Learning Model of Local Cultural Values Based on Augmented Reality for Social Science Education in Elementary School

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ABSTRACT

Integrating digital technology and local cultural values is needed in the learning process to instill feelings of tolerance and introduce diverse cultures to students. This research aims to analyze the steps of developing an augmented reality-based local cultural values learning model for social education learning in elementary schools. This development method is conducted through R&D adapted from Borg and Gall. This research collaborated with two teachers and ten students in the fifth-grade elementary schools in Lebak Regency, Banten. Data were collected through in-depth interviews, observations, and questionnaires. The results showed that local cultural values can be integrated with augmented reality technology to introduce cultural diversity to students in elementary schools. This research has implications for the character of elementary school students through the cultivation of local cultural values, namely caring for the environment, obeying the law, truthfulness, being able to collaborate, and understanding the concept of purity.

*Keywords***:**

Learning Model; Local Cultural Values; Educational Technology; Augmented Reality; Social Science.

ABSTRAK

Integrasi teknologi digital dan nilai-nilai kebudayaan lokal daerah dibutuhkan dalam proses pembelajaran sebagai cara untuk menanamkan

perasaan toleransi dan memperkenalkan beragam budaya kepada siswa. Penelitian ini bertujuan untuk menganalisis langkah-langkah pengembangan model pembelajaran nilai-nilai budaya local berbasis augmented reality untuk pembelajaran ilmu pendidikan social di sekolah dasar. Metode pengembangan ini dilakukan melalui R&D yang diadaptasi dari Borg dan Gall. Penelitian ini bekerjasama dengan dua guru dan 10 siswa di kelas lima Sekolah Dasar wilayah Kabupaten Lebak, Banten. Pengumpulan data dilakukan melalui wawancara mendalam, observasi dan penyebaran kuesioner. Hasil penelitian menunjukkan bahwa nilai-nilai budaya local dapat diintegrasikan dengan teknologi augmented reality untuk memperkenalkan keragaman budaya kepada siswa di sekolah dasar. Penelitian ini memiliki implikasi terhadap karakter siswa sekolah dasar melalui penanaman nilai-nilai budaya local yaitu perduli dan menghormati lingkungan, taat kepada hukum, memahami nilai kejujuran, dapat bekerjasama dan gotong royong, serta memahami konsep kesederhanaan dalam hidup.

*Kata kunci***:**

Model Pembelajaran; Nilai-Nilai Budaya Local; Teknologi Pendidikan; Augmented Reality; Ilmu Pengetahuan Sosial.

1. Introduction

Currently, the use of technology in education is a solution to face various challenges in the world of education. Various academics consider that the presence of technology makes learning activities more creative and productive(Nordlöf et al., 2024;Macgilchrist et al., 2020). Thus, the technology developed can encourage students to be more active in obtaining information and knowledge from various learning resources available. Educational technology is known for its characteristics that are relevant for educational purposes (Christopoulos & Sprangers, 2021). The presence of educational technology provides innovations for the dissemination of information widely, evenly, quickly, uniformly, and integrated(Lynch, Singal, & Francis, 2024). With the existence of educational technology, the material presented can complement and support the proposition of the subject matter(Hidayat & Firmanti, 2024). Therefore, educational technology can be used as a learning resource and help teachers realize a learning process that suits the needs of students(Doroudi, 2024). Elementary school students fall into the alpha generation category in the current digital era. Some studies show that the alpha generation is the generation born after 2010 (Taufiqqurrahman, Kuswandi, Setyosari, & Ulfa, 2023). The alpha generation is a generation that cannot be separated from technology(Hafizah, 2023). However, the rapid advancement of technology can affect the alpha generation regarding their learning style and daily socialization. Thus, the alpha generation can quickly understand knowledge and information through digital media. In addition, the presence of the alpha generation also goes hand in hand with the rapid development of practical and instant life patterns. Therefore, moral education for children is important. Moral education is inseparable from the process of fostering good moral behavior, such as instilling moral values in students so that they

can be implemented into social life(Zahrika & Andaryani, 2023). Some previous studies have shown that local wisdom-based moral education is an alternative way to preserve and maintain local wisdom for students(Shim, 2023; Komalasari & Apriani, 2021; Duryatmo et al., 2019). In addition, moral education based on local wisdom can also make it easier for teachers to introduce cultural diversity to students.

