

ORIGINAL

The Effect of the Project Citizen Augmented Reality (PjCAR) Learning Model on Elementary School

El efecto del modelo de aprendizaje de Realidad Aumentada Ciudadana del Proyecto (PjCAR) en la escuela primaria

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ABSTRACT

Introduction: the study examines the effect of the Project Citizen Augmented Reality (PjCAR) learning model on students' national awareness competence. The research was conducted in Langsa, Aceh, with fifth-grade elementary school students as the sample.

Method: a quasi-experimental research design was employed, and data were collected using tests, questionnaires, observations, and documentation. The validity and reliability of the data were tested, followed by prerequisite tests (homogeneity and normality) and hypothesis testing (t-test and n-gain test).

Results: the results showed a significance value (2-tailed) of 0,001, smaller than 0,05. The average national awareness competence, comprising national sentiment and national spirit indicators, increased from 148,11 to 164,52 after implementing the PjCAR model. Meanwhile, cognitive understanding of national awareness improved from 66,30 to 80,43.

Conclusions: these findings indicate a significant difference between pretest scores (before treatment) and posttest scores (after implementing the PjCAR model). This also suggests that students' national awareness competence improved after applying the PjCAR model in Pancasila Education for fifth-grade students.

Keywords: Learning Model; Project Citizen; Augmented Reality; Elementary School.

RESUMEN

Introducción: el estudio examina el efecto del modelo de aprendizaje del Proyecto Ciudadano de Realidad Aumentada (PjCAR) en la competencia de conciencia nacional de los estudiantes. La investigación se llevó a cabo en Langsa, Aceh, con estudiantes de quinto grado de escuela primaria como muestra.

Método: se empleó un diseño de investigación cuasi-experimental y los datos se recolectaron mediante pruebas, cuestionarios, observaciones y documentación. Se probó la validez y confiabilidad de los datos, seguido de pruebas de prerrequisitos (homogeneidad y normalidad) y pruebas de hipótesis (prueba t y prueba n-gain).

Resultados: los resultados mostraron un valor de significancia (2 colas) de 0,001, menor a 0,05. La competencia promedio de conciencia nacional, que consiste en indicadores de sentimiento nacional y espíritu nacional, aumentó de 148,11 a 164,52 después de implementar el modelo PjCAR. Mientras tanto, la comprensión cognitiva de la conciencia nacional mejoró de 66,30 a 80,43.

Conclusiones: estos hallazgos indican una diferencia significativa entre los puntajes previos a la prueba (antes del tratamiento) y los puntajes posteriores a la prueba (después de implementar el modelo PjCAR). Esto también sugiere que la competencia de conciencia nacional de los estudiantes mejoró después de aplicar el modelo PjCAR en la educación Pancasila para estudiantes de quinto grado.

Palabras clave: Modelo de Aprendizaje; Proyecto Ciudadano; Realidad Aumentada; Escuela Primaria.

INTRODUCTION

Every nation possesses distinct characteristics marked by its ethnic, racial, and socio-cultural diversity. Countries with large populations inevitably exhibit significant differences, which can potentially become weaknesses threatening the nation's stability. This is evident in Indonesia, a multicultural nation with diverse cultures spread across its archipelago.⁽¹⁾ To mitigate the risks posed by such diversity, it is essential for every citizen to possess a sense of national awareness.

National awareness refers to the perspective of the Indonesian people regarding themselves and their environment, emphasizing unity and integrity in societal, national, and state life.^(2,3) Strengthening national awareness is a critical aspect embedded in national education policies.⁽⁴⁾ National awareness encompasses various elements, including history, culture, national identity, and a critical attitude toward societal issues.⁽⁵⁾ Ideally, this perspective should be instilled in Indonesian citizens from an early age, as it reflects the noble values of the nation in fostering a state-oriented life. National awareness should be ingrained in daily life and demonstrated through three key aspects: understanding nationalism, a sense of nationalism, and a spirit of nationalism.⁽⁶⁾ Every citizen should ideally comprehend the importance of patriotism and adhere to the principles of lawful living.

Unfortunately, the current understanding of national awareness among the younger generation remains low. Based on a 2018 survey by the Indonesian Survey Institute (Lembaga Survei Indonesia), only 6,2 % of students demonstrated a strong grasp of national awareness.⁽⁷⁾ Similarly, a 2022 survey by Litbang Kompas and the Center for National Studies (Pusat Studi Kebangsaan Indonesia, PSKI) revealed that students' understanding of Pancasila is alarmingly limited, with only 21,7 % of students comprehending Pancasila-related material. These findings highlight the fragility and vulnerability of students' understanding of national awareness.

In response to these issues, one potential solution is to actualize national awareness through education. According to Article 3 of Law No. 20 of 2003, schools serve as effective spaces for instilling the values of national awareness.⁽⁸⁾ Education in schools is structured to be comprehensive, systematic, and conducive to learning. Students have the potential to contribute behaviors and ideas that advance the nation, while schools are responsible for nurturing intelligent and morally grounded individuals. Education also plays a vital role in building knowledge, values, attitudes, and actions through active and natural engagement with real-life experiences.⁽⁹⁾

The implementation of education is realized through the application of a curriculum. In recent years, Indonesia has adopted the Kurikulum Merdeka (Independent Curriculum), which embodies the philosophy of lifelong learning aligned with Pancasila values. This is reflected in the Pancasila Student Profile. The formulation of the Pancasila Student Profile is based on considerations of global contextual changes that must be addressed, including shifts in the workforce, social, cultural, and political dynamics, as well as national interests related to the nation's culture, nationalism, and national development agendas as mandated by the 1945 Constitution and Pancasila.⁽¹⁰⁾

The scope of national awareness is primarily derived from citizenship education. Citizenship Education focuses on shaping citizens who understand and can fulfill their rights and obligations to become intelligent, skilled, and character-driven Indonesian citizens, as guided by Pancasila and the 1945 Constitution.⁽¹¹⁾ Citizenship Education becomes meaningful when it is designed and developed based on students' conditions as learning subjects and the cultural communities in which they live. However, understanding national awareness also stems from other factors, such as the wise use of technology. Rapid technological advancements require students to actively master and engage with these tools.

