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RESEARCH ARTICLE

ENHANCING ARABIC VOCABULARY MASTERY THROUGH AUGMENTED REALITY: A STUDY ON AR-MUFRADAT APPLICATION FOR PRIMARY SCHOOL STUDENTS

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Abstract

The advancement of modern technology has greatly influenced national development, with technologies like Augmented Reality (AR) increasingly integrated into education in Malaysia and Indonesia. Despite this, no study has yet explored the specific need for AR technology in teaching Arabic vocabulary from the KSSR syllabus in primary schools. Currently, students rely on traditional teaching methods, which limit their learning experience. This study investigates the need for AR-Mufradat development among Year 5 students at Sri Al-Amin Bangi Primary School. A quantitative approach was used, involving 30 students as respondents, and data was collected through a survey. The findings, analyzed using SPSS version 26, reveal a high demand for AR-Mufradat among these students. This study aims to guide future research, suggesting that AR technology could enhance the teaching and learning of Arabic, allowing students to master the language more effectively.

Introduction:-

It cannot be denied that the failure to remember the meaning of words can hinder students' vocabulary mastery. This issue becomes more challenging when teachers are forced to repeatedly teach words that have already been covered in class. Repeating old vocabulary leads to wasted time that could otherwise be used to introduce new vocabulary. In this context, students are often considered to have short-term memory. This memory capacity is quite limited at any one time, as short-term memory can only process around 7 ± 2 items. Naturally, this is not in line with the amount of vocabulary that students are expected to learn in class (Che Radiah &Norhayuza, 2011). Due to students having short-term memory, vocabulary teaching should be approached by incorporating visual elements, especially when teaching primary school students using Augmented Reality (AR) technology. Through these visual elements, students can more easily remember each word taught for a longer period (Garzon, 2021).

One of the valuable psychological findings related to memory issues is the process of remembering visual images (Che Radiah &Norhayuza, 2011). This finding was supported by a study conducted by Paivio (1971), which

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explained that information is stored in two ways: verbally (linguistically) or non-verbally (through images). In that study, Paivio found that non-verbal information, such as visual images, is easier to remember than verbal information. This correlates with the capabilities of AR technology, which combines virtual objects and the real world interactively in 2D and 3D real-time environments (Farhana & Fariza, 2017). Using AR, students can maintain a strong memory of a topic taught (Serin, 2017). Therefore, the use of visual and audio stimuli can help students better understand their lessons.

Learning Arabic in Malaysia is not considered as easy compared to Arabic-speaking countries where it is the native language. The limited opportunities to speak Arabic stem from the surrounding community not using the language in daily life. Arabic vocabulary mastery becomes more challenging when it is only learned in school. In contrast, many Malaysians are able to speak English fluently and confidently. This is because they are taught and encouraged to communicate in English from a young age. Thus, there is a significant gap between learning Arabic and English in Malaysia. For this reason, students must give more attention to learning Arabic so that it is on par with English education in Malaysia.

As technology evolves, modern technology is becoming increasingly sophisticated over time. The use of technology such as Augmented Reality (AR) has already been widely implemented in Malaysia and Indonesia. Previous studies have shown the use of AR as a tool for teaching English vocabulary in primary schools. In these studies, researchers focused specifically on enhancing vocabulary acquisition for primary school students. One study introduced the Quiver app as a learning tool to improve vocabulary mastery among students. Additionally, other studies have demonstrated the application of AR technology in enhancing reading skills for preschool children learning English. The findings from both studies showed an increase in student performance in the tests conducted (Fitria Rahmawati, 2021; Sharmili et al., 2021). Based on these studies, it is evident that English language learning is introduced from a young age, making it easier for students to learn.

