

Enhancing Learning Engagement in Madrasah Ibtidaiyah Students Through AR-Based Monopoly Media in History Education

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ARTICLE INFO

Keywords:

Learning media;
Augmented reality;
Interest in learning

Article history:

Received 2024-02-09
Revised 2024-03-28
Accepted 2024-06-28

ABSTRACT

Communication activities that occur between teachers and students in a class should provide positive feedback. However, sometimes a problem arises that makes communication activities ineffective. The lack of learning media innovation from teachers causes students to have a low interest in learning. This research aims to develop augmented reality-based monopoly game learning media as a breakthrough in increasing student learning interest. The research and development method used in this research is the ADDIE development model. The learning media used has been validated by media experts with a score of 85% and is on the criteria of being very feasible. In addition, the results of evaluation questionnaires from teachers who showed 96% lift and assessment results from students who showed scores of 38 out of a total of 40 scores on student evaluation questionnaires proved that learning media increased students' interest in learning. Through the development of learning media in this study, researchers hope that educators can be more innovative and creative in creating fun learning so that students also become more enthusiastic about teaching and learning activities in the classroom.

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1. INTRODUCTION

In education, teaching and learning activities in the classroom are communication activities between educators and students (Parlindungan et al., 2023). In communication activities, it is not uncommon for problems or deviations to arise and occur that cause communication to be ineffective and efficient. One of the efforts to overcome problems in learning communication activities is the use of integrated learning media (Asnawir &. In teaching and learning activities, the media becomes one element of the learning process that plays an important role in the results of teaching and learning activities (Hamalik, 2013). The use of learning media provides several benefits for students, including 1) providing a great feeling of curiosity and increasing student learning motivation, 2) helping students understand an abstract or complicated concept, 3) attracting attention, and so on (Wibowo et al., 2022).

The use of learning media as a means to help teachers is currently very necessary due to technological developments and changes in social conditions due to the COVID-19 pandemic. This changed learning activity process makes teachers need innovative strategies for carrying out fun and

inspiring learning activities (Liarni et al., 2021). In addition, one of the consequences of the COVID-19 pandemic yesterday is that students teachers, and prospective teachers are required to master technology that can support learning activities (Putri & Krismiyati, 2023). Mastery of technology for students and teachers is a challenge that needs to be improved and considered during the learning process (Siahaan, 2020). In addition, the use of strategies in carrying out learning in the classroom is required to overcome various problems faced so that learning objectives are well achieved (Halawa, 2020). Another impact of the COVID-19 pandemic is the difficulty students have in adjusting to direct learning because previously they had to carry out online or online learning (Muzdalifa, 2022). Unfortunately, when the face-to-face learning process is conducted, students often feel bored with learning that relies only on the lecture method (Safira & Batubara, 2021).

Judging from today's technological advances, all aspects of life cannot be separated from information and communication technology (ICT), especially in the field of education. Permendikbud Number 37 of 2018 Article 2A Paragraph 1 states that "Informatics content in Ibtidaiyah Elementary Schools/Madrasah (SD/MI) can be used as a learning tool and/or learned through extracurricular and/or local content." This paragraph shows that teachers at the Ibtidaiyah Elementary School / Madrasah (SD / MI) level must be able to master technology that can be used to support learning activities so that students can understand lessons and have knowledge about technological developments today (Huda, 2020). The development of science and technology urges the world of education to continue to improve the quality of learning through the development of innovative, interactive, and effective learning media (Utomo, 2023). Education and learning institutions must commit to developing information and communication technology directed at empowering all existing facilities (Syawaludin & Rintayati, 2018).

At this time, technology is not only introduced to adults but children have also been introduced to computer application technology even before they sit in school (Huang et al., 2023). One of the efforts to develop learning media that uses technology is Augmented Reality-based learning media (Juwita et al., 2021). Augmented Reality is a technology that combines three-dimensional (3D) virtual objects into three-dimensional (3D) real objects in the same time and place. This allows people to connect to virtual objects in real-time without reducing the distance between the two (Larasati & Widyasari, 2021). Through the design of Augmented Reality (AR)-based learning media, teachers can provide a fun learning experience so that students have a high interest in teaching and learning activities (Y. D. P. Kurniawan & Mubarok, 2022). One of the materials on the history of Islamic culture (SKI) at the Madrasah Ibtidaiyah level in grade 6 is about the history of the founders of Islam in Indonesia and their biographies. Students are required to memorize the names of the founding figures of Islam and the history of their journey in establishing Islam in Indonesia. To give students a solid foundation, they must study the history of Islamic culture in Indonesia so that they remember the names of the founding figures of Islam as well as the history of how Islam was founded in Indonesia (Mardhiyah et al., 2023).

