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ADVANCING EDUCATIONAL PRACTICES: IMPLEMENTATION AND IMPACT OF VIRTUAL REALITY IN ISLAMIC RELIGIOUS EDUCATION

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ABSTRACT
This research explores the creation of Virtual Reality (VR)-based learning tools for Islamic religious education in Integrated Islamic elementary schools. Following a Research and Development (R&D) methodology, the study employs a six-stage approach: investigation, strategizing, enhancement, assessment, realization, and evaluation (ISI-ARE). The resulting product, a VR-based educational module for teaching the *Hajj*, undergoes rigorous validation by two VR and animation experts, along with an Islamic religious education teacher. Subsequently, the VR-based learning material is tested on 140 students across four Integrated Islamic Elementary Schools (SDIT) in Padang. Student responses are meticulously collected through questionnaires and analyzed using SPSS version 26.0 software.The outcomes affirm unanimous validation from the three evaluators, establishing the suitability of this media for instructional purposes. Additionally, the analysis identifies eight key aspects of student feedback related to VR-based learning, including comprehensibility of materials, clarity of instructional content, visually stimulating presentation, enjoyable and engaging experiences, a sense of realism, eagerness for repeated VR media utilization, and user-friendly accessibility. This pioneering use of VR-based learning significantly enhances the concreteness, authenticity, and enjoyment of the learning process, introducing novel dimensions and experiences to students. It emphasizes the need to continue designing and developing various VR-based resources to strengthen the teaching of Islamic principles.

Keywords: Concrete Learning, ISI-ARE Model, Virtual reality, *Hajj*

ABSTRAK
Penelitian ini mengembangkan alat pembelajaran berbasis Realitas Virtual (VR) untuk pendidikan agama Islam di sekolah dasar Islam terpadu. Penelitian dan Pengembangan (R&D) ini mengadopsi pendekatan enam tahap: investigation, strategizing, enhancement, assessment, realization, and evaluation (ISI-ARE). Hasil penelitian menunjukan, modul pendidikan berbasis VR untuk mengajar manasik Haji divalidasi oleh dua ahli VR, animasi, dan guru pendidikan agama Islam. Materi pembelajaran berbasis VR diujikan kepada 140 peserta didik di empat sekolah dasar Islam terpadu (SDIT) di Padang. Respon peserta didik dikumpulkan secara teliti melalui kuesioner dan hasilnya

dianalisis menggunakan perangkat lunak SPSS versi 26.0. Hasil penelitian menegaskan validasi dari ketiga ahli, kesesuaian media ini untuk tujuan instruksional, pemahaman materi, kejelasan konten instruksional, presentasi visual yang merangsang, pengalaman belajar yang menyenangkan dan menarik, rasa realisme, keinginan untuk menggunakan media VR berulang kali, dan keterjangkauan yang ramah pengguna. Penggunaan pionir pembelajaran berbasis VR ini secara signifikan meningkatkan hasil objek konkrit, asli, dan senang dalam proses pembelajaran bagi para siswa.

Kata Kunci: Pembelajaran Konkrit, model ISI-ARE, Virtual reality, Haji

INTRODUCTION

The ongoing, substantial advancement of technology undeniably exerts a profound influence on the progression of the field of education (Cook et al., 2019; McGovern et al., 2020). It is a factual reality that in today's educational landscape, nearly all instructional tools are reliant on technology across three crucial phases: planning, the learning process, and the assessment process, a point underscored by (Elmqaddem, 2019; Fabriar, 2019). Among these three educational stages, the integration of technology into the learning process consistently remains an area of significant interest for exploration, as highlighted by scholars (Liu et al., 2019; Marks & Thomas, 2022; Radianti et al., 2020). The outcomes of research investigations pertaining to learning resources hold a position of eager anticipation among a spectrum of educational stakeholders, including academics, lecturers, teachers, and policymakers. These findings are pivotal as they serve as the fundamental reference point for the innovation and enhancement of instructional materials delivered in the classroom (Ahir et al., 2020; Huang et al., 2019; Lee et al., 2022).

