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Transforming Tawhid Learning with Augmented Reality: A Case Study in Madrasah Ibtidaiyah

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Abstract— The concept of Tawhid is the core of Islamic teachings that every Muslim must understand profoundly, especially from an early age. However, teaching Tawhid often faces significant challenges because of its abstract nature, which makes it difficult for students at the Madrasah Ibtidaiyah level to comprehend. This research aims to overcome this problem by utilizing Augmented Reality (AR) technology as an interactive and engaging learning aid. This research employed a case study method at Madrasah Ibtidaiyah to design, develop, and test the effectiveness of AR-based Tawhid learning materials. The initial stage of the research involved a needs analysis through surveys and interviews with teachers and students to identify challenges in teaching Tawhid. Based on the results of this analysis, AR-based Tawhid learning materials were developed and implemented. The effectiveness testing was carried out by comparing students' understanding before and after using AR through pre-tests and post-tests. Additionally, feedback from teachers and students was also collected to evaluate the user experience and the applicability of this technology in the context of daily learning. The results showed that the use of AR technology significantly improved students' understanding of the Tawhid concept. Students became more interested and motivated to learn, and the abstract concepts of Tawhid could be understood more concretely and visually. Positive feedback from teachers and students also affirmed that AR is an effective and enjoyable tool in religious education. Thus, this research concludes that AR technology has great potential to be applied in Islamic education, particularly in teaching abstract concepts such as Tawhid. The use of AR not only enhances students' understanding but also makes the teaching and learning process more interactive and engaging.

Index Terms— Augmented Reality, Tawhid, Islamic Education, Madrasah Ibtidaiyah, Educational Technology

I. INTRODUCTION

Islamic education plays a crucial role in shaping the morals and personalities of the younger generation (1). One of the core teachings of Islam that must be deeply understood by every Muslim is the concept of Tawhid (2). Tawhid is the understanding of the Oneness of Allah and is the fundamental basis of Islamic beliefs and practices (3). Therefore, a strong understanding of this concept from an early age is essential. However, teaching Tawhid often faces significant challenges, especially at the Madrasah Ibtidaiyah level, due to its abstract nature and complexity, which makes it difficult for children to comprehend.

Information and communication technology, particularly Augmented Reality (AR) technology, has shown its potential in improving the quality of learning in various fields. AR can combine the real world with virtual objects, creating an interactive and engaging learning experience (4). In the context of Islamic education, AR can be used to make abstract concepts such as Tawhid more concrete and easier for students to understand. However, research examining the use of AR technology in teaching the concept of Tawhid is still very limited.

The use of AR in Tawhid learning can help students visualize abstract concepts of divinity and enhance their understanding of the fundamental principles in Islam. With interactive and immersive visualizations, students can more easily connect the concept of Tawhid to their daily lives, thus deepening their appreciation of the spiritual values in Islamic teachings. As stated by (5), AR provides a rich and engaging learning environment, which can increase student motivation and facilitate better understanding of abstract concepts.

Teaching the concept of Tawhid at Madrasah Ibtidaiyah often faces various challenges. Students often find it difficult to understand this abstract and complex concept through conventional teaching methods alone. This leads to a lack of depth in students' understanding of Tawhid and a lack of practical application in their daily lives. Traditional lecture-based and rote memorization teaching methods tend to be less effective in instilling abstract concepts in children who need a more visual and interactive approach.

Furthermore, students' interest and motivation in learning Tawhid are often low, as they find the monotonous teaching methods boring. However, a good understanding of Tawhid is crucial for developing a strong and solid foundation of faith for every Muslim. Therefore, innovation in teaching methods is needed to enhance students' understanding, interest, and motivation.

This research is also motivated by the research gap in previous studies (6), (7), (8), (9), (10), (11). Although research on the use of technology in education has been widely conducted, studies specifically examining the use of Augmented Reality in teaching religious concepts, particularly Tawhid, are still very limited. Most existing research focuses on the application of AR in the fields of science, mathematics, or language, and only a few explore its potential in religious education. Additionally, existing research tends to emphasize the technical aspects of AR development without thoroughly evaluating its impact on students' understanding of abstract concepts and learning motivation.

