Development of Augmented Reality Assisted Textbooks to Develop Patriotism Character for Students of Grade 4th in Elementary School

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Abstract

This research was carried out with the aim of producing appropriate augmented reality-assisted textbooks to improve patriotism character of fourth grade elementary school students, to determine the effectiveness of appropriate augmented reality-assisted textbooks in increasing patriotism character of fourth grade elementary school students. This type of research is Research and Development (R & D) with reference to the development model of Brog & Gall (1983). The subject of preliminary field testing involved six students; the subject of the main field testing involved nine students. Data collection techniques used observation guidelines, interview guidelines, need analysis, assessment validation sheets, student response scales, teacher response scales, and self-assessment scales for the patriotism character. The data analysis used t test and MANOVA test with a significance level of 0.05. The results showed that: the developed textbook assisted with augmented reality has the criteria of "feasible" based on the validation of material experts, media experts, linguists, teacher responses, and student responses; the book is also proven to be effective in increasing patriotism character. The effectiveness of this textbook can be seen from the results of the t test and the MANOVA test which shows a significant increase in understanding the concept and patriotism character with a p value of 0.000 less than the significance of 0.05 ($p < 0.05$).

Keywords:
Augmented reality, textbooks, patriotism

1. Introduction

Globalization has an inevitable impact on technological developments. Information and various new things in the world are easy to access easily and cheaply by anyone. Through this information, the younger generation of Indonesia has come to know and love figures, products, films, and even culture from abroad. Globalization and global flows become something that cannot be avoided and occurs in various aspects (Spielmann Nathalie, Jennifer Smith Maguire, 2018), including in Indonesia. Apart from the positive impacts of globalization, Indonesia has experienced many changes, especially in cultural aspects which are increasingly fading among modern society. Not only affects adults, children also feel the impact of globalization itself. Based on interviews conducted with fourth grade teachers at SD Negeri Jetisjogopaten, Sleman, it can be seen that children's interest in playing traditional games has been shifted by the presence of the mobile legends trend, national and regional songs have also begun to emerge with the presence of the Korean wave, and children's knowledge about culture such as traditional houses, traditional clothes and traditional songs are also very limited.

One of the efforts that can be done is through education. Education is expected to be a place for children to get to know the culture of their nation as well as a filter against values that are incompatible with the Indonesian personality. The teacher must be able to present an attraction that is able to make students know and love the

culture of their own nation. One of the efforts to present a strong appeal and challenge and influence student interest is by presenting textbooks assisted by augmented reality. Augmented reality itself is an innovation in the field of technology that delivers information more contextually and is conveyed visually by stimulating the senses using a mobile device so that the information obtained is felt more realistically (Klimova, Anna Bilyatdinova, 2018).

Augmented reality is further developed as a supporter of textbooks that have the aim of forming the character of love for the country. This is also an effort to answer the challenges of the rapid development of technology in the world of children. Thus, the developed textbook is expected to be able to provide solutions in shaping the character of love for the country. It is hoped that the character of love for the country has not cultivated in students and understanding of concepts that are still low and less than optimal, as is known from the results of the needs analysis study conducted from 1 April - 1 May 2019 and for fourth grade elementary school students and teachers at SDN Jetisjogopaten. able to develop in a more positive direction with the development of textbooks assisted by agumented reality. With the visualization of images in 3D via a smartphone, students are interested in the appearance of the images presented, and with that they can easily understand the material provided. Thus the character of love for the country is expected to increase in line with the development of textbooks assisted by augmented reality.

2. Literature Review

2.1. Textbooks

Textbooks (lecture notes) are shown as a complement to the learning process with a characteristic scope that is limited by the curriculum and textbook syllabi which are specifically used as a learning tool in schools to support learning programs (Depdiknas, 2006). Masnur, (2010) adds that textbooks or textbooks are books that contain material descriptions of certain subjects or fields of study, which are systematically arranged and have been selected based on specific objectives, learning orientation, and student development, to be assimilated. It is concluded that textbooks are books used in learning activities that are arranged based on curriculum and syllabus with the aim of achieving learning objectives.

2.2. Augmented Reality

Children born in an information society are often called the digital generation. This presents a challenge that the entire education system must take into account. The education system changes in technical aspects and in pedagogical aspects (new pedagogical approaches and paradigms that suit the nature of learners). AR as an innovation in technology is something new as well as bridging technology developments with the needs of the digital generation in learning activities. Craig (2013) states that "Augmented reality is a medium which digital information is overlaid on the physical world that is in both spatial and temporal registration with the physical world and that is interactive in real time". While Bimber & Raskar (2013: 2) said that augmented reality is a medium that tries to display objects from the real world. Not much different from Alem, Leila (2011: 3-4) said that the basic way of working AR is to build a virtual world with a coordinate system that is identical to the real world.The use of AR in education can concretize the abstract, reduce the cognitive load and facilitate the teacher during the teaching and learning process to create independent learning. Furthermore, teaching AR can be an innovative approach that will change teaching and learning to be more attractive because teachers use theory and practice simultaneously (Ismail, 2018). The use of AR can also improve student learning outcomes, pedagogical processes, and interactions between students, teacher-students, or student material. In addition, AR can support learning in the physical, cognitive, and socio-cultural dimensions (Yuliono, Sarwanto, 2018).

