	0 0%	1 2.2%	**17** **37.8%**	**25** **55.6%**	4.40
4.	I need to learn the Arabic vocabulary in Juzu' 30 related to natural events and phenomena.	0 0%	1 2.2%	2 4.4%	**20** **44.4%**	**22** **48.9%**	4.40
5.	I need to learn by using Augmented Reality (AR) Technology in accordance with technological advancement.	2 4.4%	0 0%	3 6.7%	**19** **42.2%**	**21** **46.7%**	4.27
6.	I need the help of AR Technology in a 3D visual way to interest me in learning vocabulary.	1 2.2%	0 0%	2 4.4%	**18** **40.0%**	**24** **53.3%**	4.42
7.	I need the help of AR Technology to see animated pictures of each vocabulary learned like reality.	0 0%	0 0%	4 8.9%	**14** **31.1%**	**27** **60.0%**	4.51

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8.	I need the help of AR Technology to see the fingerspelling of each letter from the learned vocabulary.	0 0%	0 0%	1 2.2%	**10** **22.2%**	**34** **75.6%**	4.73
9.	I need the help of AR Technology to understand the meaning of vocabulary more clearly using sign language videos.	0 0%	0 0%	1 2.2%	**10** **22.2%**	**34** **75.6%**	4.73

In items 1, 2, 3, and 4, 93.3% or 42 people state that they need to learn the Arabic vocabulary in Juzu' 30 related to humans, 95.6% or 43 people need to learn the Arabic vocabulary related to animals, 93.3% or 42 people need to learn the Arabic vocabulary related to plants and 93.3% or 42 people need to learn Arabic vocabulary related to natural events and phenomena. Besides, in terms of Augmented Reality (AR) Technology, 40 of them show their need for learning using AR in accordance with the technological advancement with a percentage score of 88.9% in item 5, and the help of AR Technology in a 3D visual way to interest them in learning vocabulary in item 6 with the score 93.3% or 42 people. Besides, 91.1% or 41 people state their need for the help of AR Technology to see animated pictures of each vocabulary learned like reality. Meanwhile, each expressed their agreement to the need for the help of AR Technology to see the fingerspelling of each letter from the learned vocabulary and to use sign language videos in order to understand the meaning of vocabulary more clearly with a score of 97.8% or 44 people on item 8 and 9.

From these results, it shows that they really need the development of this model in the aspect of knowledge of specific contents such as Arabic vocabulary in Juzu' 30 which relates to humans, animals, plants, and natural events and phenomena with the help of AR technology. They also really need to use the AR Book or Mobile AR visually in 3D to interest them in learning and see animated pictures of each vocabulary like reality. For instance, when a student points a device at a word, they can see a 3D representation or an animation illustrating the meaning of the word. In addition, AR could provide a visual aid by overlaying finger spelling motions or on top of printed or digital text when a student points a device at the word. This interactive feature allows learners to see the finger spelling and understand the meaning of the word. Hence, enhancing the educational setting using AR technology doesn't just boost the eagerness for both learning and teaching, it also adds greater significance. It empowers students to grasp concepts more swiftly and with increased depth (Zainuddin, 2010).

Lacks:

Identifying areas of lack or weaknesses in students is crucial for providing targeted support and facilitating their overall growth. Recognizing and addressing these gaps can significantly contribute to their academic improvement and personal development. Table 3 below shows the lack of knowledge in Arabic vocabulary, specifically in the Juzu' 30, and AR technology for hearing-impaired Muslim adults. Blackened numbers indicate those deficiencies.

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Table 3. Lacks knowledge of specific Arabic vocabulary in Juzu' 30 and AR technology

No.	Item	Frequency & Percentage					Mean
		Strongly Disagree	**Do Not Agree**	**Not Sure**	**Agree**	**Totally Agree**	
1.	I know the Arabic vocabulary in Juzu' 30 related to humans.	**14 31.1%**	**2 4.4%**	7 15.6%	13 28.9 %	9 20.0%	3.02
2.	I know the Arabic vocabulary in Juzu' 30 related to animals.	**26 57.8%**	**6 13.3 %**	9 20.0%	1 2.2%	3 6.7%	1.87
3.	I know the Arabic vocabulary in Juzu' 30 related to plants.	**27 60.0%**	**6 13.3 %**	7 15.6%	3 6.7%	2 4.4%	1.82
4.	I know the Arabic vocabulary in Juzu' 30 related to natural events and phenomena.	**33 73.3%**	**3 6.7%**	7 15.6%	0 0%	2 4.4%	1.56
5.	I have heard about Augmented Reality (AR) Technology	**35 77.8%**	**5 11.1 %**	2 4.4%	1 2.2%	2 4.4%	1.44
6.	I have learned using Augmented Reality (AR) Technology	**37 82.2%**	**4 8.9%**	0 0%	3 6.7%	1 2.2%	1.44

In items 1, 2, 3, and 4, 35.5% or 16 people stated that they did not know Arabic vocabulary in the Juzu' 30 related to humans, 71.1% or 32 people did not know the Arabic vocabulary related to animals, 73.3% or 33 people less know Arabic vocabulary related to plants, and 80.0% or 36 people do not know Arabic vocabulary related to natural events and phenomena. In addition, in terms of Augmented Reality (AR) Technology, 40 of them indicated that they had never heard about Augmented Reality (AR) Technology with a score percentage of 88.9% in item 5, and they had never used Augmented Reality (AR) Technology in learning with a score of 91.1%, or 41 people in item 6.

From these findings, it shows that they do not know Arabic vocabulary in Juzu' 30 which is related to humans, animals, plants, and natural events and phenomena. They also never heard about Augmented Reality (AR) Technology and never learned to use Augmented Reality (AR) Technology before.

