Integration Of Augmented Reality And Citizen Project Approaches In Civic Education To Enhance Student Learning Motivation And Achievement

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Civic Education learning has so far been conventional, lecturers only use Civic Education books that have not been touched by technology and have not been touched by the latest approaches in teaching Civic Education, therefore it is necessary to provide a touch of AR technology to support student motivation and learning achievement, then a touch of a new approach based on citizen projects is given which is packaged well and holistically, then R & D research has been conducted in this study with the ADDIE model with the results being a mobile product of Civic Education textbooks that have been validated by material experts and media experts and learning design experts with an average score of 85% strongly agreeing that this M-BAP product be used as a supplement to Civic Education learning at educational universities in Semarang, this is because M-BAP is able to display augmented reality in each of its materials and attract student learning motivation, then the citizen project approach is also applied in Civic Education learning.

Keywords: Development; M-BAP; Augmented Reality; Learning Motivation; Learning Outcomes.

Introduction

In the current situation of the society 5.0 era, lecturers and other educators both in schools and universities are expected to have innovations in learning, one of the innovations is to make textbooks that are interesting and fun for students, the problem that arises in the PPKN study program is that there are no lecturers who have developed teaching materials or textbooks based on renewable technology such as augmented reality or virtual reality, Therefore, to increase the understanding of PPKN UPGRIS students towards mastery of civic education material, it is necessary to make a mobile-based textbook so that students can easily read and

understand the material of the civic education course, to make the appearance of the textbook more attractive, an added reality that appears in 3D or augmented reality is added, then in addition to the added reality, it is necessary to add an appropriate learning model, namely the Citizen Project, meaning that the Citizenship Education Textbook will contain examples related to renewable citizenship cases and provide solutions to overcome them. In the development of augmented reality-based textbooks that have been widely developed at the elementary to university levels, the usefulness of augmented reality-based textbooks in the world of education, it is clear that millennial textbooks based on augmented reality (AR) as a learning medium for procedural texts are very popular with students in understanding Indonesian material easily and interestingly [1], then in learning PPKn based on augmented reality is able to increase motivation and results students learn [2], then in science learning in elementary school based on augmented reality students are very amazed and able to improve children's critical thinking skills [3], then in the development of textbooks and augmented reality on the concept of the digestive system in high school it is shown that students are very enthusiastic and understand the concept of the digestive system holistically and their science literacy has increased [4]. Then in the use of an appropriate learning approach in using the mobile product of civic education textbooks, the citizen project learning model was chosen with the hope that in the textbook there will be a touch of projects that students can do related to various civic issues, for the application of the citizen project approach has been widely used in PKn learning, as evidenced by the application of the citizen project learning model is able to improve skills critical and creative thinking of students [5], then the application of the project citizen model is able to increase students' ecological intelligence [6], then by applying the project citizen model greatly improves the green skills of vocational school students [7]. In overcoming the problems of PPKN UPGRIS study program students in understanding civic education material by creating augmented reality-based textbooks that attract students, this has been linked to the LPPM UPGRIS research strategic plan related to the prototype of developing the professionalism of educators and education personnel in the digital era with a focus on improving the ability of lecturers to present learning in the classroom in an interesting and fun way with the help of learning media renewable energy that is adjusted to the development of the times and is able to increase student motivation and learning outcomes. From the problems and solutions offered, research on the development of an augmented reality-based mobile civic education textbook (M-BAP) with a citizen project model was proposed to improve student motivation and learning outcomes.

Literature Review

In developing the Mobile Citizenship Education Textbook (M-BAP) Based on Augmented Reality with the Citizen Project Model to Improve Student Motivation and Learning Outcomes, one of the development research approaches is to use the ADDIE model which goes through five stages, namely (1) Analyze, (2) Design, (3) Development, (4) Implementation, (5) Evaluation. The use of the ADDIE development model makes it easier for researchers to design test instruments and learning media [6], while for Augmented Reality-Based Problem Solving with the Citizen Project Model, it is hoped that students will be able to use augmented reality to foster learning motivation and understanding of material digitally with an interesting three-dimensional reality, then with the citizen project model

makes students able to design PKn materials independently and designing mobile media for PKn textbooks in an attractive way.