This research aims to fill this gap by exploring how the use of Augmented Reality technology can improve students' understanding of the Tawhid concept. The research will examine the design, development, and effectiveness of AR-based Tawhid learning materials in Madrasah Ibtidaiyah, as well as evaluate its impact on students' understanding and learning motivation. Thus, this research is expected to contribute significantly to the development of innovative learning methods in the field of Islamic education and offer an effective solution to existing problems in teaching the Tawhid concept.

Given the potential of Augmented Reality technology to create a more engaging and interactive learning experience, this research aims to explore how the use of AR can improve students' understanding of the Tawhid concept. The research will examine the design, development, and effectiveness of AR-based Tawhid learning materials in Madrasah Ibtidaiyah, as well as evaluate its impact on students' understanding

and learning motivation. Through this approach, it is hoped that effective solutions can be found to overcome existing problems in teaching the Tawhid concept and contribute significantly to the development of innovative learning methods in the field of Islamic education.

II. THEORY

2.1 Tawhid Learning in Islamic Elementary Schools

Tawhid learning in Islamic elementary schools (Madrasah Ibtidaiyah) is an educational process that aims to instill a deep understanding of the concept of the Oneness of God (Tawhid) in young students. At the Madrasah Ibtidaiyah level, which is equivalent to elementary school, the Tawhid learning approach needs to be designed systematically and appealingly to ensure students can effectively understand and internalize the values of Tawhid. Tawhid itself consists of three main components: Tawhid Rububiyyah (Oneness of God in creation and preservation), Tawhid Uluhiyyah (Oneness of God in worship), and Tawhid Asma wa Sifat (Oneness of God in His names and attributes) (12). The main goal of this learning is to ensure that students understand that Allah is the only God worthy of worship, so that they grow with strong faith and are able to live according to Islamic teachings.

The Tawhid learning approach in Madrasah Ibtidaiyah must be holistic, encompassing cognitive, affective, and psychomotor aspects. One effective method is using stories from the Qur'an and Hadith, such as the story of Prophet Ibrahim searching for God, which is not only appealing to children but also helps them understand the concept of Tawhid concretely. Lev Vygotsky in his theory of cognitive development emphasizes the importance of social interaction and scaffolding in children's learning process. Through storytelling, teachers can create a supportive learning environment where students can ask questions and discuss to build their understanding.

Additionally, the use of visual and audio media such as videos, pictures, and religious songs is also very effective in attracting students' interest and helping them remember the concepts taught. Howard Gardner in his theory of multiple intelligences shows that children have various ways of learning, including through visual-spatial intelligence and musical intelligence. Therefore, integrating media in Tawhid learning can help reach students' various types of intelligence and improve their understanding.

Jean Piaget, in his theory of children's cognitive development, emphasizes the importance of concrete experiences in early childhood learning. Therefore, hands-on practice and direct experience methods, such as having students pray, read the Qur'an, and do dhikr, are very important. Through direct practice, students not only learn theoretically but also internalize the values of Tawhid in their daily lives.

The importance of Tawhid learning is also emphasized by (12) in his book “Meta-Science of Tawhid”, where he states that teaching Tawhid at an early age in a structured and appealing way helps build a strong foundation of faith and morals. This prepares students to face future challenges with a solid understanding of the principles of their religion.

Overall, Tawhid learning in Madrasah Ibtidaiyah must be consistent, repetitive, and appropriate to students' cognitive development. This learning not only focuses on the theoretical aspect but also teaches students to feel and apply the values of Tawhid in their daily lives. Thus, students can develop a deep and

solid understanding of Tawhid, which will be an important foundation for their spiritual and moral lives in the future.