Since 2022, Indonesia, through the Ministry of Education, Culture, Research, and Technology, has changed from the 2013 curriculum to the Merdeka curriculum. The Merdeka Curriculum provides flexibility and makes it easier for educators to implement more in-depth learning according to the needs of students and focus on strengthening character(Gusteti & Neviyarni, 2022). Thus, local cultural values can be an alternative to local wisdom-based learning. The Merdeka Curriculum has the following principles: 1) focus on essential content, 2) character development, and 3) flexible(Purwati & Sukirman, 2024). Therefore, innovative learning that can also develop student character is needed. Based on the National Education System Law No. 20 of 2003, it explains that basic education in elementary schools and madrasah ibtidaiyah is the foundation of human civilization; its essence is emphasized on facts and reading facts in the performance of the objectivity of the universe. Therefore, this independent curriculum is the new one implemented to improve the quality of education and prepare students to face global challenges in the future (Damayanti, Pradana, Putri, & Laila, 2023). Preparing students to face the dynamics of globalization is not easy. Kurniawan et al. (2019) There are some setbacks in student behavior, such as bullying, interrupting conversations, and disrespecting elders in primary schools. In addition, awareness of environmental awareness is still not good because students are still seen littering (Purnami, 2021; Taufiq et al., 2014). Therefore, students need to be introduced to local cultural values to shape their character through social studies education.

To improve the quality of education, in the independent curriculum, the subjects of natural science and social science are combined(Mustafiyanti, Putri, Muyassaroh, Noviani, & Dylan, 2023). This is due to considering the psychology of elementary school-age children's development, which is focused on developing children's inquiry skills. In addition, integrating natural and social sciences aims to develop a more holistic, multidisciplinary, and contextualized education. Thus, the integration of the two subjects can strengthen multicultural education and develop a better understanding of various cultures, history, and social conditions in Indonesia and the world(Putri & Desyandri, 2023). Therefore, local cultural values can be an alternative learning resource. The use of current educational technology can also support local cultural values. One of the local cultures that can be used as a source of learning is the Baduy tribe. The Baduy tribe is one of the tribes in Indonesia that is unique in its uniform way of dressing, which is black, white, or dark blue. In addition, the Baduy tribe is also known for its people who walk barefoot (Nurmaulida, 2023). Besides, the Baduy community is a society that does not recognize changes like modern society. The Baduy tribe is also known for its lifestyle of simplicity, obedience, sincerity, and carrying out its customary traditions. Thus, the cultural values of the Baduy tribe can be an alternative learning model. The use of learning models through local cultural values has been done before, starting from integration into the character education curriculum (Lyesmaya et al., 2020; Wang, 2019). However, the use of local cultural values is only limited to the e-book module (Utari et al., 2024; Ayunin et al., 2023; Nasution et al., 2021).

Given the advancement of technology and improving students' skills in using technology, the learning model of local cultural values based on augmented reality is needed. Augmented reality is one of the technologies that is currently often used in education(Buchner & Kerres, 2023;Jang et al., 2019). This is because Augmented reality is a technology that combines two-dimensional virtual objects into a real environment and then projects these virtual objects into real-time(Koumpouros, 2024). In other words, augmented reality inserts certain information into the virtual world. It displays it in the real world with the help of equipment such as webcams, computers, android phones, and special glasses. Therefore, some previous research shows that augmented reality can be used as a learning media that is relevant to the current alpha generation(Koumpouros, 2024; López-Belmonte et al., 2023). The use of technology such as augmented reality can be an alternative for education in implementing an independent curriculum (Villagran-Vizcarra, Luviano-Cruz, Pérez-Domínguez, Méndez-González, & Garcia-Luna, 2023). Thus, integrating technology with local cultural values becomes a learning model supporting student character development.