By utilizing Augmented Reality (AR) technology, students can more easily understand and memorize the names of the founding figures of Islam and its history because learning takes place in fun so it gives a meaningful impression on students. If the use of learning media in the SKI learning process at Madrasah Ibtidaiyah is done correctly, there will be benefits obtained from the use of these media (Nasol & Haryono, 2023). These benefits include delivering learning messages that are easier to understand, clearer explanations of messages so that they are not too verbalistic, increasing students' enthusiasm for learning, and increasing student curiosity (Oktaviani et al., 2023). Thus, the quality of learning can be improved and learning objectives can be achieved properly (Farhurohman & Sa'adiyah, 2020).

The research (Yusa et al., 2023) revealed that the use of learning media based on augmented reality technology increases students' interest in learning. In addition, the research (Tiyasari & Sulisworo, 2021) also revealed that augmented reality-based learning media provide student satisfaction with the learning process that has been implemented. Augmented reality technology presents a virtual image where 3D objects can be displayed on a smartphone screen (Wibowo et al., 2022). The use of AR involves

all five senses of students so that participants become more focused on following learning in class. This is because AR has characteristics and functions similar to learning media, such as providing information from sender to receiver, providing explanations about delivery, and fostering interest and motivation in learning (Y. I. Kurniawan & Kusuma, 2021).

Based on initial observation interviews, the Sejarah Kebudayaan Islam (SKI) education at MIS NU Al-Ustmani Kajen Pekalongan typically employs a lecture method. This approach has led to student boredom during instructional activities. To address this issue, teachers at MIS NU Al-Ustmani have diversified their teaching methods by incorporating various learning media in certain sessions. Interviews indicate that engaging and imaginative learning media can notably enhance the learning interest of sixth-grade students at MIS NU Al-Ustmani Kajen Pekalongan. Motivated by these findings, researchers are inclined to develop innovative learning media for SKI courses at this institution, anticipating that such media will boost student engagement and achieve educational objectives. The integration of technology-based learning tools and compelling games has been found to significantly increase student enthusiasm, as they present a challenge through the gamification of learning content.

2. METHODS

The type of research used in this research is development or R&D (Research and Development), this method is a process to develop a new product or improve an old product until the product can be accounted for (Nitami et al., 2023). The research was carried out at MIS Al-Utsmani Kajen Pekalongan which has 12 classes with each class divided into classes A and B. The application of the use of Augmented Reality-based learning media was carried out in grade 6 MISNU Al-Utsmani Kajen Pekalongan involving 27 students. This sample selection uses purposive sampling techniques based on researchers' research through initial observations that show that students have low interest in learning the material provided. In this study, the development model used is the ADDIE development model. The ADDIE model provides an instructional system design with a system approach that divides the planning process of a product through several steps, arranges the steps in a logical sequence, and provides output at each step as input in the next step (Cahyadi, 2019). There are several stages in the ADDIE development model: Analyze, Design, Develop, implement, and Evaluate (Hidayat & Nizar, 2021). The stages of this research include:

2.1 Analysis

At this stage, researchers analyze interviews and initial observations to collect information as a basis for determining student problems and needs. Interviews and observations were conducted at MISNU Al-Utsmani Kajen Pekalongan together with teachers of Islamic cultural history class 6 B. In addition, researchers also explore interesting games that are suitable for use in technology-based learning media. Application sorting is also done to be adjusted to the game that has been chosen, this is done so that the application used is right with the learning objectives to be achieved.

2.2 Design

After analyzing the problems and needs of students, the next stage is to make a learning media design plan with the concept of an augmented reality-based monopoly game. At this stage, researchers design by determining the size of learning media, game rules, augmented reality applications used, tools and materials for making learning media, and compiling questions for monopoly cards. The application that will be used in creating augmented reality-based learning media is the Assemblr Studio application: Create 3D & AR. In this application, there are several features to create augmented reality and there are templates that make it easier for researchers to design learning media.