However, four studies have also been conducted on Arabic language learning using AR technology. These studies aimed to identify the challenges faced by educators. In line with this, they also introduced new applications to support Arabic language development in primary schools. As expected, research on Arabic language learning is relatively new. Although findings indicate that many students respond positively to learning Arabic, improvements are still needed, such as creating more interactive animations and adding visual elements accompanied by audio of Arabic vocabulary (Ady Fauzan et al., 2020; Nurhazarifah et al., 2017; Mohd Kamarul et al., 2019; Mohd Akashah et al., 2022). Therefore, Arabic language learning has not gained widespread attention from society as it is still new, particularly at the primary school level.

In addition, previous researchers have also conducted studies on other languages such as Malay, Mandarin, Tamil, and German using AR technology. These studies focused on reading and basic counting skills in foreign languages. In these studies, the researchers emphasized knowledge related to recognizing characters and basic skills such as pronunciation and number spelling (Norabeerah et al., 2012; Robby et al., 2020; Ganesh Mukayah&Rosseni Din, 2021; Juan Christian et al., 2021; Intan Umaira et al., 2022; Nor Najwa Arifah & Fariza Khalid, 2019). In this context, researchers have conducted more studies on foreign languages than on Arabic. Since foreign languages are often used as learning materials, it is not surprising that students are more inclined to study other languages. Their neglect of Arabic learning indirectly affects their vocabulary acquisition, understanding of word meanings, correct pronunciation, proper word choice, and accurate word formation (Che Radiah &Norhayuza, 2011). These issues arise when students fail to remember new words, which can become a burden in mastering Arabic vocabulary. Therefore, educators should provide broader exposure to short-term vocabulary retention strategies.

Reflections from past studies show that many researchers have conducted general studies on vocabulary acquisition. They focused on how AR technology functions for students without examining the broader relationship between the technology and the learning process. What has been highlighted in previous studies reflects their concern for a more effective teaching and learning process. If the vocabulary learned by students is not retained, researchers will continue to investigate the use of AR technology, especially in Arabic language learning.

However, the need for AR-based technology development focusing on Arabic vocabulary from the KSSR syllabus has yet to be explored at the primary school level. In this context, researchers must pay more serious attention, as students are less exposed to AR technology. To this day, students are still confined to the traditional "chalk and talk" method, which only provides limited information (Ismail, 2012). With AR-based vocabulary learning, students are

more likely to grasp the learning content more easily (Yusof et al., 2019). Additionally, students can create visual maps according to their creativity and imagination. The inclusion of images in the learning process enables them to be more attentive and appreciative of every word displayed. Therefore, this study will be conducted on primary school students, focusing on learning Arabic vocabulary from the KSSR syllabus using AR technology.

Research Objectives:-

To identify the need analysis for the development of AR-Mufradat among Year 5 students at SekolahRendah Sri Al-Amin Bangi.

Augmented Reality Technologies in Language Education

Several previous studies have demonstrated that researchers have applied Augmented Reality (AR) technology in the education system. Firstly, a study aimed at identifying the level of awareness and perception of Malay language teachers towards the use of AR technology in education was conducted by Norabeerah et al. (2012). The study employed an interview protocol method with 44 Malay language teachers enrolled in a Teacher Training Diploma Course at a Teacher Education Institute (IPG). The findings of the study showed that teachers greatly benefited from the use of AR technology. Most of them responded positively to the application, stating that it facilitated teaching and also stimulated students' interest. The presence of this technology indirectly increased students' focus on the topics being taught in class. Consequently, the study raised teachers' awareness of the importance of continually applying AR technology in the teaching and learning process (PdP).

Additionally, a previous study highlighted research on the application of AR technology to increase students' interest in learning Mandarin at SMP IT Albana Natar, South Lampung (Robby et al., 2020). The researchers developed an AR application that could project Mandarin characters onto paper. Students were required to scan the objects provided on the paper, allowing the application to display character shapes from their smartphones. The findings showed that the AR application significantly increased students' attraction to the subject and made it easier for them to recognize Mandarin characters. Thus, AR technology helped improve students' comprehension and expand their Mandarin vocabulary.