Objects that can be seen in a more real way through AR make learning more interesting, because they have many topics that can be studied through images or visuals (Fakhrudin et al., 2017). reality also has a very positive impact on classroom learning. Motivation, fun, and curiosity are essential ingredients for any kind of educational play. The interaction between teachers and children with AR will increase motivation and collaboration. In addition, in the field of education, augmented reality offers several advantages, including: (i) the ability to encourage kinesthetic learning, (ii) support students in learning using 3D objects or introduce material from different perspectives or different angles to improve understanding, (iii) increase the level of student involvement and motivation in academic activities, and (iv) make it possible to provide contextual information, namely data about real objects related to learning activities (Diaz Christian , Mauricio Hincapie, 2015). In its use, even though augmented reality involves a cell phone, it will not reduce students' social interaction with the surrounding environment. By leveraging the right teaching strategies, AR can provide students with many benefits and lead to effective learning experiences. AR technology also provides opportunities to create a more enjoyable and interesting educational experience (Bistaman, Syed Z, 2017).

2.3. Patriotism

Character is the values of human behavior related to God Almighty, self, fellow human beings, environment, and nationality which are manifested in thoughts, attitudes, feelings, words, and actions based on religious norms, law, manners, culture. , and customs. Furthermore, education is defined as an effort carried out by a person or other group in order to mature to achieve a higher level of life or livelihood in a mental sense (Ramayulis, 2012).Characters can be called behavioral elements that suppress the somatopsychic elements possessed by humans. Character is closely related to aspects of behavior, attitudes, and qualities that differentiate a person from others (Rokhman, Fathur, M.Humb, Ahmad Syaifudinc, 2013).

Character education is a way to instill virtue in students, the virtues in question are honesty, integrity, respect, and self-discipline(Was C A, Woltz, D J, 2006). Furthermore, Linkona, (2013) revealed that character education is education to shape one's personality through character education, the results of which can be seen in one's real actions, namely good behavior, honesty, responsibility, respect for the rights of others, and hard work. The character itself is then translated into a moral or mental quality or strength, individual morals or character which is the driving force and driving force, as well as what differentiates it from other individuals (Furqon, 2010). Thus it can be concluded that character education is an attempt to instill praiseworthy behavior in an individual so that in him a commendable behavior is formed towards himself, others and the environment around him which is a personal characteristic so that it can differentiate between one individual and another.

Patriotism is a character that will be the focus of this research. The character of patriotism is love and loyalty to the country which can be an educational solution to teach cohesiveness and build social solidarity between citizens (Gusacov, 2018). Patriotism can be interpreted as an ideology that regulates all people's lives to unite, be wise, influence each other, have a complete understanding of unity (S. Uzakbayeva, et al., 2014:675). Patriotismis knowing and loving its national territory so that it is always vigilant and ready to defend Indonesia's homeland against all forms of threats, challenges, obstacles and disturbances that can endanger the survival of the nation and state by anyone and from anywhere (Asmoro, 2009). Patriotism can also be interpreted as an ideology that regulates all community life to be united, wise, influence each other, have a complete understanding of unity (Uzakbayeva S, Zhalgasova Sh, Beisembayeva A., 2014)

As has been mentioned in previous views, that character is an endeavor, thus something that can be worked on. The character itself is not only about the relationship to itself but also related to the environment around the individual. In Indonesia, character education has nine basic pillars of basic character, namely: 1) love for Allah and the universe and its contents; 2) responsibility, discipline, and independence; 3) honest; 4) respect and courtesy; 5) compassion, care and cooperation; 6) confident, creative, hard working, and never give up; 7) justice and leadership; 8) kind and humble, and 9) tolerance, peace-loving, and unity (Arthur, 2007).

The nine pillars above tend to be oriented towards building good character that comes from religious values, Pancasila, culture, and the goals of national education. The four sources gave birth to eighteen national character and cultural values which became the reference in the implementation of the 2013 curriculum learning. These character values include: "Religious values, honesty, tolerance, curiosity, national spirit, love the country, respect achievement, friendly / communicative, love peace, love to read, care for the environment, care for social, and responsibility (Muhammad, 2018).