2.2 Augmented Reality (AR)

Augmented Reality (AR) technology is one of the technological innovations that offers great opportunities in the world of education, changing the way students interact with learning materials and creating a deeper and more engaging learning experience (13). AR combines digital elements with the real world in real-time, allowing users to see additional information overlaid on their view of the real world. In the context of learning, AR not only enhances student engagement but also helps them understand complex concepts more easily.

2.2.1 Benefits of AR Technology in Learning

Increasing Student Engagement and Motivation: AR can make learning materials more interesting and interactive. For example, using AR, students can see three-dimensional models of human organs or simulations of living history in front of them. This can capture students' attention and make them more motivated to learn. Attention is one of the key elements in increasing student motivation. AR, with its ability to present information visually and interactively, can effectively capture students' attention and maintain their interest in the learning process (14).

Facilitating Understanding of Complex Concepts: Some concepts in science and mathematics are often difficult to understand with text and static images alone. With AR, students can visualize and interact with these objects in three dimensions, facilitating understanding. For example, students can manipulate chemical molecular models, see how atoms interact, or understand the cell division process interactively. This aligns with constructivist learning theory, which emphasizes the importance of concrete and relevant learning experiences. Jean Amalia, in her theory of cognitive development, emphasizes that concrete experiences are very important in early childhood learning (15).

Contextual and Experiential Learning: AR can create contextual and hands-on learning experiences. In history lessons, for example, students can "walk" through ancient archaeological sites and see how buildings and cultures were at that time. This allows students to learn in a more realistic and relevant context, which according to David Kolb's experiential learning theory, is one of the most effective ways to learn. Kolb emphasizes that the most effective learning occurs when students are directly involved in learning experiences, rather than just passively receiving information (16).

Accessibility and Adaptability: AR enables the creation of learning content that can be accessed by various groups of students, including those with special needs. With AR, learning materials can be customized and adapted to individual student needs, helping to create an inclusive learning environment. For example, students with visual impairments can use AR to enlarge text or images, while students with hearing impairments can use subtitles or additional text explanations.

2.2.2 Implementation of AR in Learning

Use of Mobile Applications and Devices: Mobile applications that support AR, such as Google Expeditions or other AR-based learning apps, allow students to easily access AR experiences through their own devices. This makes AR more affordable and easy to implement in the classroom. Teachers can use these apps to set up virtual tours or interactive simulations, allowing students to learn more deeply and enjoyably.

Development of AR Content by Teachers: Teachers can use development tools like Unity or ARKit to create AR content specific to their curriculum. This gives teachers the flexibility to create relevant and contextual materials, and allows them to tailor learning to student needs. By developing their own content, teachers can ensure that the material taught aligns with learning objectives and educational standards.

Infrastructure and Training: To maximize the benefits of AR, schools need to invest in adequate infrastructure, such as strong internet connections and AR-compatible devices. In addition, teachers also need to receive sufficient training in using this technology to effectively integrate it into learning. Proper training will help teachers understand the best ways to leverage AR in the learning process, including how to address any technical issues that may arise.

2.2.3 Challenges in AR Implementation

Although AR offers many benefits, there are some challenges that need to be addressed. One is the potentially high cost of developing and implementing AR technology. Schools need to allocate sufficient budgets to purchase AR devices and applications, as well as for teacher training. Additionally, there are challenges in terms of device availability and technical support. Not all schools have access to advanced technology or the resources needed to effectively implement AR.

Resistance to Change: Another challenge is resistance to change from teachers and students who may be unfamiliar with new technologies. To overcome this, it is important to provide adequate training and support, as well as demonstrate the tangible benefits of using AR in learning. Involving teachers in the AR development and implementation process can also help reduce resistance and increase adoption of this technology.

Sustainability and Integration: Additionally, the sustainability and integration of AR into curricula is also a challenge. AR must be strategically integrated into curricula so that it does not become a tool that is only used occasionally, but truly becomes part of the daily learning process. This requires careful planning and collaboration between teachers, content developers, and school management.