Furthermore, another study was conducted on the use of Augmented Reality (AR) as a learning medium for Javanese script among children (Setia Wardani, 2015). The study arose from the observation that many children were uninterested in memorizing Javanese script and quickly became bored with the subject. This issue prompted the researcher to develop an AR application to help children recognize the shapes of Javanese script. The researcher employed the Microsoft Solution Framework (MSF), a system approach that brings real-world objects to life. The trial of the Ha script demonstrated smooth functionality, with the Ha script emerging on the computer after scanning the object. The findings indicated that AR technology could display Javanese script as simple three-dimensional objects, making the subject more engaging for children. Thus, virtual learning, especially through modern technology such as AR, simplifies the learning process.

Moreover, Fitria Rahmawati (2021) conducted a study on the use of Augmented Reality (AR) as a learning medium for English vocabulary among elementary school students. The researcher introduced the Quiver application as a learning tool to improve English vocabulary among students at SD Muhammadiyah Karangwaru. The application was created through printed, colored images. Statistical analysis showed a high pre-test vocabulary score (mean=87.00, SD=11.64, SE=1.97), and the post-test results recorded a significant improvement (mean=91.71, SD=10.77, SE=1.82). The Quiver application encouraged and guided students in learning English, enhancing their skills and ability to speak the language more fluently.

Augmented Reality Technology in Islamic Education

A previous study also explored the use of AR in teaching Sirah (the biography of the Prophet) in national primary schools in Betong, Sarawak (Amirah Syafiqah& Khadijah Abdul Razak, 2022). A total of 29 Year 2 students formed the control group, while 30 students participated in the treatment group, using AR interventions. The researchers found that many students were not interested in learning Sirah because they did not see it as an important subject like core subjects. However, after introducing AR-based learning methods, the post-test mean score for the treatment group was 79.07, compared to 46.34 for the control group, who followed traditional teaching methods. This showed a marked improvement in the students' achievement in learning Sirah. The use of AR also significantly enhanced students' ability to recall and understand the biography of Prophet Muhammad (PBUH), demonstrating that AR could enhance memory retention of prophetic events.

Augmented Reality Technology in Learning Tamil and Mandarin

Another study conducted by Ganesh Mukayah&Rosseni Din (2021) investigated the use of AR to teach Tamil reading skills to Year 4 students. The researchers developed an interactive e-module combining Tamil language AR (AuRa-BT) with the ROAR application. ROAR enables users to explore text or image details simply by scanning them. This application was deemed suitable for students, as it integrates text, graphics, video, and real-time interaction. The steps implemented by the researchers included:

1. Students accessed a free Wordpress website to obtain interactive Tamil word content.
2. Students examined pictures and words in the module.
3. Students scanned the images in the module using a smartphone to learn the pronunciation of the words.
4. The app provided audio and video through the ROAR app, teaching students how to pronounce the syllables.
5. After learning the word pronunciations, students were evaluated through the Quiz Whizzer game.

The study showed significant improvements in students' performance after the introduction of AuRa-BT, with 24 students (80%) achieving excellent results and 6 students (20%) showing good progress. AR technology greatly helped students master reading skills in the Tamil language. The researchers also noted that combining the application with 3D video, background music, 2D images, and engaging audio enhanced students' comprehension of Tamil words. Therefore, incorporating AuRa-BT among students is highly recommended to improve reading skills in Tamil.

In addition, another study by Sharmili Nair Vargavan& Faridah Yunus (2021) examined the use of AR in improving English word-reading skills among preschool children. The researchers found that most preschoolers were unable to recognize, pronounce, or read English words despite being exposed to various methods such as flashcards and songs. This problem led the researchers to develop a model based on the ADDIE framework. The application allowed English word videos and audio to move in sync with the images displayed. Scanning automatically triggered the display of the video on the smartphone screen. The findings indicated that AR technology was very effective for preschoolers, as it improved their test scores. The results showed significant differences between pre-test and post-test scores, with pre-test scores ranging from 0% to 65% and post-test scores from 55% to 100%. AR technology helped children read English words more easily, contributing to a higher level of English literacy.