Patriotism is an attitude of pride and care to protect and promote one's own people. The name of this attitude can appear to be reflected in the individual when the individual knows, understands the diversity and potential of his nation. When one is able to get to know one's own people well, one can have a sense of homeland love in him. The indicators that will be used as benchmarks for the love of the country in this study are as follows:
1) enjoying the diversity of ethnic groups in Indonesia;
2) admire the richness of culture and art in Indonesia;
3) admire the diversity of Indonesia's agricultural, fishery, flora and fauna products
4) cooperate with classmates of different ethnicity, socio-economic status.
5) love domestic products.

3. Methods

This research is development research with the aim of producing a product in the form of textbooks assisted by augmented reality. This study uses a mixed research approach with the type of Research and Development (R&D) research. Borg & Gall (1983) suggests educational research and development is a process used to develop and validate educational products. In addition to developing and validating educational results, research and development also aims to discover new knowledge through 'basic research', or to answer specific questions on practical issues through 'applied research', which is used for improving educational practices. This study will later

use the research design of Borg & Gall (1983) which consists of ten research steps. The steps in R&D are: (1) Research and data collection; (2) Planning; (3) Develop preliminary form of product; (4) Preliminary field testing; (5) main product revision); (6) main field testing; (7) Product revision of the main test results (Operational product revision); (8) Operational field testing; (9) Final product revision; and (10) Dissemination and implementation.

The initial product format development stage aims to develop learning designs to produce designs as a basis for producing textbooks. This stage begins to analyze the basic competencies, indicators and learning objectives on the theme 7 The Beauty of Diversity in My Country. After analyzing the various components that will be developed in the textbook, researchers begin to develop products. Activities at this stage include the following. The analysis of the feasibility of the Augmented Reality-Assisted textbook was done by tabulating all the data obtained from the expert's judgment. The quantitative data obtained were then converted by determining the range of scores and qualitative criteria. The determination of the range of scores and qualitative criteria in this study is useful to make it easier to determine the feasibility of the product being developed. The determination of the score range and product eligibility criteria refers to the following formula.

Table 1. Product Eligibility Criteria

Interval	Criteria
Ri + 1,5 Sdi < scor ≤ maximum score	Very Feasible
Ri < scor ≤ Ri + 1,5 Sdi	Feasible
Ri – 1,5 Sdi < scor ≤ Ri	Ri Feasible
Minimum total score < scor ≤ Ri – 1,5 Sdi	Not Feasible

Explanation:
Ri : ideal average = ½ (maximum score+minimum score)
Sdi : ideal standard deviation= 1/6 (maximum score+minimum score)
X : score obtained

Augmented Reality Assisted textbook is declared eligible for use if it obtains the "Eligible" criteria. Thus, if the expert's assessment has reached the “Feasible” criteria, this textbook has been declared good for use.

The validation stage is carried out to assess the feasibility of the initial product design before being tested. Experts involved in the validation process consist of material experts, media and language experts. After an expert assessment is carried out, the augmented reality assisted textbook is further revised based on input and suggestions from experts before being used for initial field trials. Products that have been validated and have been declared feasible are then tested in the field. The initial trial was limited by involving six fourth grade students of SD N Jetisjogopaten and one grade IV teacher as research subjects. Determination of the research sample for the initial trial using purposive random sampling technique with the provisions of the representation of students' abilities. Determining the ability of this student involves the role of the teacher in discussion and documentation of the value of student learning outcomes. Initial field trials were also carried out with the intention of knowing the responses of teachers and students to the development of textbooks.

The main field tests are applied to products that have previously undergone preliminary field tests and have been revised. The steps during the main field test implementation are as follows:

a. Determine nine students as a sample consisting of students with high, medium, and low learning abilities.
b. Conducting a learning simulation using products to students of SD Pendowoharjo with the help of a teaching classroom teacher.
c. Provide response questionnaire sheets to students and teachers.

The data from the student and teacher questionnaire responses were then recapitulated and analyzed. Suggestions obtained from teachers and students through response questionnaires are used as consideration for revising operational products. The operational test or field implementation test was carried out in the experimental group and the control group. The experimental group involved class IV SD Negeri Tlancap which included classes A and B. The steps taken in the field implementation test were as follows.

a. Choose a class to be used as an experimental group and a control group. Teachers and students in learning activities use products developed in the experimental class. Whereas in the control class, learning activities were carried out as on normal days, namely using pre-existing textbooks.
b. Test students' patriotism in learning activities in the experimental and control classes.
c. This operational product trial used a quasi-experimental research method. The results of operational product analysis are based on data analysis using SPSS version 21.0.