In the classroom, employing instructional media to facilitate the delivery of educational materials is considered a fundamental requirement. A teacher's effectiveness in conveying instructional content is significantly enhanced when supplemented by teaching media. Historical research findings underscore the positive impact of using teaching media within the classroom environment, as highlighted Noori et al., (2022) active classroom atmosphere Roberts et al., (2023); Tak et al., (2023), joyful learners Serevina et al., (2022), as well as improvement of learners' learning achievement (Chytas et al., 2022; Sun & Pan, 2021; Villena-Taranilla et al., 2022). Conversely, traditional teaching methods that solely rely on verbal explanations and lectures, often accompanied by PowerPoint presentations, tend to result in a monotonous educational experience (Gnanadurai et al., 2022), passive learners (Yang & Miang Goh, 2022) and unsatisfying learning achievement (Hamilton et al., 2021; Lopez et al., 2021). Consequently, the integration of instructional media in the teaching and learning process is an indispensable means of achieving educational objectives.

In general, distinctions naturally exist between young learners and adults with regard to the learning process. At the elementary level, the learning experience should be characterized by enjoyment and engagement, as noted by Cai, (2021); Oberle et al., (2021) Furthermore, the educational materials provided should possess a tangible and comprehensible quality, as emphasized Lin et al., (2022) and avoid abstract materials delivery (Green et al., 2021; Vidergor, 2021). In order to create an optimal teaching and learning environment, teachers need to be mindful of selecting appropriate teaching methods and learning resources that cater to the learners' developmental stage, thus instilling positive psychological effects and fostering enjoyable learning experiences.

Within the context of elementary school, one of the essential subjects is Islamic religion, which includes the study of the *Hajj* pilgrimage. Learners are expected not only to acquire knowledge about *Hajj* but also to gain initial skills required to perform the pilgrimage, in accordance with (Hatim, 2018; Syamsuar & Reflianto, 2019). As *Hajj* represents one of the fundamental pillars of Islam, it is imperative to include it in the school curriculum. Traditionally, the teaching and learning of *Hajj*-related topics primarily relied on conventional methods, such

as lectures delivered in a classroom setting (Afiyah & Usman, (2022). Other approaches included showing prerecorded *Hajj* videos for students and organizing practical *Hajj* exercises in specific locations, such as mosques or nearby *Hajj* dorms.

The conventional teaching and learning for *Hajj* as shown in the images cannot be performed due to the COVID-19 that the teaching process is mostly conducted through online platforms (Agarwal & Kaushik, 2020; Mulyono et al., 2021). Besides, schools that start conventional meetings limit the number of students who can attend the schools. Thus, referring to those issues, researchers designed technology-based learning media of Virtual Reality as a teaching aid for teachers so that it is easy for them to deliver teaching materials in elementary schools.

By implementing VR in *Hajj* learning for elementary school, students could experience an insightful and joyful learning process compared to the traditional method. Students can only execute *Hajj* practice by imagining the real process through the traditional method. However, VR creates a reality-like environment of *Hajj* rituals through virtual platforms during the learning process for elementary school students (Badiozaman et al., 2022; Yeh et al., 2022). This learning technology has been widely used by teachers as a learning medium. It would be a fresh learning method for practicing *Hajj* specifically for elementary school students.

VR is regarded as an advanced technology that connects someone to interact with a loop simulated through a computer or other similar devices (Araiza-Alba et al., 2021; Makransky & Petersen, 2021). It can also be simply defined as technology-based media that describes an environment through three dimensions generated by a computer and can interact directly with its users. The virtues of VR make it potential to be a learning media such as its ability to present the teaching materials through three dimensions as well as various audiovisual effects that learners experience real-like learning process (Fromm et al., 2021; Syafril et al., 2021).

Previous studies related to the effect of using VR as learning media have been widely conducted. Scholars have reported making use of VR in science classrooms Kersting et al., (2021); Parong & Mayer, (2018); VR in Engineering Kumar et al., (2021); Singh et al., (2021); Udeozor et al., (2021), Arts and Animation (Çakıroğlu et al., 2021; Gan et al., 2021; Gong, 2021; Kim & Lee, 2022). Some studies conclude that making use of VR for learning media affects the classroom atmosphere and offers several advantages like active learners' participation, enjoyable learning, easiness to understand teaching materials, and improvement in learning outcomes. However, making use of VR in Islamic religious education classrooms in elementary schools has not been promoted. Some studies related to using VR in Islamic religious education classrooms have been conducted namely making use of VR in Moral and Characters lesson Herfandi et al., (2020) and VR in histories of prophets (Zainal Abidin & Razak, 2019). The studies reveal that making use of VR in Islamic religious education affects the learning atmosphere, improves learners' motivation, and increases learning outcomes significantly.