A previous study also investigated the use of the ChineseSkill application to improve students' speaking abilities in learning Mandarin (Juan Christian et al., 2021). This application was chosen due to its diverse topics and features, such as voice recordings and vocabulary translations displayed on smartphones. The study revealed an increase of 8.68% in pronunciation accuracy and 10.91% in fluency between pre- and post-tests. A total of 29 students (94.35%) reported being engaged and motivated by the dialogue sections, which encouraged them to improve their speaking skills. Thus, AR technology made Mandarin learning more effective and helped students enhance their speaking proficiency.

Augmented Reality Technology in Mathematics

In addition, a previous study explored number learning in German using the AR application GermanDeutch (Intan Umaira et al., 2022). This application was developed to enhance students' knowledge of German number pronunciation and spelling. The researchers usedARGermanDeutchwith cards and a "BOOK" application, both of which projected 3D German number spellings in a virtual environment. This application made learning German numbers more enjoyable, especially since it was accompanied by audio. The findings showed that 70% of students aged 16 to 20, 20% of parents over 30, and 10% of teachers over 30 expressed interest in learning AR in the context of German numbers. However, the percentage of students was the highest compared to that of parents and teachers. Therefore, virtual learning can improve students' performance in learning German.

Finally, a study by Nor Najwa Arifah & Fariza Khalid (2019) examined the effectiveness of AR in enhancing basic mathematics concept comprehension. The study aimed to identify the effectiveness of AR in improving students' performance and skills, particularly in arranging number patterns. Data was gathered through pre- and post-tests conducted with 20 Year 2 students. The findings showed a pre-test pass rate of only 10%, compared to a post-test pass rate of 100%. This revealed a 90% increase in the number of students passing. The use of AR technology helped students solve number pattern questions quickly and accurately. Thus, AR technology effectively enhanced students' mastery of basic mathematical concepts.

In conclusion, technological advancements are undeniably vital in modern life. This is because technology serves as a foundation for human civilization's progress. In education, the use of technology, such as information communication technologies (ICT), is a suitable medium for teaching in line with the times. The rapid growth of advanced technology, often used by society to access information quickly, benefits both teachers and students in physical and online teaching and learning (PdP). Therefore, the application of technologies like Augmented Reality (AR) brings significant advantages to national development, especially in the field of education.

Previous Studies Related to Augmented Reality Technology in Arabic Language Learning

The advancement of information and communication technology has opened many opportunities for students and educators to improve their performance in the field of education. In line with this, modern education must be aligned with the priorities and needs of society. Moreover, the development of the nation has allowed information to be disseminated with just a click of a button, eliminating the need to search for information through traditional means like libraries. This technological expansion has permeated students' lives, whether at school or higher learning institutions (IPTA/IPTS). The use of advanced technology is key to stimulating their thinking skills, especially in teaching and learning processes (PdP). Furthermore, students are increasingly exposed to game-based learning, a technique that helps enhance their potential and quality (Alias, 2005). With this technology, students can access available resources quickly, fostering a greater interest in mastering knowledge. Therefore, augmented reality technology should be introduced to students to simplify learning.

Augmented Reality Technology in Arabic Language Learning

Previous research has shown the successful integration of augmented reality (AR) technology in Arabic language learning through the development of the Durus Al-Lughah Volume 1 application (Ady Fauzan et al., 2020). Using Unity 3D, the application includes features like a menu, a scanning function for flashcards, and displays 3D objects, offering a combination of video, images, and audio for enhanced learning. A similar study focused on the Arabicapplication (Nurhazarifah et al., 2017), developed with the ADDIE method, which improved student engagement and understanding for children aged 5 to 7. The study found that 60% of students had experience with AR and responded positively, indicating that AR technology enhances classroom participation and simplifies learning Arabic. Overall, AR is seen as a useful and engaging tool for Arabic language education.The findings revealed that 11 respondents were aware of AR technology, and 60% had previously tried several AR-related applications. Most of them indicated that AR technology would be useful in the future (mean score = 4.40). Additionally, the mean score of 4.46 recorded that students would become more active in class when using the ARabic application. Furthermore, most respondents indicated that the application was easy to use (mean score = 2.67), and they also agreed that AR was highly engaging for students (mean score = 4.60). Therefore, the ARabic application provides substantial benefits to students, particularly in learning Arabic.