The local values-based learning model is a suitable learning model to be implemented in primary schools. The learning model can also use technological support to facilitate the learning process. Although the local cultural values-based learning model has been implemented through e-books, its implementation still has obstacles (Hidayat & Firmanti, 2024). Thus, this learning model collaborates with inquiry-based learning by involving the potential of local cultural values in the learning process(Widodo et al., 2020). Thus, the learning model based on local cultural values can open opportunities for students in elementary schools to achieve learning objectives(Wastuti, Febrianto, & Hanik, 2021). Elan and Solihati (2022) assessed that the local wisdom of Baduy provides learning for students in primary schools to become good citizens because it contains values that can shape students' morality. However, the research has yet to integrate augmented reality technology. About the need for learning that follows the development of alpha generation technology and can strengthen students' character education through learning activities in elementary schools, this study aims to analyze the steps of developing a learning model of Baduy local cultural values based on augmented reality for social studies learning in elementary schools.

2. Methods

2.1. Research Design

In the process of this study, researchers only conducted four steps of the Borg and Gall development model as follows:
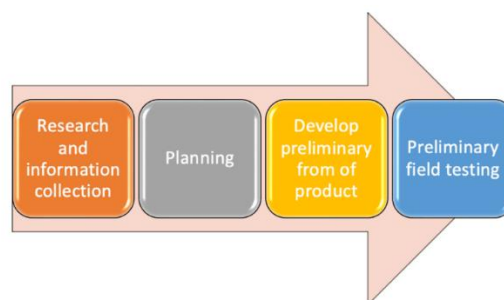
Figure 1. Product Development Model

Based on the purpose of this study, researchers used the development model adopted by Borg and Gall(2003) To develop augmented reality-based local cultural values. Borg and Gall conducted product development, namely: 1) research and information collection; 2) planning; 3) development preliminary of the product; 4) preliminary field testing; 5) main product revision; 6) main field testing; 7) operational product revision; 8) operational field testing; 9) final product revision; and 10) dissemination and implementation.

2.2 Participants

Baduy is one of the tribes in Indonesia. The Baduy village area is generally considered the prototype of the Sundanese community group village. Baduy itself is separated into two regions: inner Baduy and outer Baduy. Outer Baduy tends to accept outside culture more than the people in inner Baduy. The location of the Baduy tribe is in Lebak Regency, Banten. To instill Baduy's local culture's values, the researcher conducted research activities in elementary schools in Lebak Regency, Banten. This is because elementary school students in Lebak Regency can learn about their cultural diversity and local cultural values. Therefore, the researcher used purposive sampling to select participants in this study, including SD Negeri Rempoa 2, South Tangerang City, Banten. The participants of this study are two elementary school teachers with five to 10 years of teaching experience. The selected school is a public school that uses the independent curriculum as the learning curriculum. Meanwhile, ten elementary school students were selected according to research needs: fifth-grade students aged 11 to 12 years. The names of the participants in this study use codes to maintain the research ethics code, namely teachers (E1-E2) and students (EF1-EF10).

2.3 Data Collection

The data was collected through observation, in-depth interviews, and questionnaire distribution. Observation and in-depth interviews were conducted in the research and information collection stage. In the observation stage, researchers made direct observations in the classroom when the natural and social sciences learning process was carried out. Researchers observed learning activities by looking at student activeness and learning media used by teachers. After the lesson, the researcher asked two teachers for time to conduct interviews related to the needs of learning media on the material 'My region is my pride (*daerahku kebanggaanku).*' Researchers also identified students' learning characteristics through interviews with teachers and five students. As well as identifying the understanding of teachers and students related to augmented reality. The interview process was conducted for 60 to 90 minutes for each participant. Questionnaires were distributed to media and material experts to test the validity of the instruments and media that will be tested on participants.

2.4 Data Analysis

This research uses the feasibility percentage data analysis technique developed by Arikunto(2009). The percentage results used from the formula provide answers to the feasibility of

the aspects studied. The maximum expected value is 100%, while the minimum is 0%. The feasibility test categories are as follows:

Table 1. Feasibility Test Category

No	Percentage	Categories
1.	< 21%	Highly Unfeasible
2.	21% - 40%	Unfeasible
3.	41% - 60%	Feasible enough
4.	61% - 80%	Feasible
5.	81% - 100%	Highly feasible

3. Results and Discussion

Piaget in (Purwati & Sukirman, 2024) Explained that the development of cognitive abilities of elementary school students cannot yet understand abstract things well. Meanwhile, natural and social science education materials are full of abstract messages. One of the materials is 'My region is my pride.' Researchers conducted interviews to obtain in-depth information about students' understanding related to local culture in addition to the needs of the learning model.