Wants:

Understanding what students want to learn involves recognizing their personal interests, passions, and aspirations regarding their educational journey. This goes beyond the necessities dictated by the curriculum or academic requirements. In finding out the

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'wants' some questions were given to the respondents based on their desires. Table 4 below shows the desire to learn certain Arabic vocabulary in Juzuk 30 with the help of Augmented Reality technology for hearing-impaired Muslim adults.

Table 4. Desires to learn Arabic vocabulary in Juzu' 30 with the help of AR technology

No.	Item	Frequency & Percentage					Mean
		Strongly Disagree	Do Not Agree	Not Sure	Agree	Totally Agree	
1.	I want to learn the Arabic vocabulary in Juzu' 30 related to humans.	0 0%	0 0%	1 2.2%	**15** **33.3%**	**29** **64.4%**	4.62
2.	I want to learn the Arabic vocabulary in Juzu' 30 related to animals.	0 0%	1 2.2%	2 4.4%	**15** **33.3%**	**27** **60.0%**	4.51
3.	I want to learn the Arabic vocabulary in Juzu' 30 related to plants.	0 0%	1 2.2%	0 0%	**20** **44.4%**	**24** **53.3%**	4.49
4.	I want to learn the Arabic vocabulary in Juzu' 30 related to natural events and phenomena.	0 0%	1 2.2%	0 0%	**19** **42.2%**	**25** **55.6%**	4.51
5.	I want to learn by using Augmented Reality (AR) Technology in accordance with technological advancement.	0%	2 4.4%	1 2.2%	**18** **40.0%**	**24** **53.3%**	4.42
6.	want to use the AR Book visually in 3D to interest me in learning vocabulary.	0 0%	0 0%	0 0%	**17** **37.8%**	**28** **62.2%**	4.62
7.	I want to use Mobile AR visually in 3D to interest me in learning vocabulary.	0 0%	0 0%	0 0%	**17** **37.8%**	**28** **62.2%**	4.62
8.	I want the help of AR Technology to see animated pictures of each vocabulary learned like reality.	0 0%	0 0%	0 0%	**18** **40.0%**	**27** **60.0%**	4.60
9.	I want the help of AR Technology to see the fingerspelling of each letter from the learned vocabulary.	0 0%	0 0%	1 2.2%	**10** **22.2%**	**34** **75.6%**	4.73
10.	I want the help of AR Technology to understand the meaning of vocabulary more clearly using sign language videos.	0 0%	0 0%	0 0%	**9** **20.0%**	**36** **80.0%**	4.80

In items 1, 2, 3, and 4, 97.7 or 44 people said they want to learn Arabic vocabulary in Juzu' 30 related to humans; 93.3% or 42 people want to learn Arabic vocabulary in

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Juzu' 30 related to animals; 97.7% or 44 people want to learn Arabic vocabulary related to plants; and 97.8% or 44 people want to learn Arabic vocabulary related to natural events and phenomena. In addition, in terms of Augmented Reality (AR) Technology, 42 of them showed their desire to learn to use AR in accordance with technological progress with a score percentage of 93.3% in item 5, and the help of Augmented Reality (AR) Technology books visually in 3D to attract their interest in learning vocabulary in item 6 with a score of 100%, or 45 people. Meanwhile, each of them expressed their desire to use mobile augmented reality technology visually in 3D to attract their interest in learning vocabulary and the help of augmented reality (AR) technology to see animated pictures of each vocabulary learned like reality with scores of 100% or 45 people on items 7 and 8. While 97.8%, or 44 people, want the help of augmented reality (AR) technology to see the fingerspelling of each letter from the vocabulary learned in item 9. However, in item 10, 100%, or 45 people, want the help of augmented reality (AR) technology to understand the meaning of vocabulary more clearly using sign language videos. Therefore, by integrating these desires into the educational process, this model can foster a more engaging and meaningful learning experience for them. According to past studies, multimedia features in augmented reality technology in language learning can help students master vocabulary in teaching and learning activities (Punar et al., 2022).

From Overall findings, descriptive statistics as mentioned in Table 4 below show the need for content and learning methods for hearing-impaired Muslim adults is high with a mean score of 4.5012 and a standard deviation of 0.53425, and the lack of knowledge in certain Arabic Vocabulary in Juzu' 30 and AR technology reached a mean score 1.8481 and a standard deviation 0.98718 while desires of learning certain Arabic vocabulary in Juzu' 30 with the help AR technology reached a mean score 4.5933 and a standard deviation 0.45597.

Table 5. Overall Mean Value and Standard Deviation of Needs, Lacks, and Wants

The mean score for variables	N	Mean	Std. Deviation
Needs	45	4.5012	0.53425
Lacks	45	1.8481	0.98718
Wants	45	4.5933	0.45597

CONCLUSION

There is a clear lack of research and development focused on utilizing AR technology specifically hearing-impaired adults for comprehending the Quran via a vocabulary-centered method. Hearing-impaired students' learning styles are more focused on visual forms by leveraging the advantage of technological facilities to produce quality teaching aids. For this reason, this study attempts to discover the need for a new model construction of Arabic vocabulary learning based on al-Quran reflection specifically for hearing-impaired adults with the help of Augmented Reality Technology. Most of them express

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an interest in acquiring Arabic vocabulary from Juzu' 30, which encompasses topics related to humans, animals, plants, and natural occurrences, using the assistance of AR technology. The success of this model could pave the way for further innovations in educational approaches for hearing-impaired individuals and offer them a more engaging, accessible, and culturally enriched learning environment.

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