4. Data Collection

Broadly speaking, the initial design stage of product development consists of two parts, namely compiling the material in the form of a book, and then designing an augmented reality model. Product development is based on storyboarding. While the software used for making Augmented Reality applications includes Unity, Blender 3D, Affinity Design, Adobe Photoshop, Adobe Audition. The stages for product development are as follows.

a. Preparation of teaching materials according to basic competencies.
b. Determination of the illustration image
c. Marker and Augmented Reality visualization from 2D to 3D via a smartphone application.
d. Cover that makes book titles, classes, AR barcodes, and author information.
e. An introductory page that contains a cover page, a foreword, a table of contents, instructions for use, and the focus of the material to be studied.
f. The main section contains information on the five major islands in Indonesia, namely Sumatra, Java, Kalimantan, Sulawesi, Papua. Each of these islands contains a description of the island complete with maps, traditional houses, traditional weapons, traditional clothes, folk songs, ethnicities and types of economic activity.
g. Each image contained in the book is equipped with a marker that can be projected in 3 dimensions via a smartphone.
h. Exercise questions are packaged to train students' conceptual understanding.
i. The closing section is presented with a glossary, bibliography, and author's bio.

The augmented reality assisted textbook that has been developed is further validated by experts. The results of this validation will determine the appropriateness of the textbooks that have been developed as well as to identify aspects of textbooks that need to be improved. The product validation process was carried out by three expert validators, namely Prof. Dr. Suhardi, M. Pd as a linguist validator, Dr. Wuri Wuryandani, M. Pd as material expert validator, and Dian Wahyuningsih, M. Pd as media expert validator. The results of the expert's assessment can be seen from the assessment score and suggestions / comments to the experts.

Table 2. Result of Expert Assessment of Augmented Reality Assisted Textbook Materials

No	Aspect	Assessment Score	Category
1	Completeness of Material Content and Compatibility with KD	24	Very Feasible
2	Appropriateness of Exercises related to Concept Understanding of the Material	17	Feasible
Total		41	Feasible

Based on the score given by material experts, textbooks assisted by Augmented Reality are declared very suitable for use. This can be seen from the two aspects, each of which received a very feasible and feasible category. With the details of the completeness of the Material Content and Conformity with KD obtained a score of 24 and the suitability of training related to the conceptual understanding of the material obtained a score of 17.Thus, the material expert concludes that Augmented Reality-assisted textbooks are declared fit for use with revisions according to the advice given by experts Theory.

Table 3. Results of the Assessment of Augmented Reality Assisted Linguists

No	**Aspect**	**Assessment Score**	**Category**
1	Suitability of language	25	Very Feasible
2	Dictionary /Glosarium	11	Very Feasible
Total		36	Very Feasible

Augmented Reality-aided textbooks are declared very suitable for use. This is in accordance with the score of the linguist who gave a score of 25 on the aspect of language suitability with a very decent category and a score of 11 on the aspect of the dictionary or glossary with a very decent category. In addition to providing an assessment score, linguists also provide comments or suggestions that can be used for improvement so that Augmented Reality-aided textbooks are declared worthy of use.

Table 4. Results of Expert Assessment of Augmented Reality Assisted Textbook Media

No	Aspect	Assessment Score	Category
1	View	33	Feasible
2	Accuracy	10	Feasible
3	Augmented Reality Effects	9	Less feasible
4	Usefulness	11	Feasible
Total		73	Feasible

Based on the assessment made by media experts, textbooks assisted by Augmented Reality are deemed worthy of use with revisions according to suggestions. This can be seen from the display aspect which got a score of 33 in the feasible category, the accuracy aspect got a score of 10 in the decent category, the usefulness aspect with a score of 11 with a decent category. As for the aspect of the Augmented Reality effect category, there are several parts that need to be improved so that the media expert gives a score of 9 in the inadequate category. However, overall media experts state that textbooks assisted by Augmented Reality are feasible to use in accordance with the revisions that have been given. Thus, based on the judgment of material experts, linguists, and media experts, it can be concluded that AR-assisted textbooks are declared "Feasible" to be used.

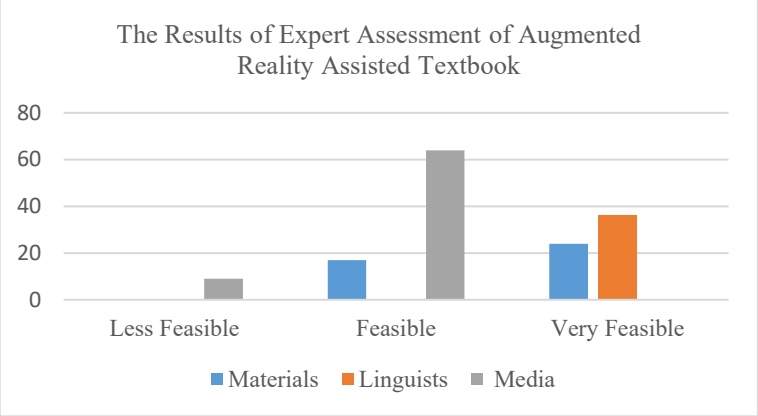

Figure 1. The Results of Expert Assessment of Augmented Reality Assisted Textbook

Furthermore, after being declared feasible by the experts, the initial stage trials and main field trials were carried out. The purpose of the trial was to get student responses and teacher responses to the use of AR-assisted textbooks. In the initial trial phase, a limited number of samples were used, namely 6 fourth grade students of SDN Jetisjogopaten. The following are the results of student and teacher responses at the initial field trial stage.