The integration of Augmented Reality (AR) in educational contexts has gained significant attention in recent years, particularly in enhancing student engagement and learning outcomes. This literature review examines key studies and theories relevant to the development of Mobile Buku Ajar Pendidikan Kewarganegaraan (M-BAP) based on AR and the Citizen Project model.

1. Augmented Reality in Education: Research by Hapsari and Wulandari (2020) highlights the feasibility of AR-based textbooks in improving students' understanding of procedural texts. Their findings demonstrate that AR can transform traditional learning materials into interactive experiences, thereby increasing student motivation and retention of information. Similarly, Nurholisa et al. (2022) explore the effectiveness of AR in teaching social phenomena, indicating that AR enhances students' engagement and comprehension of complex concepts.

2. Citizen Project Model: The Citizen Project model, as discussed by Astuti and Sahono (2022), emphasizes active student participation in real-world issues, fostering critical thinking and civic responsibility. This model aligns with the principles of experiential learning, where students learn through direct experience and reflection. Setyosari (2016) supports this notion, arguing that project-based learning approaches, such as the Citizen Project, facilitate deeper understanding and practical application of theoretical knowledge.

3. Impact of Technology on Learning Outcomes: The use of technology in education has been shown to positively affect learning outcomes. Setyawan and Fatirul (2019) found that integrating technology into science education significantly improved students' engagement and academic performance. This is echoed by Kautsar (2020), who emphasizes the importance of digital tools in enhancing citizenship education, suggesting that AR can provide immersive learning experiences that traditional methods lack.

4. Challenges in Implementing AR: Despite the potential benefits, the implementation of AR in education is not without challenges. Ridayani et al. (2021) identify issues such as technological limitations, lack of training for educators, and resistance to change as significant barriers to effective AR integration. Addressing these challenges is crucial for the successful adoption of AR tools in educational settings.

5. Pedagogical Frameworks for AR: The ADDIE model, a widely recognized instructional design framework, serves as a foundation for developing effective educational interventions. As highlighted by Sugiyono (2017), the ADDIE model's systematic approach—comprising Analysis, Design, Development, Implementation, and Evaluation—ensures that educational products are tailored to meet learners' needs. This model has been effectively utilized in various educational projects, including those involving AR technologies.

6. Future Directions: The literature suggests a need for further research into the long-term effects of AR on student learning and the exploration of collaborative learning opportunities within AR environments. Studies by Widodo et al. (2020) and Rahmawati et al. (2022) indicate

that ongoing research is essential to refine AR applications and enhance their pedagogical effectiveness.

In summary, the existing literature underscores the transformative potential of AR in education, particularly within citizenship education. By integrating the Citizen Project model with AR technology, the development of M-BAP aims to create an engaging and effective learning experience that addresses contemporary educational challenges. Future research should continue to explore innovative approaches to AR implementation, ensuring that educational practices evolve in line with technological advancements.

Methodology

This research method is research and development. Research and development (Research and Development) is a research method used to produce certain products such as designs, models, prototypes of learning media etc., and test the effectiveness of the product [19], The research model uses the ADDIE model development research design model. This model, as the name implies, consists of five main phases or stages, namely (A)nalysis, (D)esign, (D)evelopment, (I)mplementation, and (E)valuation. The five phases or stages in the ADDIE model need to be carried out systemically and systematically, for the first year in the analysis, design and development steps, while in the second year in the implementation and evaluation steps. The research procedure that adopts the 5 stages of development of the ADDIE Model is:

Analyze : Conducting a needs analysis in developing AR-based PKn Mobile textbooks

Design: Designing research instruments and starting to design PKn textbook Mobile products

Development: Validating AR-based PKn textbook Mobile products

Implementation: Conducting a limited trial to two public and private campuses in Semarang

Evaluation: Conducting evaluations based on the results of trials on public and private campuses.

This research is carried out according to the ADDIE development model with the first year to the stage of analysis, design and development so that a mobile product of PKn textbooks that has been validated and has been tested is limited, then the outputs are (1) Registering the mobile rights product of the AR-based PKn textbook.