A study by Mohd Kamarul Azhar et al. (2019) explored the use of the BAAR (Arabic Reading and Speaking Skills Augmented Reality) application to enhance Arabic proficiency among Year 4 students in Johor. Grounded in constructivist learning theory, the mobile AR tool was designed to improve reading and speaking skills within the j-QAF program. The application engaged students through activities such as observing and pronouncing Arabic animal names, using them in sentences, and applying their knowledge in songs. Pre- and post-tests showed significant improvements, with students' reading skills improving by 16% to 35%. Additionally, 60% of respondents found the 3D BAAR app engaging, making it an effective tool for learning Arabic.

Additionally, a survey of 260 KAFA Arabic language teachers in Kelantan was conducted to explore the use of AR technology in Arabic language education (Mohd Akashah et al., 2022). The researchers found that available teaching aids remained limited and fell short of their intended goals. To address this, a quantitative descriptive approach was employed to analyze the data, which was processed using IBM SPSS statistical software. The results revealed that 52.1% of KAFA Arabic language teachers used mobile devices as teaching aids in Arabic language instruction. Many teachers had transitioned from textbooks to AR technology because they found that many students struggled to memorize Arabic vocabulary (72.4%). Consequently, KAFA Arabic language teachers used AR applications in the teaching and learning process because it was easier for students to understand (mean score = 8.43). Thus, AR technology helped students improve their ability to memorize Arabic KAFA vocabulary.

In conclusion, optimizing the use of technology makes learning more engaging. Technological tools provide educators with various teaching methods and evaluation processes that keep pace with the changing times (Sarah Alia Mohamed Faizal & Nor Hafizah Adnan, 2021). Moreover, students tend to interact more easily when using

innovative, interactive media rather than traditional in-class communication methods (Rohaila Mohamed Rosly & Fariza Khalid, 2017). Therefore, modern technology advancements should be integrated into teaching to improve the quality of education among the younger generation.

Research Methods:-

The methodology of this study was designed to evaluate the need analysis for specific content within the AR-Mufradat application usage among 30students at SekolahRendah Sri Al-Amin Bangi. The study employed a quantitative approach, collecting data through surveys distributed to Year 5 students. These surveys aimed to gather detailed insights into the students' experiences and perceptions of using mobile devices for educational purposes, as well as their feedback on the content provided by the AR-Mufradat application. By using structured questionnaires, the researchers were able to capture a wide range of responses, focusing on various aspects such as the practicality of the app, user engagement, and the effectiveness of integrating AR technology in Arabic language learning.

Data collection involved gathering responses from a significant sample of students to ensure that the findings reflected the broader student body at the school. The survey questions were designed to gauge the students' interaction with mobile devices, specifically smartphones, in the context of learning, as well as their preferences regarding different types of AR-enhanced content. This allowed the researchers to assess how mobile devices facilitated or hindered the learning process and what types of content, such as animations, 3D images, and pronunciation aids, were most beneficial for the students' understanding and retention of Arabic vocabulary.

In analyzing the collected data, SPSS were used to measure the mean scores and standard deviations of the responses, which provided a clear interpretation of the students' needs. The study focused on sub-construct such as pronunciation, spelling, and meaning of words, as well as the design elements like menus, backgrounds, and navigation buttons in the AR-Mufradat application. The findings demonstrated a high level of acceptance and effectiveness of the application, which was particularly supported by the statistical evidence showing that students responded positively to the inclusion of AR technology in their learning process.