Table 5. Results of the Recapitulation of the Initial Field Test Student Response Questionnaire

Category	Total	Percentage (%)
Very Feasible	1	16,6
Feasible	5	83,4
Less Feasible	0	0
Not Feasible	0	0
Total	6	100
Average Score	24,6	
Category	Feasible	

Based on this table, it can be seen that as many as 16.6% of students gave a "Very feasible" response and 83.4% of students responded "Feasible".

Table 6. Results of the Recapitulation of the Initial Field Test Teacher Response Questionnaire

No	Aspect	Assessment Score	Category
1	Language Conformity	15	Very Feasible
2	Suitability of Material	30	Very Feasible
3	Use of AR Assisted Textbooks	10	Feasible
Total		55	Very Feasible

Meanwhile, for the teacher's response, it can be concluded that the AR assisted textbook is "very feasible" to be used to the next stage. This can be seen from the acquisition of each aspect assessed by the teacher. For the language suitability aspect, a score of 15 was obtained with the "Very Feasible" Category, for the material suitability aspect, a score of 30 was obtained with the Category "Very Appropriate", and for the aspect of usefulness of AR-assisted textbooks, a score of 10 was obtained with the Category "Very Feasible".

After being declared feasible at the initial field trial stage and having been revised according to comments and suggestions from teachers and students, then the main field trial was carried out. Just like the initial field trials, the main field trials were carried out with the aim of getting student and teacher responses, it's just that the number of samples used was larger, amounting to 9 students and located at SDN Pendowoharjo. Following are the responses of students and teachers at the main field trial stage.

Table 7. Results of Student Responses in the Main Field Test

Category	Total	Percentage (%)
Very Feasible	6	66
Feasible	3	34
Less Feasible	0	0
Not Feasible	0	0
Total	9	100
Average Score	26	
Category	Very Feasible	

Based on this table, it can be seen that as many as 66% of students gave a "Very feasible" response and 34% of students responded "Feasible". In addition, based on the comments / suggestions contained in the questionnaire, it can be seen that students are very enthusiastic about learning various new information contained in books. The three-dimensional view also helps students get a real picture of the pictures contained in the book. Students can more easily understand the material and claim to be more enthusiastic in exploring new information contained in books.

Table 8. Results of Teacher Responses in Main Field Trials

No	Aspect	Rating Score	Category
1	Language Conformity	15	Very Feasible
2	Suitability of Material	31	Very Feasible
3	Use of AR Assisted Textbooks	12	Very Feasible
Total		58	Very Feasible

Based on this table, it can be concluded that AR-assisted textbooks are "very feasible" to be used to the next stage. This can be seen from the acquisition of each aspect assessed by the teacher. For the language suitability aspect, a

score of 15 was obtained with the Category "Very Feasible", for the material suitability aspect, a score of 31 was obtained with the Category "Very Feasible", and the aspect of usefulness of AR assisted textbooks was obtained a score of 12 with the Category "Very Feasible. Furthermore, the self-assessment scale data was used to determine the effectiveness of AR-assisted textbooks in increasing the patriotism of students. The self-assessment scale is given to students before learning activities and after learning activities. These activities were carried out both in the experimental class and in the control class. The results of self-assessment of the patriotism before receiving treatment or before the implementation of learning activities can be seen in table 9.

Table 9. Results of Data Analysis of the Pretest Patriotism

No	Score Range	Category	After	
			KK	KE
1	48,76 < X < 60,00	Very Eligible	0	0
2	37,50 < X < 48,75	Eligible	2	0
3	26,25 < X < 37,50	Eligible Enough	13	15
4	15,00 < X < 26,25	Less Eligible	5	5
Total			20	20
Average			49,9	48,2
Score Maximum			63,3	58,3
Score Minimum			49,9	40,0

The table shows a similar difference between the mean scores in the experimental class and the control class. The mean in the control class shows a value of 49.9 and in the experimental class has a mean value of 48.2. As for the treatment in the experimental class with AR-assisted textbooks and the control class without AR-assisted textbooks, it can be seen that the results of postetst data analysis of the character of love for the country are as follows.