Findings/Results

In this development research, it has developed a Mobile Augmented Reality-Based Civic Education Textbook (M-BAP) product with a Citizen Project Model to Improve Student Motivation and Learning Outcomes, using the ADDIE model which goes through five stages, namely (1) Analyze, (2) Design, (3) Development, (4) Implementation, (5) Evaluation. In carrying out the first step, namely **the analysis stage**, the analysis was carried out by interviewing lecturers of the PKn course at PGRI Semarang University and Slamet Riyadi University Solo which showed that the PKn textbook made by lecturers for internal circles only and there was no touch of technology in the production of this PKn teaching material, therefore it is necessary to innovate the civic education textbook that is able to attract students in the learning is adapted to the times, one of the technologies that is interesting and in

accordance with the PKn digital textbook uses augmented reality which is able to display the added reality in each material, so far the civic education textbook is only an ordinary textbook and a touch of the citizen project model that has been included in the PKn textbook at Slamet Riyadi University Solo, based on an interview with a PKn teaching lecturer in Solo shows that with the citizen project model making students more aware of the conditions of citizenship in Indonesia contextually, then there is no renewable technology based on augmented reality applied at PGRI University Semarang and Slamet Riyadi University in PKn courses and made mobile-based textbooks that can be accessed anytime and anywhere, the second step is **the design** stage, in designing a Mobile Citizenship Education Textbook (M-BAP) product based on Augmented Reality with the Citizen Project Model carried out jointly with PKn lecturers at PGRI University Semarang and the research team made a textbook design based on the KKNI and OBE curriculum, then each chapter was given a touch of augmented reality so that it was interesting with the reality of the addition, then associated with the citizen project to make students' understanding of PKn material more in-depth, then at the end of the material is given questions that hone students' knowledge of introductory materials on civic education, democracy and human rights, archipelago insights, national resilience, politics and national strategy, a total of five chapters are discussed in this PKn textbook, here is a sample of M-BAP (Mobile Citizenship Education Textbook) products associated with augmented reality and citizen project models.
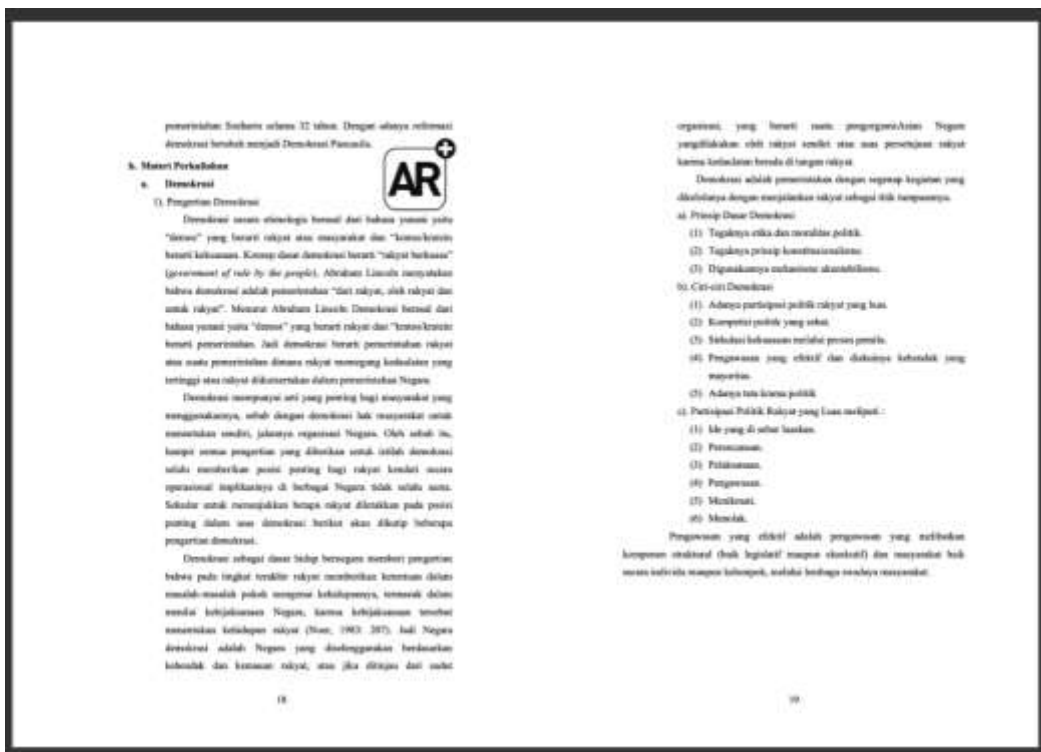

Figure 1. Implementation of AR in each chapter of PKn.