Results and Findings:-

Table 1 below presents the findings on the content requirements included in the AR-Mufradat application, showing frequency, percentage, mean, standard deviation, and interpretation among Year 5 students at SekolahRendah Sri Al-Amin Bangi. The researcher analyzed that the overall mean for the content requirements in the AR-Mufradat application was (mean=4.45) with a standard deviation (SD=0.70), indicating a high mean interpretation level.

Item	**Frequency & Percentage**					**Mean**	**SD**	**Interpretation**
	SA	**A**	**NS**	**D**	**SD**			
Word Pronunciation	22 73.3%	8 26.7%	0 0.0%	0 0.0%	0 0.0%	4.73	0.45	High
Word Spelling	16 53.3%	12 40.0%	1 3.3%	1 3.3%	0 0.0%	4.43	0.73	High
Word Meaning	19 63.3%	8 26.7%	3 10.0%	0 0.0%	0 0.0%	4.53	0.68	High
Menu Display	14 46.7%	11 36.7%	4 13.3%	1 3.3%	0 0.0%	4.27	0.83	High
Background	19 63.3%	10 33.3%	1 3.3%	0 0.0%	0 0.0%	4.60	0.56	High
Navigation Button	14 46.7%	12 40.0%	4 13.3%	0 0.0%	0 0.0%	4.33	0.71	High
Animation	17 56.7%	9 30.0%	3 10.0%	1 3.3%	0 0.0%	4.40	0.81	High
3D Images	13 43.3%	13 43.3%	3 10.0%	1 3.3%	0 0.0%	4.27	0.79	High
Overall Mean						**4.45**	**0.70**	**High**

Table 1:- Student Feedback on Content Requirements for the AR-Mufradat Application"

The results show that all eight items related to the content requirements in the AR-Mufradat application were rated with a high mean interpretation (mean=4.45, SD=0.70). The items included word pronunciation, spelling, meaning, menu display, background, navigation button, animation, and 3D images.Firstly, 22 students (73.3%) strongly agreed that word pronunciation was necessary, and 8 students (26.7%) agreed. The mean score was (mean=4.73, SD=0.45). Similarly, 16 students (53.3%) strongly agreed that spelling was important, while 12 students (40.0%) agreed (mean=4.43, SD=0.73).

Additionally, 19 students (63.3%) strongly agreed that word meaning was essential, and 8 students (26.7%) agreed. The mean score was (mean=4.53, SD=0.68). For menu display, 14 students (46.7%) strongly agreed, and 11 students (36.7%) agreed (mean=4.27, SD=0.83).Regarding the background, 19 students (63.3%) strongly agreed, and 10 students (33.3%) agreed (mean=4.60, SD=0.56). For the navigation button, 14 students (46.7%) strongly agreed, and 12 students (40.0%) agreed (mean=4.33, SD=0.71).In terms of animation, 17 students (56.7%) strongly agreed, and 9 students (30.0%) agreed (mean=4.40, SD=0.81). Finally, for 3D images, 13 students (43.3%) strongly agreed, and 13 students (43.3%) agreed (mean=4.27, SD=0.79).

Overall, the results indicate that Year 5 students at SekolahRendah Sri Al-Amin Bangi had a high level of need for the content included in the AR-Mufradat application. Most students were open to using AR-Mufradat technology for Arabic language learning, emphasizing the importance of creativity in classroom teaching to make learning more engaging. The study shows that the AR-Mufradat application received positive feedback regarding the need for word pronunciation. Pronunciation plays a crucial role in helping students articulate Arabic words correctly, which has a significant positive impact, especially in language learning. The AR-Mufradat application incorporates audio features, where the pronunciation of Arabic words is repeated three times, allowing students to clearly repeat the words. This improves both their listening and speaking skills, aligning with the idea that listening is the first skill children develop at an early age (Ali Al-Madkur, 1991). Additionally, the audio feature helps students remember Arabic words more effectively. Therefore, the inclusion of word pronunciation in the AR-Mufradat application enhances students' language learning experience.