2.3 Development

In the development stage, learning media products are made according to the plan in the design stage, namely augmented reality-based historical monopoly learning media. The completed learning media is then validated by validators, namely media experts, through several criteria to determine its feasibility. The next step was to see student responses using product response questionnaires and involving one teacher of Islamic cultural history and 27 grade 6 B students of MISNU Al-Utsmani Kajen Pekalongan.

Validation at this stage is carried out by media experts selected according to their expertise. The data in this study is in the form of quantitative data and qualitative data. Quantitative data is obtained from questionnaire scores, while qualitative data is obtained from comments, suggestions for improvement, and conclusions of learning media products.

Table 1. Learning Media Feasibility Questionnaire Grid

No	Indicator	Percentage
1.	Media Aspect	30%
2.	Text Readability Aspect	20%
3.	Image Quality Aspect	15%
4.	Aspects of Media Use	20%
5.	Media Effectiveness Aspects	15%
	Sum	100%

After validation, the results of the questionnaire are summed and eligibility is determined through the following criteria:

Table 2. Learning Media Qualification Analysis Criteria

Range	Category
0%-20%	Very Unworthy
21%-40%	Not Worth It
41%-60%	Pretty Decent
61%-80%	Proper
81%-100%	Very Worth It

The determination of the validation score is carried out after the validation by the media expert concerned, from the results of the questionnaire that has been carried out, the calculation can be done with the formula:

$$\text{Validity} = (\text{number of scores obtained} \div \text{number of maximum scores}) \times 100\%$$

2.4 Implementation

The implementation stage is the stage of testing learning media products. The trial was carried out with teachers of Islamic cultural history lessons and 27 grade 6 B students of MISNU Al-Utsmani Kajen Pekalongan. At this stage, assessments from teachers and students are also carried out to provide assessments that will be used at the evaluation stage. Student response and teacher involvement in this COB test can determine the improvements that must be made for researchers at the evaluation stage.

2.5 Evaluation

The evaluation phase is the last stage of the ADDIE development model. This stage is carried out to determine the value of the results of trials using learning media. The data collection instrument

conducted in this study was the form of a questionnaire filled out by teachers of Islamic cultural history lessons and 27 grade 6 B students of MISNU Al-Utsmani Kajen Pekalongan.

Table 3. Learning Media Assessment Questionnaire Grid

No	Indicator	Percentage
1.	Media Aspect	27%
2.	Aspects of Media Use	20%
3.	Image Quality Aspect	27%
4.	Media Effectiveness Aspects	26%
Sum		100%

After an evaluation by the lesson teacher, the results of the questionnaire are summed up and then the feasibility is determined through the following criteria:

Table 4. Learning Media Qualification Assessment Criteria

Range	Category
0%-27%	Very Unworthy
27%-47%	Not Worth It
48%-67%	Pretty Decent
68%-87%	Proper
88%-100%	Very Worth It

Determination of assessment scores is carried out after the implementation of learning media trials in the classroom, from the results of the questionnaire that has been carried out, the calculation can be done with the formula:

$$\text{Validity} = (\text{number of scores obtained} \div \text{number of maximum scores}) \times 100\%$$

Assessment is also carried out by students using questionnaires in the form of 8 questions with 5 assessment criteria. The total number of question results is 40 with the assessment criteria, namely:

Values 1-10 = Less Feasible

Values 11-20 = Sufficient

Values 21-30 = Feasible

Grades 31-40 = Very Decent

The number of criteria results is used to determine the feasibility of learning media that have been tested.

3. FINDINGS AND DISCUSSION

Research and trials of learning media product development were carried out in grade 6 B MISNU Al-Utsmani Kajen Pekalongan. Through the ADDIE development model developed by Dick and Carry (1996), the development of learning media is carried out in 5 stages. These stages will be explained as follows:

3.1 Analysis

The analysis stage carried out in this study was used to determine the needs of learning media that are suitable for students in the Islamic cultural history lesson grade 6 MI. The analysis was carried out through observation and interviews with grade 6 B MISNU Al-Utsmani Kajen Pekalongan cultural lesson teachers. In the results of class observations conducted in class, researchers found that grade 6 B students of MISNU Al-Utsmani Kajen Pekalongan have active, competitive, and sportsmanlike

characteristics. Through these observations, researchers concluded that the learning media products to be developed are games to arouse students' enthusiasm.

Learning media in the form of games that are packaged by combining technology can make students more interested. The use of technology in the form of augmented reality also gives students curiosity so that they feel happy when learning takes place. If the student's feelings are happy, then the student has a high interest in learning so that the learning objectives can be achieved. Giving appreciation in the form of prizes also motivates students to better understand the lesson and win the game.