In each chapter, an AR barcode is given which must first be installed the AR PKn application in the student's smartphone or iphone, then students try to use this M-BAP application in trying the added reality of the AR marker in each chapter, with the added reality in the form of a video explanation of the PKn material making students can learn independently anytime and anywhere based on android or ios. Then in the application of the citizen project model, it is associated with the phenomenon of citizenship in Indonesia which is actual and factual.
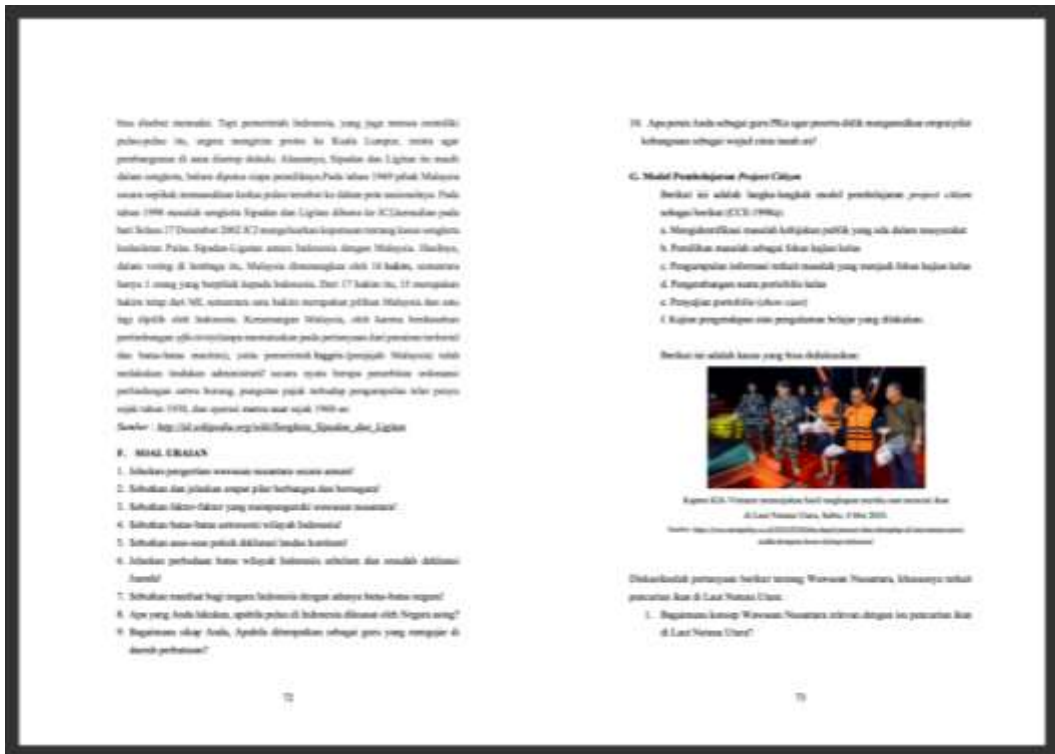

Figure 2. Application of citizen project in M-BAP-based PKn textbooks

The third step is **Development ,** in this step we have developed an augmented reality-based M-BAP (Mobile PKn Textbook) product combined with a citizen project model, after the M-BAP product is ready, then an FGD (Focus Group Discussion) is carried out to validate the M-BAP (Mobile PKn Textbook) product based on augmented reality. The FGD was carried out on a full-day basis by inviting PKn lecturers and reliable IT lecturers from PGRI University Semarang, UNTAG Semarang, Semarang University, Slamet Riyadi University Solo, from the results of the FGD showed that M-BAP products are suitable for use as a supplement to the teaching media of PKn lecturers at their respective universities with a slight revision, namely:

1. It is necessary to improve the sensitivity of the AR markers in each material, so that the video loading process in the AR markers is quickly detected and easy to play.
2. The added reality in this AR-based PKn textbook already represents the PKn material

in each chapter, but the duration of time needs to be added.