The study also indicates that spelling is considered a high-priority feature. Mastery of Arabic grammar relies heavily on accurate spelling, which involves not just correct letter formation but also attention to diacritics (Anuar, 2019). Inaccurate spelling can alter the meaning of a word, causing confusion. The AR-Mufradat application enables students to learn proper spelling through visual aids. This feature is crucial for maintaining the correct meaning of Arabic words, making it an essential component of the application.

The meaning of words is another key feature included in the AR-Mufradat application, offering explanations in Malay, English, and Arabic. This multilingual approach facilitates easier learning, as meaningful information is generally easier to remember (Che Radiah &Norhayuza, 2011). Limited vocabulary can restrict communication efficiency in any language (AlQahtani, 2015). By providing word meanings in multiple languages, the AR-Mufradat application broadens students' understanding, particularly in Arabic and English. Including this feature is highly beneficial for vocabulary acquisition and language mastery.

The menu display is also highlighted as an important feature, providing students with a clear structure and guidance throughout their learning process. A well-organized menu offers easy access to instructions and functionalities, aiding the overall learning experience (Azzan et al., 2020). The inclusion of bilingual options in the menu (Malay and English) helps prevent confusion and enhances comprehension (Mat Nashir et al., 2021), making it a vital component of the AR-Mufradat application.

In addition, AR technology, particularly through the use of colored backgrounds, helps make the learning process more engaging and effective. Visual elements like graphics and color can capture students' attention and improve their understanding (Che Suriani, 2020). The background feature in the AR-Mufradat application is designed to stimulate students' imagination and maintain their focus, making it a highly rated aspect of the application.Navigation buttons are another essential feature, designed to facilitate students' learning experience. In the AR-Mufradat application, these buttons are paired with audio that pronounces Arabic vocabulary, making it easier for students to understand the language. The navigation buttons, designed with symbols like the Saudi Arabian flag, also provide visual cues to guide students through the application.Animations are a highly engaging feature, as they combine visual and audio elements to make learning more enjoyable. Animations help maintain students' focus and clarify concepts that might be difficult to grasp with static images (Shofiyyah et al., 2020). The

use of animations in the AR-Mufradat application has been shown to enhance students' listening and speaking skills, as well as improve their retention of learned material (Rosni, 2009; Jamalludin&Zaidatun, 2003).

Finally, the use of 3D images in the AR-Mufradat application allows students to interact with both virtual and real-world elements in real-time, making the learning process more dynamic and engaging (Azfar & Dayang, 2013). The inclusion of 3D visuals helps students learn Arabic vocabulary more effectively by providing a more immersive learning experience. This feature is particularly appealing to younger students, who are naturally drawn to bright colors and interactive elements (Zulfadzli& Noor Anida, 2023). Thus, the incorporation of 3D images is a crucial aspect of the AR-Mufradat application.

Conclusion:-

In conclusion, this study reveals a high level of need for the use of mobile devices among students at SekolahRendah Sri Al-Amin Bangi, particularly in relation to the AR-Mufradat application content. The positive response from students towards AR-Mufradat indicates its effectiveness in enhancing motivation and learning engagement in Arabic language lessons. By integrating AR technology into the classroom, students can improve their understanding, foster creative thinking, and transform their learning experiences. The use of AR applications like AR-Mufradat has the potential to make learning more enjoyable, interactive, and effective, as it incorporates elements such as video, animation, and audio, which help students retain information and remain engaged. Additionally, AR technology offers a modern alternative to traditional teaching methods, leading to positive outcomes in student performance and interest.

The findings suggest that AR-Mufradat is beneficial for developing students' knowledge, particularly in Arabic, and should be further explored in primary school settings to make learning more engaging. Teachers should also align the content with the KSSR syllabus to ensure clarity and effectiveness in the learning process. Ultimately, the AR-Mufradat application enhances the overall learning experience, making it a valuable tool for improving Arabic language education at the primary school level.

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