In addition to observation, researchers also carried out analysis through interviews with related teachers. From the interviews, researchers concluded that the learning media that are usually used by teachers in carrying out learning are in the form of books and blackboards. The use of less innovative learning media makes students bored and reduces the level of student interest in learning. Therefore, through this analysis stage, researchers provide solutions in the form of augmented reality-based historical monopoly game learning media for grade 6 B students of MISNU Al-Utsmani Kajen Pekalongan.

3.2 Design

After carrying out the needs analysis, the next stage is to design an augmented reality-based historical monopoly game learning media product. The stages of product design of augmented reality-based historical monopoly game learning media are as follows:

1) Monopoly Design

The Monopoly game design on this medium uses a board that is modified so that it can be folded. This monopoly consists of:

- Monopoly board
- 17 rules
- 18 stops
- 2 dice
- 3 pieces
- 18 markers of power, and
- 30 question cards

All these elements are made by relating them to the lessons that students are studying, namely the history and biography of Sunan Kalijaga.

2) Desain Augmented Reality

The use of augmented reality technology in this Monopoly game is found in stops and question cards. This is done so that students cannot guess or peek at the contents of the question card to avoid cheating in the game. The augmented reality on the stops is also covered by the original form, the purpose of which is that students do not get confused and do not slow down the game time. But this stop can be scanned and an animation will appear that matches the one in the original form. By making it that way, students become more challenged and feel happy when learning takes place.

3.3 Development

The learning media developed is an augmented reality-based historical monopoly game media. Monopoly boards and so on are made manually, while augmented reality is made with the Assemblr Studio application: Create 3D &AR. The following is an explanation of making an augmented reality-based monopoly:

3.3.1 Monopoly game media creation

a) *Monopoly board*

This monopoly board is made using a whiteboard that is modified so that the board can be folded.



Figure 1. Monopoly board

b) *Cube*

The dice used in this game are the same as dice in general.



Figure 2. Dadu monopoly

c) *Pawn*

In this game, the pieces are divided into 3 because the game will be made into groups. This piece was modified using a white cloth to look like a scholar. This is done to add to the appeal of the game and link it with the history of Islamic culture.



Figure 3. Monopoly pieces

d) *Markers of power*

The power markers in this game are similar to the hotels in the usual Monopoly games. The number of these power markers is 18 which means that each group gets 6 power markers and the group that first completes 6 stops can be declared the winner.



Figure 4. Power Markers

e) Question cards

In this monopoly game, there are 3 stops, namely the question tree, the guest bed, and the command mosque. Each piece that stops at the stop must be able to answer the question so that the student can master the stop. The question tree card is green, the command mosque card is red and the guess bed card is blue.



Figure 5. Question Card

3.3.2 Card creation and dismissal using augmented reality

The application used to create this augmented reality is Assemblr Studio: Create 3D & AR. This application can be downloaded via the Google Play store. Here's how to create augmented reality using the application:

- a. Open the Assemblr Studio application: Create 3D and select the menu box "Create Your Creation."*

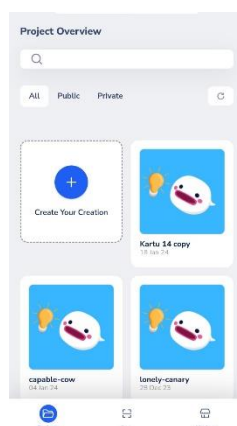


Figure 6. Assembly Studio application menu display: Create 3D&AR

- b. Select add "image" for images and "3D" for shapes.

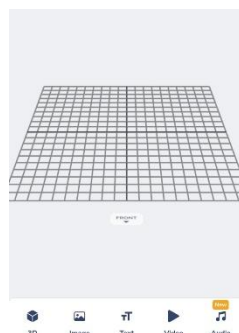


Figure 7. View of a place creating augmented reality.

- c. In this application we can choose to use images or 3D itself, but in the application has also prepared many choices of images or 3D that can be adjusted to your needs.

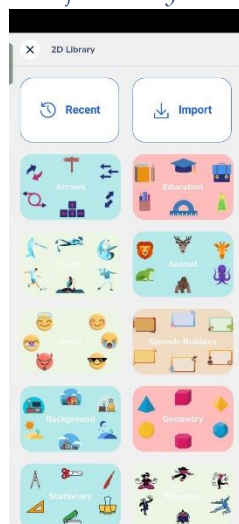


Figure 8. Display options for selecting images or 3D.