"Generally, students only understand the region where their parents come from. But it has not yet reached the tribes. The learning model of local cultural values can be an alternative for transforming us into students. So that they can get to know the local culture in their province, such as the Baduy tribe."

"In developing the learning model of local cultural values, it is hoped that the materials, methods, and sources will also be arranged. So, teachers can easily direct students."

Fifth-grade teachers welcomed the learning model of the local cultural values of Baduy. However, it requires objectives, materials, methods, assessments, and learning resources that make it easy for teachers to integrate with students. Of the ten students, generally, they have never used augmented reality. So, they seemed eager to try the tool. Likewise, the class teacher has also never used the learning media. Because, usually, teachers only display animated videos and PowerPoint as learning media or games related to learning materials. So, from the results of the initial data collection, teachers have difficulty applying and practicing approaches and learning strategies and methods related to culture. Based on the information compiled, an augmented reality-based local cultural values learning model is important to develop with an easy-to-use design. Researchers conducted an augmented reality-based design in the design stage based on the information collected. However, before doing the augmented reality design, the researcher compiled the learning model of the local cultural values of Baduy as follows.

Table 2. Baduy Local Values Learning Model

No	Values	Material	Assessment
1	Care and Respect for the Environment	• Profile of Baduy Community • Environmental Care Principle in Baduy Community • Environmental Respect Practices Lingkungan	Student-made environmental awareness posters and evaluation of student understanding

2	Obedience to the Law	• Baduy Customary Law System • Application of Obedience to Law in Daily Life	through reflective discussion Student-created poster or drama and evaluation of understanding through reflection discussion.
3	Honesty	• Honesty Value of Outer Baduy Community • Implementation of Honesty Value	• Observation during role play and self-reflection journal. • Multiple choice and short-form tests.
4	Cooperation and cooperation	• The concept of cooperation and *gotong royong*. • Comparison of the values of cooperation of the Baduy community with the student environment	• Observation during discussion and role play, self-reflection journal • Group project
5	Simplicity	• The Concept of Simplicity in the Life of Baduy Community. • Comparison of the simplicity of the Baduy community and modern society	• Observation during discussion and role play, self-reflection journal • Group project
6	Democracy	• The concept of democracy in the life of Baduy indigenous people. • Comparing the application of democracy value in the Baduy Indigenous community with the application of democracy in school or modern society.	• Observation during discussion and role play, self-reflection journal • Group project

Table 2 is based on the results conducted by researchers through documentation and previous research related to local values owned by the outer Baduy tribe. Baduy community has a belief that humans should live in balance with nature. They believe everything depends on each other, and maintaining this balance is the key to a harmonious life. Nature is seen as a living entity that must be respected and protected. They believe nature has a spirit and spiritual power that must be respected and nurtured. Therefore, there is value in caring for and respecting the environment. The Baduy community's obedience to customary law reflects their commitment to cultural and spiritual values. Customary law regulates daily actions and shapes their way of life. Honesty is one of the core values in the Baduy community, and this principle underlies various aspects of their life. Baduy community has a specific view and practice regarding honesty integrated into their social and cultural structure. Honesty is a fundamental value in the Baduy community that is applied thoroughly in various aspects of their life. Daily life in the Baduy community relies heavily on cooperation and communal life. Every community member has a role and responsibility to help each other. In daily life, every community member has certain roles and responsibilities that contribute to the well-being of the Shared. Simplicity is the Baduy community's main characteristic, manifested in various aspects of their life. Their simple lifestyle reflects their personality and cultural values and becomes how to

maintain balance with nature and the community. The Baduy, despite living within a traditional framework and strongly maintaining customs, apply democratic values in how they manage their community life. Their social system, which is structured based on customs and traditions, contains elements of democracy in decision-making and community participation.