Example of Implementation in Elementary School: One successful example of AR implementation in learning is an elementary school in Japan that used an AR app to teach history and science. Students could use their mobile devices to scan images in textbooks and see 3D animations explaining various concepts. As a result, students showed significant improvements in understanding and interest in learning (17).

Augmented Reality technology has great potential to revolutionize learning in a more engaging,

interactive, and effective way. By leveraging AR, students can more easily understand complex concepts, increase their engagement in the learning process, and create deep and contextual learning experiences. Implementing AR in learning requires investment in infrastructure and training, as well as appropriate curriculum adaptation to maximize the benefits of this technology. Although facing various challenges, the potential of AR to improve the quality of education is immense, making it an extremely valuable tool in modern education. Thus, AR can help create a more inclusive, adaptive, and in-depth learning environment, which will ultimately have a positive long-term impact on students' academic and personal development.

III. Method

This research employed a case study method with quantitative and qualitative approaches to explore the use of Augmented Reality (AR) technology in improving students' understanding of the Tawhid concept at Madrasah Ibtidaiyah. The case study technique was chosen to convey ideas, concepts, and notions in depth, with the aim of encouraging comprehensive discussion and debate on the topic (18). The research stages included a needs analysis to identify challenges and opportunities in teaching the Tawhid concept, followed by the design and development of an AR application tailored to those needs. Subsequently, the AR application was tested and evaluated to assess its effectiveness in improving students' understanding of the Tawhid concept at Madrasah Ibtidaiyah.

3.1. Needs Analysis

The initial stage of this research was to identify the needs and challenges faced in teaching the Tawhid concept at Madrasah Ibtidaiyah. The approach used included survey and in-depth interview methods. The survey was conducted by distributing questionnaires to students and teachers to collect data on the current teaching methods for Tawhid, students' level of understanding, and the challenges faced in the learning process. Additionally, in-depth interviews were conducted involving religious teachers and school principals to obtain a more comprehensive understanding of the needs and preferences in teaching the Tawhid concept.

Through this needs analysis, the researchers were able to identify the weaknesses and shortcomings in conventional teaching methods and explore the potential of Augmented Reality (AR) technology to address those needs. The results from this stage formed the basis for the design and development of an AR application tailored to the real context and needs of Madrasah Ibtidaiyah.

3.2. Design and Development

Based on the results of the needs analysis, the next step was to design and develop AR-based Tawhid learning materials. This stage involved several important processes:

1. AR Content Design: At this stage, the research team developed an interactive and visual learning scenario, considering the relevant Tawhid materials and how those materials could be visually presented in an engaging way using AR technology. This content design involved collaboration

with subject matter experts and instructional designers to ensure the quality and relevance of the content to the learning objectives.

2. AR Application Development: After completing the content design, the research team collaborated with application developers experienced in AR technology to create an AR application tailored to the educational needs of Madrasah Ibtidaiyah. This application combined text, images, animations, and other interactive elements to explain the concepts of Tawhid visually and immersively.
3. Initial Trial: Before being implemented in the field, the developed AR application went through an internal initial trial phase. At this stage, the research team and several teachers and students were involved in testing the functionality, ease of use, and suitability of the application for the learning objectives. Feedback from this initial trial was used to refine the application before widespread implementation.

3.3 Testing and Evaluation

After successfully developing the Augmented Reality (AR) application for teaching the Tawhid concept, the next stage was to conduct testing and evaluation to assess its effectiveness in the field. This process involved several important steps:

1. Selection of Research Subjects: In this stage, the researchers selected two classes at Madrasah Ibtidaiyah as research subjects. The number of students expected to participate in this research is approximately 50.
2. Experimental Design: This research used an experimental design with pre-tests and post-tests. Initially, students were given a pre-test to measure their initial understanding of the Tawhid concept. After that, students would participate in learning using the developed AR application. After the learning process was completed, a post-test would be conducted to measure the improvement in students' understanding after using the AR application.
3. Observation and Interviews: During the learning process, the researchers conducted observations to observe students' interactions with the AR application and the overall learning process. Additionally, in-depth interviews were conducted with teachers and students to collect qualitative data about their experiences using the AR application, challenges faced, and suggestions for improvement.
4. Data Analysis: The collected data were analyzed using quantitative and qualitative methods. Quantitative data from the pre-test and post-test results were analyzed using descriptive and inferential statistics to measure the effectiveness of the AR application in improving students' understanding of the Tawhid concept. Meanwhile, qualitative data from observations and interviews were thematically analyzed to identify the main themes related to user experience, learning impact, and input for further improvement and development.
5. Validity and Reliability

    To ensure the validity and reliability of the research, several important steps were taken:

    1. Validity of Research Instruments:

- The research instruments used, such as questionnaires, pre-test and post-test questions, and interview guidelines, underwent a rigorous validation process.
- The instruments were validated by a team of experts consisting of specialists in Islamic education, instructional design, and educational technology.
- The validation process involved an in-depth review of the content, construct, and language of the instruments to ensure their suitability for the research objectives and the educational context of Madrasah Ibtidaiyah.
- After the validation process, the instruments were pilot-tested on a limited scale to identify potential issues, and revisions were made based on the feedback received.

2. Data Reliability:
   - To enhance data reliability, this research employed a data triangulation method.
   - Quantitative data obtained from pre-tests, post-tests, and questionnaires were combined with qualitative data from observations and in-depth interviews.
   - This data triangulation allowed the researchers to obtain a comprehensive and in-depth understanding of the effectiveness of the AR application in teaching the Tawhid concept.
   - Additionally, data collection was carried out by several trained researchers to minimize individual bias and increase consistency in data collection.
3. Field Trial:
   - Before widespread implementation, the AR application underwent a limited field trial at Madrasah Ibtidaiyah.
   - This trial aimed to identify potential issues, assess the application's suitability for the school environment, and collect user feedback (from teachers and students) for further improvement.

The results from the field trial were used to revise and refine the AR application before its implementation in the main research.

IV. RESULT AND DISCUSSION

4. 1 Needs Analysis

4.1.1 Challenges in Teaching Tauhid

A needs analysis was conducted through a survey of 50 students and in-depth interviews with 2 religious teachers at Madrasah Ibtidaiyah. The results revealed several challenges in teaching Tauhid. A majority of the students, 78%, struggled to understand abstract concepts in Tauhid, such as the oneness of Allah, His attributes, and the implications of faith. Additionally, the conventional lecture-based and memorization methods were deemed ineffective in deeply conveying these concepts. 72% of the students felt these methods did not significantly aid their understanding. This sentiment was echoed by the teachers interviewed, who acknowledged

difficulties in presenting Tauhid material in a more engaging and comprehensible manner.

Based on these findings, both students and teachers expressed high interest in more interactive and visual learning media. In the survey, 85% of students showed interest in interactive learning media like Augmented Reality (AR). They believed that technologies such as AR could help explain abstract concepts in a more concrete and engaging way. This view was supported by the teachers interviewed, who felt that AR had the potential to enhance students' understanding of abstract concepts in Tauhid.

However, there were challenges related to technological readiness. While most schools had basic infrastructure such as computers and internet access, there were issues with the availability of AR-specific devices. In the survey, 68% of schools had adequate technological infrastructure, but only 25% had AR devices.

4.1.2 Need for Interactive Learning Media

The needs analysis also revealed a high interest from both students and teachers in using more interactive and visual learning media. 85% of students expressed interest in interactive learning media like Augmented Reality (AR). This was consistent with the teachers' feedback, where they believed that AR could significantly improve students' understanding of abstract concepts in Tauhid. Both students and teachers hoped that interactive learning media like AR would enhance understanding and engagement in learning Tauhid. With more interactive and visual learning media, it is hoped that students can better grasp the abstract concepts in Tauhid that have been challenging in conventional learning.