Studies related to making use of VR in Islamic religious classrooms have been conducted, yet the number of studies is not significant. Making use of VR related to performing the *Hajj* has not been found. Thus, this study is aimed at designing VR-based learning media that facilitates the learning process during the pandemic. It is assumed that the use of VR in introducing rituals of *Hajj* helps learners to understand the performance accordingly. Moreover, it is believed that VR could bring students to real-like *Hajj* rituals that the abstract concept of *Hajj* could be avoided.

METHOD

This study employs the Research and Development method consisting of six stages, namely investigation, strategy, improvement, assessment, realization, and estimation (ISI-ARE) (Pahrudin et al., 2019). The details of the stages are further elaborated as follows. The first stage,

Investigation, initially begins with data collection related to issues encountered by teachers and learners in modelling *Hajj* performance. The investigation is conducted through interviews and direct observation in four Integrated Islamic Elementary Schools in Padang, Indonesia. In this initial stage, needs analysis is utilized as the basis of instrument production. Based on the analysis, it is revealed that teachers and learners require technology-based learning media in their Islamic Religious Education subject, especially to introduce and model *Hajj* performance. The second stage, Strategy, is the phase to design and formulate VR-based learning media. This design is based on the development of elementary school students and the needs related to learning materials for the implementation of the *Hajj*. The research was conducted with a team of six professionals from various disciplines, namely an educational psychologist, an Islamic teacher, an Islamic education lecturer, an information technology expert, an animator, and an expert in curriculum and pedagogy. After creating the design concept, the media was created for three months.

Third; improvement, the initial trial of VR-based learning media was conducted at this stage. This media was first released and used in a class of twenty students in two Integrated Islamic Elementary Schools (SDIT). Fourth; assessment, there are two stages of assessment carried out, namely: i) the product is assessed by three experts, ii) improving the quality of the product according to the recommendations of the three experts followed by a second assessment after the product revision is completed. The product was declared feasible and valid for use in the classroom by the experts after the second assessment.

The fifth stage is realization. At this stage, the product has been completed and is ready to be used by teachers in the process of learning Islam in the classroom. One hundred and forty students in four Integrated Islamic Elementary Schools (SDIT) to test the product. All respondents were selected using a simple random sampling technique from a total population of 220 students who were in grade six in the four schools where this research was carried out. After experiencing to use of the VR-based learning process on the material of the *Hajj*, the students are required to respond to questionnaires related to their experience of learning with VR media. All questionnaire data were analysed by finding the mean value using SPSS software version 26.0. All analyses of learners' responses to the product will be described in the findings and discussion section of this article. The sixth stage is estimation, the last stage of the study. In this stage the evaluation of the product after the final revision is made and the product will be used permanently by the teacher. To make it clearer, a detailed explanation of the six stages of this research is described in Figure 1.

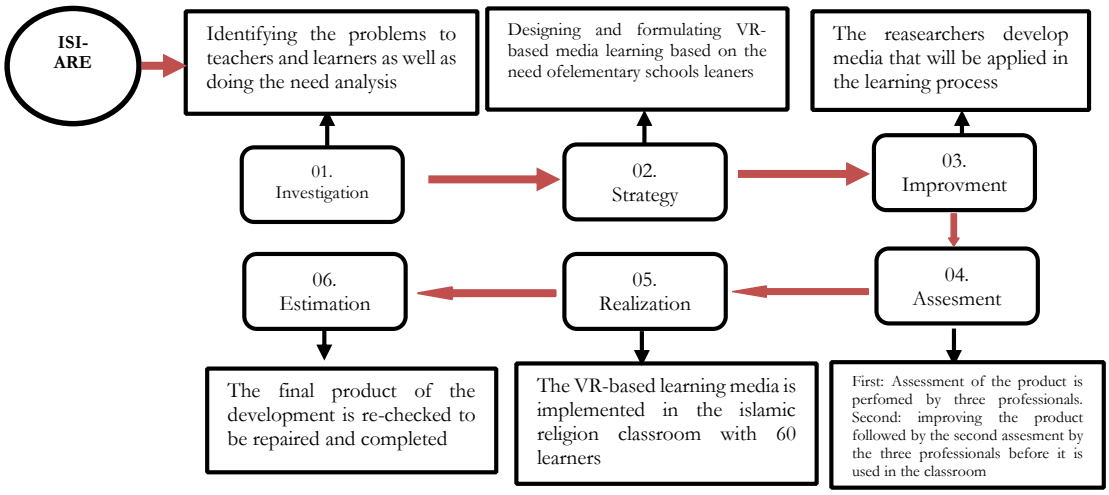

Figure 1. Six Stages in Designing VR-Based Learning Media

RESULTS AND DISCUSSION

This discussion and findings section is divided into two parts. The first part will elaborate on all features and content of the VR-based learning media. The VR is used to facilitate learners to understand the rituals of *Hajj*. The second part will be about learners' responses related to their psychological effects after experiencing learning by using VR as learning media.