The six values were integrated into a learning model of local cultural values for students in elementary school. Next, the researchers conducted product development by compiling flowcharts and storyboards. The flowchart is used as a simulation flow and illustrates the storyboard to make it easier to visualize the display to be more organized. About the local cultural values of Baduy, the design of the application's main menu to the button is in the form of animation. Assessment of the material of the values to be developed is poured into an image that is used as a marker to be scanned using a smartphone camera. Thus, students can see the material through the augmented reality developed. This augmented reality program is developed through 3-dimensional object models and 3D blender software. Image upload is done on the Vuforia web to ensure a smartphone camera can scan the image. The development product that has been completed is validated by media experts and material experts.

Table 3. Media Expert Validation Test Results

No	Aspects of Validations	Scores
1	Material display	3
2	Color of marker images and 3-dimensional models	4
3	Font suitability with media	4
4	Quality of layout design	3
5	Conformity between material and simulation media	4
6	Simulation media display	4
7	Available menu features	3
8	Media attractiveness	4
9	Suitability of media with material	4
10	The suitability of simulation media with learning objectives	4
11	Ease of media operation	3
	Total	40

Based on Table 3, it can be shown that there are aspects that need to be improved on the appearance of the material, the quality of the layout design and the menu features available. This is because these three aspects have not been adapted to the characteristics of students in elementary school. However, after being converted, the media expert validation test results achieved 72%. Thus, the product developed is included in the feasible category.

Table 4. Material Expert Validation Test Results

No	Aspects of Validations	Scores
1	Clarity of material content	3
2	Relevance of material to learning objectives	4
3	Completeness of material	4
4	Presentation of simple and concrete material	4
5	Use of language	3
6	Suitability of material content to student needs	3

Total	21

Table 4 shows that the results of the validity test from material experts provide notes on the clarity of the material's content, the use of language, and the suitability of the material's content to the needs of students. This is because the use of language is still not adapted to the learning characteristics of fifth-grade elementary school students, and there are still sentences that are not standardized. However, the overall achievement level of this material expert validation test was 70%. In other words, the product developed is in the feasible category. Even so, researchers need to make revisions related to the products developed again.

The results of this study show that augmented reality-based local cultural values align with the principles of the independent curriculum, namely character development. This research also answers the study conducted by Wang (2019) Where the learning model can be developed through technological support, the results of this study illustrate that the current needs of elementary school students are character development using technology. Thus, an augmented reality-based learning model of Baduy local cultural values was developed. Widodo et al. (2020) also support this, where Baduy's local cultural values can make elementary school students understand tolerance. In contrast to Wastuti et al. (2021), the development of this learning model is carried out with augmented reality, which makes it easier for students to find learning resources related to local culture. Thus, students can easily achieve their learning goals. This research also provides an overview of the application of Baduk local cultural values in internalizing positive values in students in elementary schools. In addition, this research also shows that the learning model of local cultural values is not only limited to science concepts and only uses the e-book module(Utari et al., 2024; Ayunin et al., 2023; Nasution et al., 2021). This study has novelty because the learning model of local cultural values developed by researchers based on augmented reality can also realise the concept of social science that is fun for students in elementary schools. This differs from the study conducted by Lyesmaya et al. (2020) which is only limited to introducing local wisdom values through literacy education. Moreover, the results of this study are an innovation as an alternative medium for learning local cultural values, which is different from the study conducted by Utari et al. (2024), which integrates local cultural wisdom into e-books.

4. Conclusion

This study concludes that four steps are needed to develop a learning model: research and information, planning, preliminary product development, and preliminary field testing. The four steps are carried out in stages. Thus, this research can develop a learning model of augmented reality-based local cultural values worthy of being tested on elementary school students. Thus, this learning model becomes an alternative medium for teachers to introduce cultural diversity to students in elementary schools. In addition, this learning model product supports the six dimensions of the Pancasila learner profile contained in the independent curriculum. Students not only learn conceptually but can also adjust to technology such as augmented reality. This research has implications for the character of elementary school students through the cultivation of local cultural values, namely caring and respecting the environment, obeying the law, understanding the value of honesty, being able to work

together and cooperate, and understanding the concept of simplicity in life. This research has limitations on the method and the number of participants involved. Therefore, further research is expected to conduct product trials on a small and large scale to see the effectiveness of the augmented reality-based local cultural values learning module.

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