3. The novelty and product specifications need to be clarified in the preface description.
4. It is necessary to add PKn Study Materials in the discussion per Material.
5. The nomenclature of the CPn needs to be adjusted.
6. The operational pedagogical framework of Project Citizen has not yet been created by the Researcher.
7. It is necessary to create a Project Citizen-Based AR Guidebook both print and digital (external).
8. The draft of the textbook that has been designed has not been described in more detail the Syntax of Project Citizen supported by the Teaching Tool (RPS).
9. Digital technology for literacy needs to be strengthened again.
10. The R&D procedure in producing the M-BAP Product Specification is outlined in more detail.
11. It is hoped that it will be continued in the 2nd year until the output in the form of Paper Policy as an outcom of the MKWK Makul PKn policy.

Figure 3. Focus Group Discussion on the development of AR-based M-BAP products

After conducting an FGD related to the feasibility of this AR-based PKN textbook product associated with the citizen project approach, improvements will be made immediately and can be applied in 4 campuses in Central Java that have PPKn study programs, the following are the results of the validation response questionnaire from expert judgment:

1. PKN AR Book media with a citizen project approach displays a menu that is relevant in helping students understand PKN material
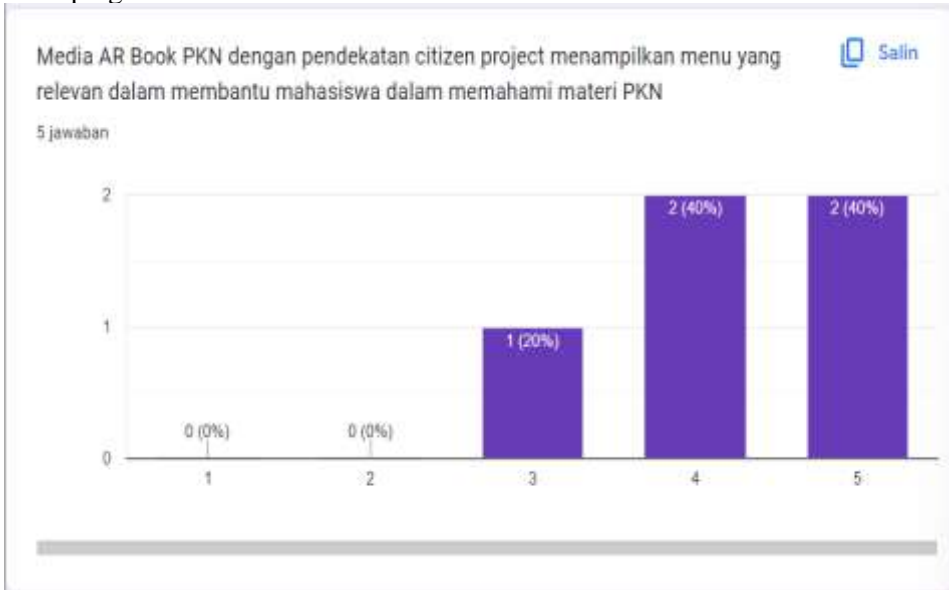
2. PKN AR Book media with a citizen project approach is easy to use in educating students about the importance of project-based citizenship education
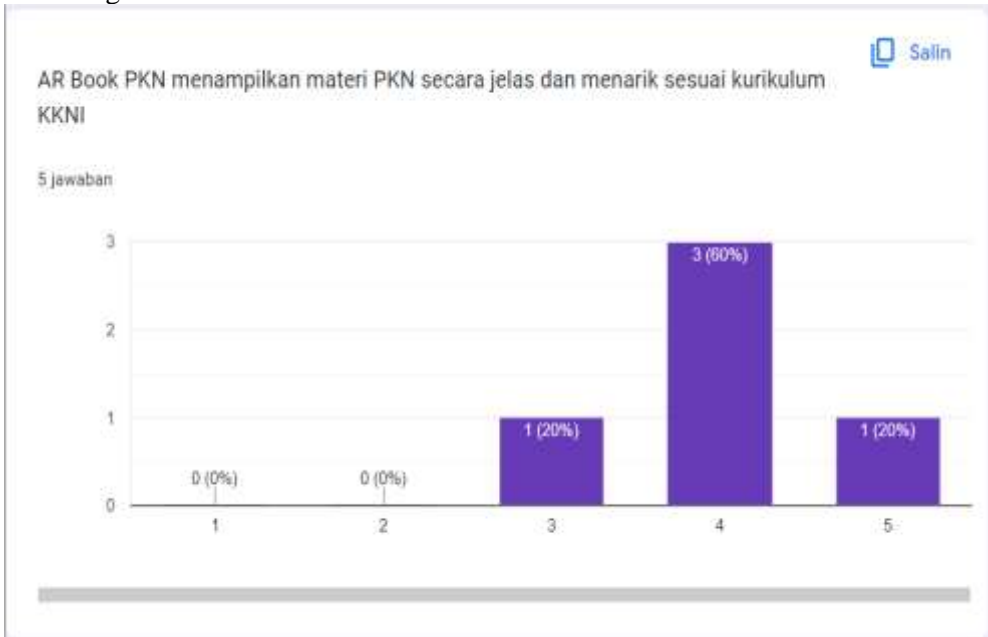
3. PKN AR Book media with a citizen project approach is easy to use in instilling material perception with AR
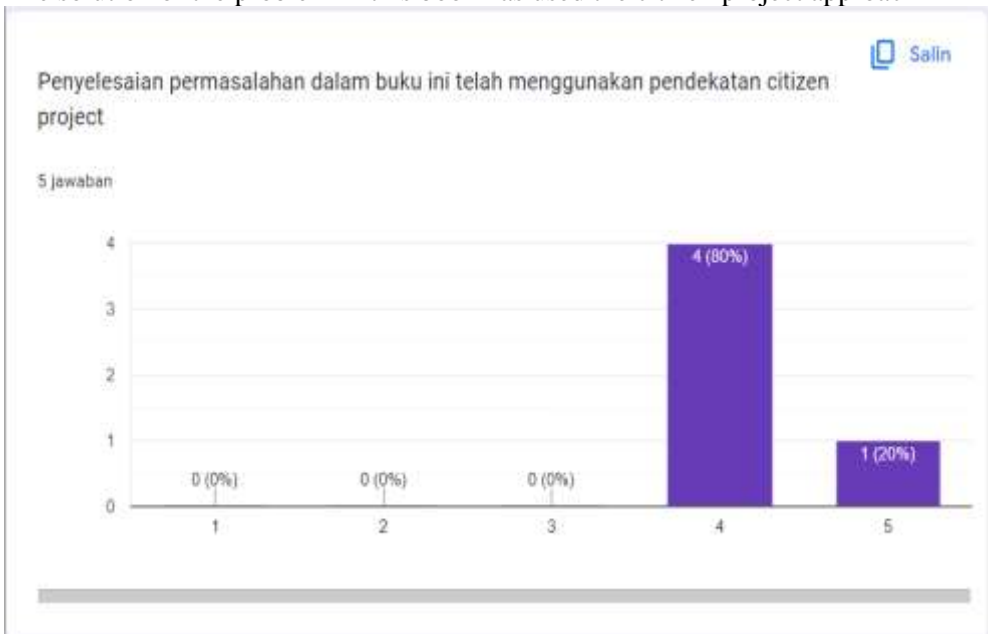