Table 10. Results of Data Analysis of the Posttest Patriotism

No	Score Range	Category	After	
			KK	KE
1	48,76 < X < 60,00	Very Eligible	0	12
2	37,50 < X < 48,75	Eligible	2	8
3	26,25 < X < 37,50	Eligible Enough	11	0
4	15,00 < X < 26,25	Less Eligible	7	0
Total			20	20
Average			58,7	80,2
Score Maximum			68,3	86,7
Score Minimum			35,0	68,3

Table 5 shows the posttest results of patriotism in the control and experimental classes. The mean of the control class was 58.7 in the "Good" category, while the mean in the experimental class was 80.2 in the "Very Good" category. Thus based on this table it can be seen the difference in results between the control class and the experimental class.
Thus, based on this table it can be seen the difference in results between the control class and the experimental class. The following is a diagram of the results of the pretest and posttest in the control class and the experimental class.

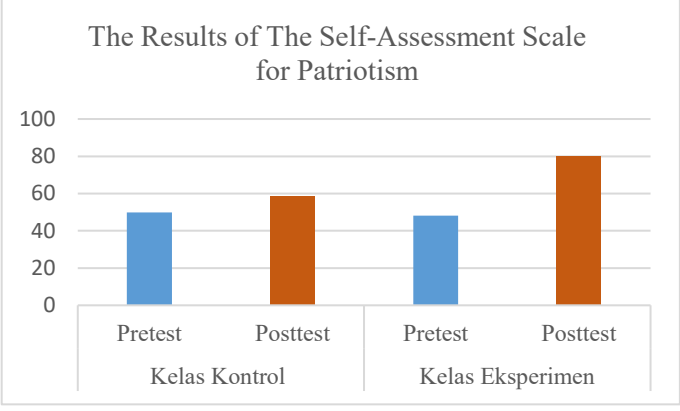

Figure 2. The Results of the Self-Assessment Scale for the Patriotism in the Operational Field Trial.

The MANOVA hypothesis test was conducted to determine the effectiveness of AR-assisted textbooks in increasing the character of love for the country. The formulation of the hypothesis testing provisions in this study are as follows.

H0: There is no character of patriotism between fourth grade elementary school students who use and do not use AR-assisted textbooks.

Ha: There are differences in the character of patriotism between grade IV elementary school students who use and do not use AR-assisted textbooks.

The criteria for acceptance of H0 at the 5% significance level are based on the significance obtained. If the significance> 0.05 then H0 is accepted, conversely if the significance <0.05 then H0 is rejected. The following is a table of the MANOVA test results.

Tabel 6. Hasil Uji MANOVA

Effect	Value	F	Hypothesis df	Error df	Sig
Faktor_Kelas_*Hotelling's Trace*	6.522	120.653[a]	2.000	37.000	0.000

Based on the table above, it can be seen that the significance value of the Hotelling Trace test is 0.000 <0.05, it can be concluded that there is a significant difference between the patriotism between students who use augmented reality assisted textbooks and students who do not use assisted textbooks. augmented reality.

5. Results and Discussion

Learning is an activity that involves various aspects ranging from educators, students, infrastructure to curriculum that supports the implementation of learning activities. One of the components in learning activities is textbooks. Textbooks are a type of book used in teaching and learning activities, which are arranged with a flow and logic in accordance with the learning plan. Textbooks are arranged according to the learning needs of students or students to achieve specific learning objectives or competencies.

One of the requirements for developing textbooks is that they are adapted to the character of students. Piaget's theory of cognitive development states that children aged 7-11 years are in a concrete operational phase. Children at this age have not been able to optimize their logical reasoning abilities. Another characteristic of children at this age is that they are able to think effectively about objects that they find in everyday life.
Furthermore, Piaget's cognitive development theory explains that any material presented to students who are in the concrete operational phase must be visualized in real terms to students. Thus it can be concluded that the cognitive development of fourth grade elementary school students is in a concrete operational phase. So that in delivering material or in an effort to instill conceptual understanding to students, a textbook or media is needed that is able to facilitate students' concrete thinking skills so that children are able to develop their thinking skills effectively.

The presence of Augmented Reality (AR) assisted textbooks can facilitate the cognitive development of students who are in the concrete operational phase. AR features presented in textbooks can visualize abstract objects in presenting the teaching materials contained in them. The presence of books that are able to make material more concrete will certainly make it easier for students to understand the concepts of material contained in textbooks. In addition, AR-assisted textbooks can also be used as a fun and easy-to-use independent learning resource for students. The use of AR in learning activities can concrete abstract, reduce the cognitive load and facilitate teachers during the teaching and learning process to create independent learning (Ismail, 2018). The material about the diversity that exists in Indonesia is material that has a lot of content. Starting from the diversity of traditional houses, traditional clothes, traditional dances to folk songs. It will be less easy to understand if students only study the material only through reading texts, while students' thinking abilities are at the concrete operational stage. To introduce this diversity in real situations also requires a lot of time and money. For this reason, it is important to present textbooks that are able to facilitate students' thinking skills and are able to convey material more realistically. AR can be used as an opportunity to get acquainted with concepts that cannot be achieved in the physical world. So that the application of the use of AR applications in education is considered relevant because it can improve student achievement and their motivation to learn (Garzón J, Kinshuk, Baldiris S, Gutiérrez J, 2020).