- d. After the image or 3D enters, we can adjust the size of the image or 3D as desired.



Figure 9. Selected image or 3D display.

- e. Click the top right button, then the display will change as below. Give titles, descriptions, and options as needed.



Figure 10. Image or 3D Download Process View.

- f. Check all options to share the image or 3D that has been created.

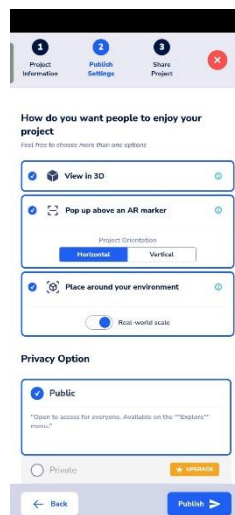


Figure 11. Display of the 3D image-sharing menu.

- g. This image or 3D can be shared in several ways according to the image below.

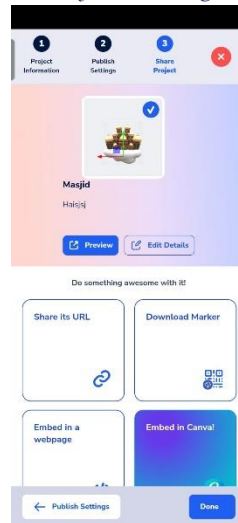


Figure 12. Display of the 3D image-sharing menu.

- h. Here's a ready-made or 3D image display shared via QR code.

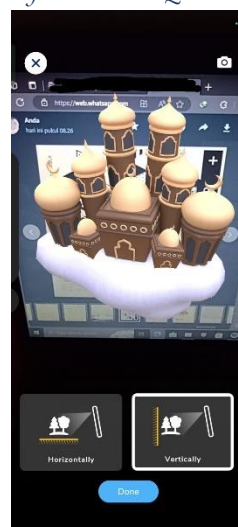


Figure 13. Display of the final image or 3D.

After the learning media product is completed, the next stage is validation by media experts. During the validation implementation, media experts fill out questionnaires and provide suggestions for improvements to researchers. The following are the results of validation conducted by media experts.

Table 5. Results of Validation by Media Experts

No	Indicator	Percentage
1.	Media Aspect	20%
2.	Text Readability Aspect	20%
3.	Image Quality Aspect	15%
4.	Aspects of Media Use	18%
5.	Media Effectiveness Aspects	12%
Sum		85%

The results of validation by media experts showed a percentage of 85%. Based on the criteria for analyzing the feasibility of learning media in Table 2, the augmented reality-based monopoly game learning media is declared VERY FEASIBLE. However, this learning media received suggestions for improvement, namely the appearance of images in AR is less clear.

From the results of this validation, it can be concluded that this augmented reality-based monopoly game learning media can be used and tested on students. With these conclusions, the implementation stage can be implemented.

3.4 Implementation

The trial of augmented reality-based Monopoly game learning media was conducted with the 6th grade B class at MISNU Al-Utsmani Kajen Pekalongan. The entire class participated as one large group. Throughout the trial, Islamic cultural history teachers monitored and assessed the augmented reality-based Monopoly game learning media. Teachers provided their evaluations during the game and upon its completion. The results from the teacher assessment questionnaires of the augmented reality-based Monopoly game learning media are as follows.

Table 6. Results of the Learning Media Evaluation Questionnaire

No	Indicator	Percentage
1.	Media Aspect	27%
2.	Aspects of Media Use	16%
3.	Image Quality Aspect	27%
4.	Media Effectiveness Aspects	26%
Sum		96%

The results of the teacher's assessment of augmented reality-based Monopoly game learning media showed a percentage of 96%. Based on the eligibility assessment criteria for learning media in Table 4. So, the augmented reality-based monopoly game learning media is declared VERY FEASIBLE, and suggestions for improvements in the form of application readiness are given when starting the game. In addition, questionnaires were also given in the form of questions to students regarding their satisfaction with the learning media of augmented reality-based monopoly games.