4. This PKN AR Book media is easy to use in writing down problems related to actual problems in society

5. The AR Book of PKN displays PKN material in a clear and interesting manner according to the KKNI curriculum

6. The solution of the problem in this book has used the citizen project approach
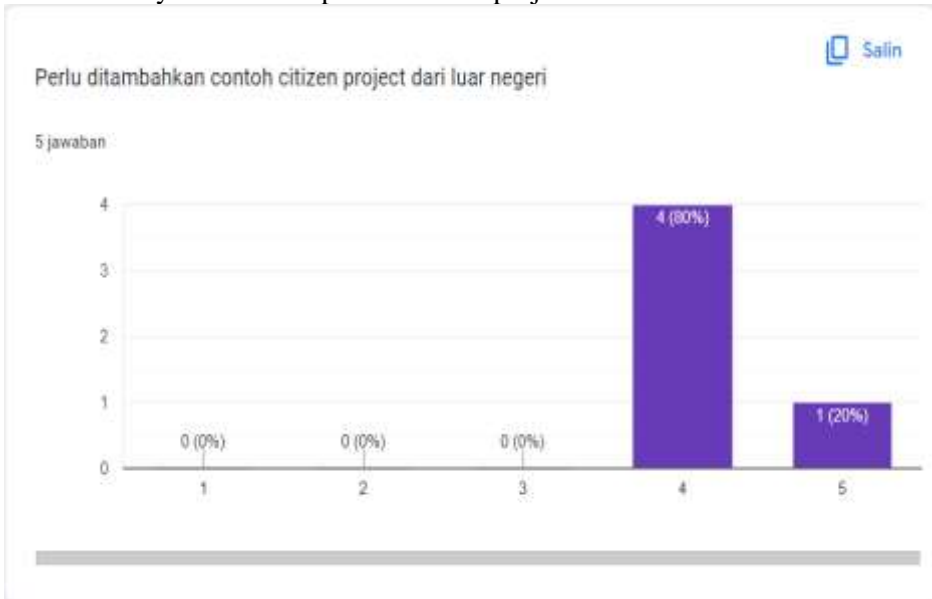
7. In this PKN AR Book media, students are more efficient in their time and energy in learning citizen projects in the community
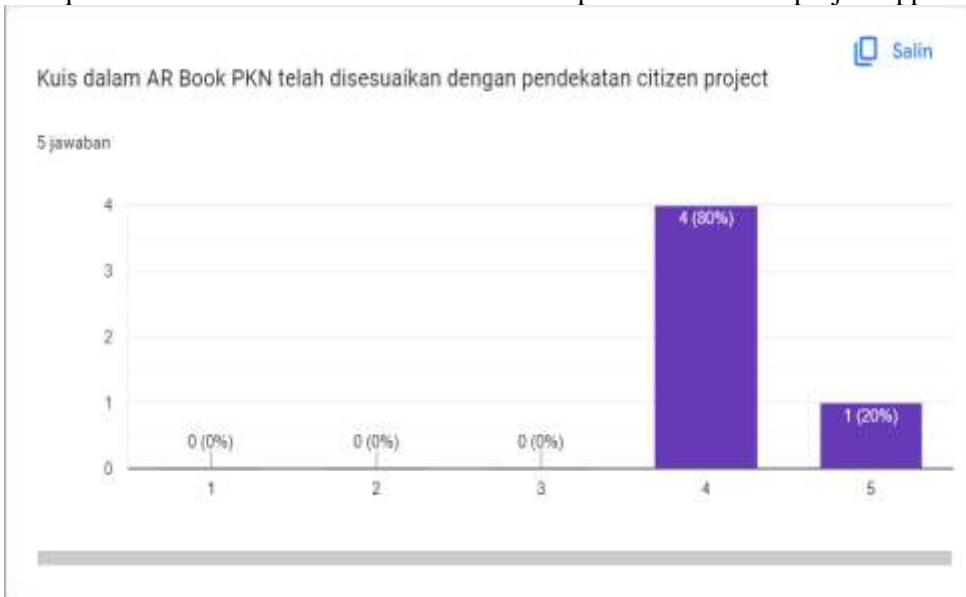

8. Problems in the world of education need to be updated in this book

9. It is necessary to add examples of citizen projects from abroad

10. The quizzes in the PKN AR Book have been adapted to the citizen project approach

The results of the expert validation show that more than 85% of them agree that this M-BAP product should be tested on a limited basis on campuses that have PKn courses in Central Java. The fourth step is **Implementation ,** at this stage of implementation an initial introduction has been carried out on the campus of the University of PGRI Semarang and now it has entered the second lecture, all students of this PKn course are required to install this AR-based M-

BAP product on all student smartphones, then students try to use the M-BAP product in understanding democracy and human rights and other materials holistically and continuously. The fifth step is **Evaluation**

We have not done a holistic evaluation yet, the plan is that after the third meeting there will be a test that includes students' understanding of the PKn material associated with augmented reality media and student understanding related to the citizen project material.