The development of AR-assisted textbooks is also used as an effort to develop the character of love for the country. Patriotismcan be interpreted as an ideology that regulates all people's lives to be united, wise, influence each other, have a complete understanding of unity (Uzakbayeva S, Zhalgasova Sh, Beisembayeva A., 2014) and the development of the patriotism can be done by introducing Love for the country which can be marked with pride in ethnic diversity, natural wealth, culture, and a joy to learn (Sri, 2011). Efforts are being made to instill pride in cultural diversity by introducing various cultural diversity in Indonesia in a fun way. The images of traditional houses, traditional weapons, and traditional clothes are not only introduced through reading texts but are introduced through 3D views. So that students can see in real terms how detailed, unique, and special the cultural diversity in Indonesia is. Not only that, through the AR display students can also sing folk songs directly. Students can directly get to know and learn together without having to feel confused about how to sing folk songs in the right tone. Thus, the use of AR applications with the help of smartphones is expected to attract students to be more proud of the diversity that exists in Indonesia and make it easier for students to understand the concept of cultural diversity in Indonesia.

Motivation, fun and curiosity are essential ingredients for any kind of educational game. By utilizing the right teaching strategies, AR can provide many benefits to students and lead to effective learning experiences. AR technology also provides opportunities to create a more enjoyable and interesting educational experience (Bistaman, Syed Z, 2017). Through the use of interesting textbooks and facilitate students' understanding, it will indirectly make students interested in learning more and understanding the concepts of the material in it. Through the display of traditional houses, traditional clothes and dances, traditional weapons, economic activities, and folk songs in the AR textbooks, it is hoped that students will have pride and patriotism for the diversity that exists in Indonesia.

Products developed based on preliminary studies, planning, and development of textbook formats, are then validated by experts to assess their feasibility. The results of the feasibility/validation test as presented in the table are presented in Table 2 (material expert), Table 3 (language expert), and Table 4 (media expert). Based on data obtained from material experts (Table 2), AR-assisted textbooks were declared very feasible to use. This can be seen from the two aspects, each of which is categorized as very feasible and feasible. In the aspect of Completeness of Material Content and Conformity with KD, a score of 24 was obtained, while in the aspect of Appropriateness of Exercises related to Conceptual Understanding of the Materials, it obtained a score of 17. This means, according to material experts, AR-assisted textbooks developed in this study are suitable for use with revisions according to the expert's opinion. material.

In contrast to the feasibility in terms of material content, AR-assisted textbooks are considered "very feasible" in terms of the language used (Table 3). This conclusion is based on the scores given by linguists. In the aspect of language suitability, a score of 25 (very decent) was obtained, while in the dictionary or glossary aspect, a score of 11 was obtained (very decent). But in addition to providing scores, linguists also provide a number of recommendations as well as material experts. Therefore, AR-assisted textbooks were declared very suitable for use with some improvements according to the recommendations of linguists.

Similar to the assessment of textbook materials, the feasibility of AR-based textbooks as media is considered "appropriate", with a number of improvements according to recommendations from media experts. This conclusion was obtained based on the assessment of media experts (Table 3). In terms of appearance, obtained a score of 33 (decent). Meanwhile, in terms of accuracy, usefulness, AR effect, a score of 10 (adequate), 9 (less feasible), and 11 (feasible) were obtained, respectively. From the point of view of the AR effect, the textbooks developed were considered inadequate. But overall, media experts stated that this textbook was suitable for use in learning. Of course, with some improvements made according to the recommendations of media experts first.

In addition to referring to the theory that AR applications can motivate, improve understanding of concepts and learning achievement, experts (material, language, and media experts), teacher and student responses also provide the "Appropriate" category to AR-assisted textbooks. This view is strengthened by the results of research showing the Hotelling Trace test results are $0.000 < 0.05$, so it can be concluded that there is a significant difference between understanding the concept and the character of love for the homeland between students who use AR-assisted textbooks and students who do not use textbooks. AR assisted. So that based on the results of these trials, it can be concluded that there is an increase in the character of patriotism.