Table 7. Results of Learning Media Evaluation Questionnaire From Students

No	Indicator	Rating Scale				
		1	2	3	4	5
1.	Is monopoly learning media <i>Augmented Reality</i> easy to use?					
2.	Are the rules on <i>Augmented Reality</i> monopoly learning media easy to understand?					
3.	Are the stop and card functions on <i>Augmented Reality</i> monopoly learning media easy to understand?					
4.	The image displayed in <i>Augmented Reality</i> does not break					
5.	Images displayed in <i>Augmented Reality</i> can be seen					
6.	This <i>Augmented Reality monopoly media</i> is by the lessons learned					
7.	<i>Augmented Reality's monopoly media</i> is easy to store					
8.	Does the learning process become more interesting and fun?					
Sum				38		

The assessment results show a value of 38, so based on the media feasibility assessment criteria states that the augmented reality-based monopoly game learning media is FEASIBLE to use.

3.5 Evaluation

Based on the implementation stage, the augmented reality-based monopoly game learning media must be evaluated. In this evaluation stage, the final product is created based on student and teacher input and improvement suggestions provided during the implementation phase in the school. In this study, the evaluation stage has been carried out based on assessments and recommendations from expert validators, teachers, and students regarding the media that has been created. This assessment is used as a basis for the evaluation of augmented reality-based monopoly game learning media for continued development.

Discussion

The use of augmented reality technology in the world of education greatly helps teachers in innovating and creating in the implementation of learning in the classroom. Combining learning media with games makes students more excited during learning. Educators get a lot of convenience through the development of technology that can interact directly with students (Billinghurst & Duenser, 2012). In previous studies, the use of augmented reality technology provided satisfaction and increased students' interest in learning (Bacca et al., 2014). Meanwhile, the research that has been carried out combining augmented reality technology with monopoly play has a more interesting impact on students (Chen et al., 2017). The competitive attitude of students also makes the application of learning media more enjoyable so that the classroom atmosphere is conducive and students can get a deeper understanding of the material (Ibáñez et al., 2014).

Based on research that has been done, the results show that augmented reality-based learning media combined with monopoly games can increase student learning interest during learning. Through a game, students are invited to behave in a sportsmanlike and competitive manner so that their enthusiasm increases and the classroom atmosphere becomes fun (Huang et al., 2019). Combining games with technology also increases students' attractiveness with the learning media used; students become interested in learning media because of their curiosity about augmented reality technology (Wu et al., 2013). When compared to previous studies that only use technology as a learning medium, the attractiveness of students with learning media is slightly less because of participation that many people cannot do (Chang et al., 2014). In addition, the operation of augmented reality media in previous studies can only be done through laptops while in this study the operation of augmented reality can already use mobile phones (Yilmaz, 2016). Therefore, through this research, it is expected that further research will be able to develop or combine technology-based learning media with other materials according to the learning to be carried out. The development of game-based learning media and technology has only been developed in the subject of Islamic Cultural History so that further research is needed on other subjects so that educators can understand more about the development of technology-based learning media (Azuma, 1997).

4. CONCLUSION

Based on the results of research and development that has been done, researchers concluded that augmented reality-based monopoly game learning media provides an increase in student learning interest. Through the use of augmented reality technology, teachers can further innovate in carrying out learning in the classroom. In addition, by using augmented reality-based technology, students' knowledge about technological developments is increasing and is expected to have a positive influence on teachers and students. The use of interesting learning media is proven to have a positive impact on students' interest in learning. This augmented reality-based monopoly game learning media has been declared very feasible by media experts, lesson teachers, and students. This statement is based on the

results of questionnaires and assessments given to lecturers, media experts, subject teachers, and students on the learning media used. The positive response from students also proves that this reality-based Monopoly game learning media is very effective when used as an educational medium. With the discovery of the development of technology-based learning media and toys, it is hoped that teachers can look for more innovations in carrying out classroom learning so that students become at home and not bored during learning and learning goals are achieved. However, the use of this technology is not always easy, there are some difficulties in its application such as the difficulty of finding applications or web that are suitable for children's age. In addition, some elements on the app are sometimes locked because they are not free so teachers have to spend a little money to buy some locked elements to use. The application maker should provide a cheap partnership for educators to be able to access all elements in the application so that they can use the application as a learning medium in carrying out learning in the classroom. Therefore, in the future, teachers are expected to be able to look for and find innovations in technology in the world of education, one of which is by using this augmented reality technology. The implementation of learning in class will be more fun if students can be directly involved in a game combined with technology so that learning objectives are achieved and students' understanding of learning can be more meaningful.

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