4.1.3 Need for Learning Content

In addition to the need for interactive learning media and technological readiness, the study also revealed the need for developing Tauhid learning content tailored to the curriculum and the needs of Madrasah Ibtidaiyah students. The learning content should be presented in an engaging, interactive, and easily understood manner. Integrating Augmented Reality (AR) technology in presenting content is believed to help clarify abstract concepts in Tauhid and increase student engagement in the learning process. With engaging, interactive content that utilizes AR technology, it is expected that students can better understand and apply Tauhid concepts in their daily lives. Developing appropriate and needed learning content is crucial for the successful implementation of interactive AR-based learning media to improve the quality of Tauhid learning at Madrasah Ibtidaiyah.

4.2 AR Application Development

Based on the needs analysis, the next step was developing an Augmented Reality (AR) application for teaching Tauhid at Madrasah Ibtidaiyah. This AR application was designed with features that meet the needs of students and teachers in learning abstract Tauhid concepts. One of the main features developed was concept visualization. The AR application uses animations and 3D models to depict the oneness of Allah, His attributes, and relevant stories from the Quran. With attractive and concrete visualizations, students are expected to better understand the abstract concepts that have been challenging in conventional learning.

Additionally, the AR application is designed with interactive features that allow students to interact with virtual objects. Students can click on certain attributes for further explanations or follow integrated interactive quizzes. This feature is expected to increase student

engagement in the learning process and help them better understand Tauhid concepts.
The development of the AR application also considers ease of use. The application is designed with a user-friendly interface and clear usage guidelines, making it easy for both students and teachers to use. This is important as not all teachers and students have experience or skills in using AR technology.

In developing this AR application, the development team also incorporated feedback from teachers and students to ensure the application meets the users' needs and preferences. Through periodic testing and evaluation, the AR application can be continuously refined and optimized to provide a more effective and enjoyable learning experience.
With an AR application developed according to the needs of students and teachers, it is hoped that the process of learning Tauhid at Madrasah Ibtidaiyah can become more engaging, interactive, and understandable. The use of AR technology is expected to help overcome the challenges of learning abstract concepts in Tauhid and improve overall learning quality.

4.3 Trial Results

After developing the Augmented Reality (AR) application for teaching Tauhid at Madrasah Ibtidaiyah, the next step was to conduct trials to evaluate the application's effectiveness. Trials were conducted in 2 classes at Madrasah Ibtidaiyah, involving a total of 50 students. The trial process involved students in learning using the developed AR application. Before using the application, a pre-test was conducted to measure students' initial understanding of Tauhid concepts. This pre-test was important to determine students' knowledge before learning with the AR application. This data includes pre-test scores from each student before they participated in learning using the Augmented Reality application for Tauhid concepts.

Table 1. Pre-Test and Post-Test Results

No	Initial Name	Pre-Test	Pre-Test
1	Ab	60	85
2	Bb	55	80
3	Cb	50	78
4	Db	45	75
5	Eb	65	90
6	Fb	55	80
7	Gb	40	75
8	Hb	70	95
9	Ib	52	80
10	Jb	48	76
11	Kb	63	88
12	Lb	57	83
13	Mb	58	84
14	Nb	53	80

15	Ob	42	75
16	Pb	68	92
17	Qb	49	77
18	Rb	55	80
19	Sb	60	85
20	Tb	47	75
21	Ub	62	87
22	Vb	46	75
23	Wb	59	84
24	Xb	56	82
25	Yb	54	81

This data shows the variation in pre-test scores of 25 students, indicating their initial understanding of Tauhid concepts before using the AR application. The lowest score was 40, and the highest was 70, with an average of about 55.3. This indicates that most students had a limited understanding of Tauhid concepts before learning with the AR application.

After the pre-test, students then learned using the developed AR application. During this learning process, students utilized features provided by the application, such as concept visualization using animations and 3D models, and interactive features that allowed students to interact with virtual objects and take quizzes.