Discussion

In the next stage, a limited test of this M-BAP product will be carried out in the Pancasila and Citizenship education study program holistically until the end of the odd semester 2024-2025, in principle it has been applied 2 times at the beginning of the lecture meeting, and there are still many students whose smartphones do not support this M-BAP application, therefore it is necessary to upgrade the software so that all android and ios smartphones support this M-BAP application, Then students are still having difficulty using civic education textbooks because the textbooks are still not widely produced and the implementation of the citizen project is still not widely associated in each chapter, it is necessary to add the latest phenomena related to the condition of citizens in Indonesia today related to democracy, human rights and others.

In accordance with the steps of the ADDIE Model research model, the implementation and evaluation stages need to be carried out immediately so that the ADDIE development model stage is perfect with results that can be felt for all educators who teach PKN courses, the target for October 2024 is that students are proficient in using M-BAP products to supplement civics education textbooks in the classroom and outside the classroom.

Conclusion

In conclusion, the research on the development of the Mobile Buku Ajar Pendidikan Kewarganegaraan (M-BAP) based on Augmented Reality (AR) and the Citizen Project model has demonstrated significant strides in enhancing student motivation and learning outcomes in the field of citizenship education. Through the systematic application of the ADDIE model, the project has effectively addressed existing gaps in traditional teaching methods by integrating innovative technology that aligns with contemporary educational needs.

The findings indicate that the implementation of AR in educational materials not only enriches the learning experience but also fosters independent learning among students. The feedback received from focus group discussions validates the product's relevance and usability, further emphasizing its potential as a supplementary teaching tool in various educational institutions.

Moreover, the collaboration with partners and experts in the field has strengthened the development process, ensuring that the product meets the necessary educational standards and expectations. However, challenges remain, particularly in ensuring compatibility across diverse technological platforms and enhancing the content to reflect current socio-political contexts.

Looking ahead, the continuation of this research is essential. Future studies should focus on refining the AR features, expanding the content to include more contemporary issues, and evaluating the long-term impact of M-BAP on student learning outcomes. This project not

only contributes to the academic field but also serves as a model for integrating technology into education, paving the way for innovative approaches in teaching citizenship education.

Recommendations

Based on the findings and experiences from the development and implementation of the Mobile Buku Ajar Pendidikan Kewarganegaraan (M-BAP) based on Augmented Reality (AR) and the Citizen Project model, the following recommendations are proposed for future researchers and practitioners:

1. Enhance Technological Compatibility: Future researchers should focus on ensuring that the M-BAP application is compatible with a wider range of devices and operating systems. Conducting usability tests across various smartphones and tablets will help identify and resolve compatibility issues, thereby increasing accessibility for all students.

2. Continuous Content Development: It is essential to regularly update the content of the M-BAP to reflect current events and socio-political issues relevant to citizenship education. Collaborating with educators and experts in the field can help maintain the material's relevance and engagement.

3. Expand Training for Educators: Practitioners should consider implementing comprehensive training programs for educators on how to effectively use AR technologies in teaching. This will empower teachers to integrate the M-BAP into their curricula more efficiently and creatively.

4. Conduct Longitudinal Studies: Future research should include longitudinal studies to assess the long-term impact of AR-based learning tools on student engagement and academic performance. This will provide deeper insights into the effectiveness of such educational innovations over time.

5. Incorporate Feedback Mechanisms: Establishing structured feedback mechanisms for students using the M-BAP will allow for continuous improvement of the application. Gathering insights from users can guide future enhancements and ensure that the tool meets the educational needs of students.

6. Explore Collaborative Learning Opportunities: Encourage collaborative projects among students using the Citizen Project model, which can foster teamwork and critical thinking. This approach can enhance the learning experience and deepen understanding of citizenship concepts.

7. Investigate Funding Opportunities: Researchers and practitioners should explore funding opportunities to support the development and scaling of AR educational tools. Financial backing can facilitate further research, content creation, and technology upgrades.

By addressing these recommendations, future researchers and practitioners can enhance the effectiveness of AR-based educational tools and contribute to the advancement of citizenship education.

Limitations

In this fundamental research, the most difficult thing is to make an augmented reality product because it has to display the added reality in each material and the limited assets that support the PKn material, because systematic steps are needed so that examples of factual events are made with AR and expressed with the project ciitzen approach, this is a challenge that must be done so that the novelty in this research can be felt for the development of educational learning Citizenship.

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