6. CONCLUTION

The results of the independent t-test showed that there were differences in the patriotism character between students who used augmented reality-assisted textbooks in learning activities, with a significance value of $0.000 < 0.05$. Not

different from the results of the independent t test, the results of the paired sample t test showed that there were differences in understanding the patriotism character before and after using augmented reality-assisted textbooks with a significance value of 0.000 <0.05. Thus, it can be concluded that augmented reality textbooks are effective in enhancing the patriotism character.

References

Alem, Leila. *Recent Trends of Mobile Collaborative Augmented Reality Systems.* London: Springer. (2011)
Arthur, J. Character Education In UK Schoo*l*. University of Brimingham. *Journal of Moral Education.(2007)*
Asmoro, A. *Filsafat Pancasila dan Kewarganegaraan*.Semarang: Rasail Media Grup. (2009)
Bimber, O., & Raskar, R. *Augmented Reality in The Classroom*. Computer, 45(7), 56-63. Doi: 10.1109/mc..2012.111 (2013)
Bistaman, Syed Z, S. A. The Use of Augmented Reality Technology for Primary School Education in Perlis, Malaysia. *Journal of Physics*. (2017)
Borg, W.R. & Gall, M. D. G. *Educational Research: An Introduction, Fifth Edition*. New York: Longman.
Craig, A. B. Understanding Augmented Reality: Concept and Aplication. *Elsevier. (1983)*
Depdiknas, P. P. *No TitlePedoman Penulisan Buku Ajar*. Jakarta: Pusat Perbukuan Depdiknas. (2006)
Diaz Christian , Mauricio Hincapie, G. M. How the Type of Content in Educative Augmented Reality Application Affects the Learning Experience. *Procedia Computer Science*, *75*, 205–212. (2015)
Fakhrudin, a., Yamtinah, s., & Riyadi, r. Implementation of Augmented Reality Technology in Natural Sciences Learning of Elementary School To Optimize the Students' Learning Result. *Journal Plus Education*, *19*(1/2018), 92–102. https://doi.org/10.24250/jpe/1/2018/af/sy/rr (2017)
Furqon, H. *Pendidikan Karakter: Membangun Peradaban Bangsa*. Solo: UNS Press&Yuma Pustaka.(2010)
Garzón J, Kinshuk, Baldiris S, Gutiérrez J, P. How do pedagogical approaches affect the impact of augmented reality oneducation? A meta-analysis and research synthesis. *Elsevier Inc*, 1. (2020)
Gusacov. Education for patriotism and the Arab-Israeli sector. *International Journal of Educational Development*, *60*, 138–148. (2018)
Ismail, M. E. The Effect of an Augmented Reality Teaching Kit on Visualization, Cognitive Load and Teaching Styles. *Jurnal Pendidikan Teknologi Dan Kejuruan*, *24*, 178–184. (2018)
Klimova, Anna Bilyatdinova, dan A. K. No Title Existing Teaching Practices in Augmented Reality. *Procedia Computer Science*, *136*, 5. (2018)
Kiryakova, G., Nadezha A., Lina Y. The Potential of Augmented Reality to Transform Education into Smart Education. *TEM Journal.* Vol. 7: 556 65. (2018)
Masnur, M. *Text Book Writing: Dasar-dasar Peemahaman, Penulisan, dan Pemakaian*. Yogyakrta: Ar-Ruzz Media. (2010)
Muhammad, Y. *Pendidikan Karakter: Landasan, Pilar, dan Implementasi.* Jakarta: Kencana. (2018)
Ramayulis. *Ilmu Pendidikan Islam*. Yogyakarta: Kalam Mulia Group. (2012)
Rokhman, Fathur, M.Humb, Ahmad Syaifudinc, Y. No Title. *Character Education For Golden Generation 2045 (National Character Building for Indonesian Golden Years)*, 1161 – 1165. (2013)
Spielmann Nathalie, Jennifer Smith Maguire, S. C. Product patriotism: How consumption practices make and maintain national identity. *Journal of Business Research*, *121*, 389–399. (2018)
Sri, N. *Pendidikan Karakter*. Yogyakarta: Familia. (2011)
Thomas, L. *Mendidik untuk Membentuk Karater, terjemahan J. A. Wamaungo*. Jakarta: Bumi Aksara. (2013)
Uzakbayeva S, Zhalgasova Sh, Beisembayeva A., K. G. The Patriotism Education Content At The Present Stage. *Elsevier Inc*, *41*, 675 – 679. (2014)
Was C A, Woltz, D J, D. C. Evaluating character education programs and missing the target: A critique of existing research. *Educational Research Review*, *1(2)*, 148–156. (2006)
Yuliono, Sarwanto, P. R. The Promising Roles of Augmented Reality in Educational Setting: A Review of the Literature. *International Journal of Educational Methodology*, *4*, 125–132. (2018)

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