Making Use of VR-based Learning Media in the Subject of Islamic Religion

Although making use of VR as a learning medium in the education field is common, VR as a learning medium in Islamic religious education is not popular. Many Islamic religious education teachers may not be familiar with the learning media, particularly when the media is used to exhibit rituals of *Hajj*. Thus, VR might be regarded as the latest learning media in this context. There are five steps conducted when the learning media is used to activate the application so that the media can properly function. The following paragraphs will be related to the five steps accompanied by pictures for a better explanation.

First, learners put the VR glasses on their faces properly. The glasses will function to direct the user's head and eye movement so that they can concentrate in the displayed virtual world. With the help of these glasses, learners feel as if they are actually in the place and state of the material being studied. The glasses also function to help learners see all the features and materials in the application. Second, after the learners put the glasses on their faces, there is an "ON" button that all the activities will turn on. All control devices have been labelled based on their functions so that learners easily operate the devices. These two steps can be seen in figure 2.

Figure. 2 Plot of Making Use of VR as a Learning Medium

Third, learners could select the available learning materials based on the features of the VR application. The material is initially started by introducing the concept of *Hajj* and the procedures of the rituals in the form of a short narration; i.e. the concept of *Hajj*, terms, and conditions of *Hajj*, obligation, and sunnah in *Hajj*, prohibitions in *Hajj*, and other related information about the Islamic pilgrimage as it is shown in figure 3.

Figure. 3 Short Material Narration in the VR Feature

Fourth after the learners are exposed to the features and the procedures of *Hajj*, learners are directed to virtually visit some sites which are compulsory to attend during the rituals; such as visiting and w*uquf* in Kaaba, spending one night in Arafah, *Sai* in Safa and Marwa hills and other sites. All the sites are completely presented in the VR features. To move from one to

another site, learners are simply required to nod their heads and move their eyes in certain directions so that the VR glasses will properly function. Three-dimension pictures are presented to the learners as well and some verses must be recited in every site during the rituals. The visited sites are in accordance with real *Hajj* rituals as can be seen in figure 4.

Figure 4 Features of Sites of *Hajj* in the VR Application

Fifth, to end the ritual activities, the learners can simply press the "off" button which is available on the right side of the glasses.

Effects of Using VR-based Learning Media for Islamic Religion

As previously mentioned, to examine the students' response to making use the VR-based learning media to perform *Hajj*, a trial was conducted to one hundred forty students of sixth grade from four integrated Islamic elementary schools (SDIT). The students were asked to describe their experience in using the VR-based learning media by answering the given questionnaire. The questionnaire consisted of six items and five close-end answers, namely highly disagree, disagree, less disagree, agree, and highly agree. The response of the students can be described through the following Table 1.

Table 1. Effects of Making Use of VR-based Learning Media

No	Learners' responses of making use of the VR-based media in the classroom	N =140 (respondent) Mean	Category
1.	easiness to comprehend the learning material	4.680	Very high
2.	clarity to visualize the learning material	4.638	Very high
3.	Interesting presentation of the learning material	4.659	Very high
4.	Enjoyable learning process	4.638	Very high
5.	Fun Islamic education learning material	4.489	Height
6.	Experiencing-like *Hajj* procession	3.574	Height
7.	willingness to reuse the VR for learning media	4.787	Very high
8.	friendly use of VR-based learning media	3.127	Height

Referring to the analysis result as shown in Table 1 above, it can be explained that overall students give a good response regarding the use of VR-based learning media. The good response can be seen from the six results of the analysis of questionnaire items with mean values from points 4.489 to 4.787 as shown in the table above. Although two items get a mean analysis value between 3.128 to 3.574, the value is still in the category of a fairly high response and satisfaction stage. This means that the use of VR-based media in the Islamic religious education learning process has provided a positive attitude and new experiences for students. The findings of this study are reinforced by several previous studies which found that VR technology is proven to have a positive attitude effect on students such as enjoying the learning process because learning using VR is never boring (Baker & Jenney, 2023; Huttar & BrintzenhofeSzoc, 2020). Besides, learning using VR media has provided a real experience to students because the material is displayed concretely (Kavanagh et al., 2017).