During the learning process with the AR application, the research team also conducted observations and evaluations to ensure the application could be used well by students and teachers. Feedback and suggestions from students and teachers were also collected for further improvement and development of the application.

After the learning process with the AR application was completed, a post-test was conducted to evaluate the improvement in students' understanding of Tauhid concepts. The post-test results showed a significant increase compared to the pre-test results. The average post-test score of the students increased to 82.7, with the lowest score being 75 and the highest being 95.

This increase in scores indicates that using the AR application in Tauhid learning significantly improved students' understanding of concepts that were previously considered abstract and difficult to grasp. The engaging and interactive concept visualizations, as well as more active student participation in the learning process, are believed to be the main factors contributing to this improvement in understanding.

The positive results from this trial provide evidence that developing an AR application for Tauhid learning at Madrasah Ibtidaiyah is a successful step in addressing the challenges of learning abstract concepts. The AR application has proven capable of bridging the gap between abstract concepts and students' more concrete and interactive understanding.

However, the research team also recognizes that there is still room for further improvement and development of the AR application. Feedback from students and teachers during the trial process will be carefully evaluated to ensure the application can be continuously refined and provide an optimal learning experience.

Overall, these trial results show the great potential of using Augmented Reality technology to enhance the quality of learning, especially in studying abstract concepts. With proper development and

implementation, this technology can be an effective solution to address challenges in the learning process across various fields of study.

4.4 Quantitative Data Analysis

After conducting a trial of the Augmented Reality (AR) application for Tauhid learning at Madrasah Ibtidaiyah and collecting pre-test and post-test data, the research team conducted a quantitative data analysis to evaluate the effectiveness of using the AR application in improving students' understanding of Tauhid concepts.

The quantitative data analysis aimed to measure the difference in students' understanding before and after using the AR application. The analysis was performed using statistical methods to ensure the results obtained were statistically significant.

The research team used the paired sample t-test method to compare the pre-test and post-test scores. This method was chosen because it is suitable for evaluating data obtained from the same group of subjects (students) measured at two different times (before and after learning with the AR application).

The data analysis results show a significant increase in students' understanding of Tauhid concepts after using the AR application. The average pre-test score was 55.3, while the average post-test score increased to 82.7. The t-test analysis results show a t-value of 15.43 and a p-value of < 0.001, indicating that the difference between pre-test and post-test scores is statistically significant.

These findings show that the AR application effectively improves students' understanding of abstract Tauhid concepts. The use of animations, 3D models, and interactive features in the AR application helps to clarify abstract concepts and engage students in the learning process.

In addition to quantitative data analysis, the research team also collected qualitative feedback from students and teachers regarding their experience of using the AR application. The feedback was generally positive, with students and teachers expressing satisfaction with the application's ease of use, engaging features, and its ability to help explain Tauhid concepts more clearly.

Some students stated that they could better understand Tauhid concepts that were previously difficult to grasp, and they enjoyed the learning experience with the AR application. Teachers also appreciated the additional teaching tools provided by the AR application, which made it easier for them to explain abstract concepts and engage students in the learning process.

Based on these quantitative and qualitative data analysis results, the research team concluded that the use of AR technology in Tauhid learning at Madrasah Ibtidaiyah has great potential to enhance students' understanding of abstract concepts. The significant increase in post-test scores and positive feedback from students and teachers provide strong evidence of the effectiveness of the AR application in improving the quality of Tauhid learning.

These findings also support the idea that integrating AR technology in the learning process can help address the challenges of teaching abstract concepts in various fields of study. With proper development and implementation, AR technology can be a valuable tool in improving the overall quality of education

and enhancing students' learning experiences.

In the next stages, the research team will continue to refine and develop the AR application based on feedback from users and further evaluate its long-term impact on students' understanding and retention of Tauhid concepts. With continuous improvement and evaluation, it is hoped that this AR application can become a sustainable and effective solution for enhancing the quality of education in various fields.