One of the goals of the learning process is to provide new knowledge and experiences to students. Thus, all the components involved such as teachers, materials, and media used must be an integrated unit so that learning objectives can be properly achieved (Asmaldi et al., 2022).

In the context of learning Islamic religious education, especially the material on implementing the *Hajj* pilgrimage as the issue in this article, the learning process has mostly been carried out using classical methods such as lecturing, presenting, or discussing the related theme in front of the class. Classical teaching should not be an issue, however, if the teacher can provide material by integrating technology such as using VR media, it will certainly create a different learning atmosphere (Jenney et al., 2023). As it has been proven in the results of this study, the learning process carried out with VR media gives students very positive responses such as happy and fun learning, willingness to learn more about the presenting materials, easiness of understanding the learning materials, and experiencing real-like learning materials. As previous researchers have found, teachers need to make learning fun so that it can positively change students' learning attitudes (Demitriadou et al., 2020; Jang et al., 2021).

The use of technology as a learning medium is the best choice that teachers can make in the era of digital learning (Chen & Hsu, 2020; Reeves et al., 2021). However, in the context of Islamic religious education, of course, not all materials can be delivered based on technology help, for example, the monotheism (tauhid) concept which is more abstract. However, learning that requires a concrete motor movement process such as prayer, ablution (wudhu'), and tayammum material certainly requires good and appropriate media, so that students easily understand the material, enjoy learning, are active, and can increase motivation and interest in learning.

The Ritual of *Hajj* is one of the compulsory materials learned by elementary school students. Thus, it will be difficult for learners to understand the abstract concept and material presentation if it is delivered through the classical teaching method. The two prominent instruments which are interrelated in Islamic religious education are the availability of the media and teachers. Teachers are expected to have the capability and competency to operate advanced technology-based learning media so that they can integrate ICT into their teaching and learning process (Engkizar et al., 2018; Syafril et al., 2021). Issues related to Islamic religious education teachers' low competency in mastering advanced technology are no longer new, they tend to teach the material through classical delivery; and lectures (Engkizar et al., 2021). Lack of training related to advanced technology use in the classroom Karakostantaki & Stavrianos, (2021), lack of interest in improving their skills in the ICT field Fahmi et al., (2021), cause the low quality of teaching and learning process, boring classroom atmosphere, and dull learning process (Idris et al., 2019).

This research has succeeded in designing learning media based on VR technology in Islamic religious education learning. As previously explained, the material for the implementation of the rituals of *Hajj* is always taught classically, but the presence of learning media based on VR technology has provided learning media innovations that can be another alternative for teachers as a medium for learning Islam. The use that technology in learning the procedures for carrying out *Hajj* can provide new experiences and give a positive impression to students. VR technology-based media aims to visualize abstract material to be seen in real terms, such learning is suitable for use in elementary school students. In the context of psychology, learning at this age should be concrete, and abstract learning should be avoided (Lei et al., 2018; Yaremych & Persky, 2019).

Finally, the findings reveal that making use of VR-based learning media has positive psychological effects on learners. It shows that most learners strongly agree that the material is delivered using learning media based on VR technology, and seems to give a positive impression on the psychological atmosphere of students in learning. The impression is felt by the ease with which students understand the material because it is displayed clearly and attractively. Participants do not get bored quickly and learning becomes more enjoyable. Besides that, students were also impressed that VR technology-based learning media had

brought them as if they were in a real atmosphere, even overall students agreed and wanted to re-use VR-based learning media because it is not difficult to operate. This is indeed in line with various expert views and research findings which state that learning situations are influenced by various factors including competent teachers Blömeke et al., (2020), student's motivation and interest in learning Somers & Llinares, (2021), selection of appropriate methods Zendler & Greiner, (2020) and availability of media that can facilitate learning (Naik et al., 2020). If all these instruments are available, it can be ensured that the learning process and results are achieved properly following the objectives.

CONCLUSION

This study explores the development of Virtual Reality (VR)-based learning tools for Islamic religious education in Integrated Islamic elementary schools. The findings reveal that the VR-based learning media designed in this research contributes scientifically to inducing psychological effects on students during the teaching and learning process. This suggests that leveraging VR-based learning media can serve as an alternative for teachers to facilitate the teaching and learning process, where the media can be utilized for remote or hybrid classrooms. With the rapid evolution of technology and its psychological impact on individuals, ongoing innovation in the educational field becomes imperative to keep pace with technological advancements. Teachers, as mediators, motivators, and agents of change, play a crucial role in adapting to this rapid growth, enabling them to make significant contributions to the educational landscape.

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