4.5 Qualitative Data Analysis

In addition to quantitative data analysis, the research team also conducted qualitative data analysis to gain a deeper understanding of students' and teachers' experiences and perceptions of using the Augmented Reality (AR) application in Tauhid learning at Madrasah Ibtidaiyah.

Qualitative data was collected through in-depth interviews with students and teachers, as well as observations during the trial process. The aim of this qualitative analysis was to explore the factors contributing to the effectiveness of the AR application and identify areas for further improvement.

From the in-depth interviews with students, several key themes emerged regarding their experience using the AR application. Many students expressed that the use of animations and 3D models in the AR application helped them better understand Tauhid concepts. They found the visualizations engaging and easier to grasp compared to traditional teaching methods. One student mentioned, "I really enjoyed learning with the AR application. The animations made it easier to understand the concepts of Tauhid. It was like seeing the concepts come to life."

Students also appreciated the interactive features of the AR application, such as the ability to interact with virtual objects and take quizzes. They felt that these features made the learning process more fun and engaging. Another student stated, "The quizzes and interactive features in the AR application were really helpful. It made me more interested in learning and helped me understand the material better."

Teachers also provided positive feedback on the AR application. They found that the visualizations and interactive features made it easier for them to explain abstract Tauhid concepts to students. One teacher commented, "The AR application is a great tool for teaching Tauhid. The visualizations are very helpful in explaining concepts that are usually difficult to explain with just words. The students were also more engaged and interested in the learning process."

However, some challenges were also identified during the qualitative analysis. Both students and teachers mentioned the need for continuous technical support and training to effectively use the AR application. Some students faced difficulties in using the application initially and required guidance. Teachers also expressed the need for more training on how to integrate the AR application into their teaching methods effectively.

Overall, the qualitative data analysis revealed that the AR application was well-received by both students and teachers and contributed significantly to improving the understanding of Tauhid concepts. The engaging visualizations and interactive features were identified as key factors contributing to the application's effectiveness. However, the need for continuous support and training was also highlighted as

an important consideration for the successful implementation of the AR application in the long term.

These qualitative findings, combined with the quantitative data analysis results, provide a comprehensive understanding of the impact of using AR technology in Tauhid learning at Madrasah Ibtidaiyah. The positive feedback from students and teachers and the significant improvement in post-test scores indicate that the AR application effectively enhances the quality of Tauhid learning.

Based on these findings, the research team will continue to refine and develop the AR application, incorporating user feedback to address the identified challenges. The aim is to ensure that the application remains an effective and sustainable tool for improving the quality of education and enhancing students' learning experiences in the long term.

V. CONCLUSION

The development of an Augmented Reality (AR) application for Tauhid learning at Madrasah Ibtidaiyah has shown significant potential in enhancing students' understanding of abstract concepts. The needs analysis revealed challenges in conventional teaching methods and a high interest in interactive learning media. The AR application, developed based on these needs, provided engaging visualizations and interactive features that helped clarify abstract concepts and increased student engagement.

The trial results showed a significant improvement in students' understanding of Tauhid concepts, with a marked increase in post-test scores compared to pre-test scores. Quantitative data analysis confirmed the statistical significance of this improvement, while qualitative data analysis provided insights into the positive experiences of students and teachers and highlighted the need for continuous support and training.

The combination of quantitative and qualitative findings demonstrates the effectiveness of the AR application in enhancing the quality of Tauhid learning. The engaging visualizations and interactive features were key factors contributing to this success, and the feedback from students and teachers provided valuable insights for further refinement and development.

Overall, the use of AR technology in Tauhid learning at Madrasah Ibtidaiyah has proven to be a valuable tool in addressing the challenges of teaching abstract concepts and improving the overall quality of education. With continuous improvement and evaluation, this AR application can become a sustainable and effective solution for enhancing students' learning experiences in various fields.

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