Innovative projects in Citizenship Education (Pendidikan Kewarganegaraan) are highly anticipated to facilitate the strengthening of students' national awareness. One recommended innovation is the Project Citizen approach. Project Citizen is developed primarily from a critical or reflective approach. According to Budimansyah and Karim,⁽¹²⁾ Project Citizen learning is recommended for fostering critical thinking and problem-solving skills, as well as engaging participants through practical learning experiences. Project Citizen provides a platform for developing the character of national awareness, encompassing nationalism, patriotism, and multiculturalism. As highlighted by Romlah,⁽¹³⁾ the Project Citizen learning model in Citizenship Education is considered effective in nurturing national character among young citizens.

Considering the importance of technology in education, the integration of technology into Project Citizen represents a groundbreaking advancement. For instance, the use of augmented reality (AR) technology in learning is highly suitable. Augmented reality is a technology that projects virtual objects, either 2D or 3D, into the real world, allowing these virtual objects to be seen, touched, and heard in a real-world context.⁽¹⁴⁾ AR

aims to simplify complex concepts for users by bringing virtual information into their environment, enhancing user perception and interaction with the real world.⁽¹⁵⁾ The application of AR in Citizenship Education at the elementary school level can be an effective way to help students comprehend the material being taught and develop the skills necessary to grow into responsible individuals ready to shoulder their civic duties.

The integration of the Project Citizen learning model with augmented reality is referred to as Project Citizen Augmented Reality. The Project Citizen Augmented Reality (PjCAR) learning model is a new instructional approach that combines Project Citizen with Augmented Reality within its framework. PjCAR is an active learning model that enables students to engage in contextual problem-solving using Augmented Reality media. Through project-based activities, this model is designed to enhance elementary school students' national awareness.

Several related studies have been conducted on this topic. Rochmah et al.⁽¹⁶⁾ One study investigated the development of Augmented Reality-based media incorporating national awareness within the theme of national heroes. The findings indicated that the development process followed several stages, including identifying potential and problems, data collection, product design, design validation, design revision, and usability testing. Nurdiansyah et al.⁽¹⁷⁾ another study examined the effectiveness of the Project Citizen learning model in improving the cultural literacy of fifth-grade students at SD Negeri 2 Tahunan. The results demonstrated that the Project Citizen model effectively enhanced students' cultural literacy. Kamasi and Nangoy⁽¹⁸⁾ developed an Augmented Reality-based application for introducing national heroes as part of the "My Hero" theme in the curriculum. The application, designed for Android smartphones, underwent black-box testing, yielding a 100 % feasibility score, indicating a highly viable implementation.

Hidayati and Tirtoni⁽¹⁹⁾ investigated the impact of the Project Citizen model on enhancing critical thinking skills among fifth-grade students in citizenship education on cultural diversity. The findings indicated a significant improvement in students' critical thinking abilities, as evidenced by the difference between pre-test and post-test results after implementing the Project Citizen learning model. Another study by Angelika⁽²⁰⁾ examined an Augmented Reality-based learning application on national awareness for the Android platform. The User Acceptance Test (UAT) results showed a 94,7 % approval rating, indicating strong user agreement on the application's effectiveness. This study aims to examine the influence of the Project Citizen learning model integrated with Augmented Reality on the national awareness of fifth-grade elementary school students. The key distinction from previous studies lies in the research subjects, study location, and the developed instructional materials. Unlike prior research, this study integrates the Project Citizen Augmented Reality (PjCAR) model, contributing to the novelty of the research. Based on the discussion above, this study seeks to determine the impact of the Project Citizen Augmented Reality (PjCAR) learning model on the national awareness of fifth-grade elementary school students in Langsa, Aceh.

METHOD

Table 1. Test Blueprint for national awareness Understanding

Indicator	Sub-indicator	Item number
Truth	Freedom of speech and expression	12
	Belief and worship	2
Equality and Justice	Equality before the law	5
	Justice	11
Respect for Dignity	Fairly respecting human dignity	16
	Protecting and valuing others' opinions	1
Integrity	Moral responsibility	14
	Ethical behavior	13,18
Accountability	Personal responsibility	17
	Accepting risks of actions	3
Honesty	Being honest	6,19
	Consistency between words and actions	10
Acceptance and Appreciation of Diversity	Respect for minorities/disadvantaged groups	8
	Accepting and valuing differences	7
Responsible Freedom	Creating a safe space for idea expression	15
	Responsibility toward others	20
Cooperation	Willingness to collaborate	4
	Practicing positive teamwork	9

This study employs a quantitative research approach using a quasi-experimental design. A quasi-experiment is a type of research that involves treatment and impact measurement but does not use random assignment to establish comparisons for assessing changes.⁽²¹⁾ This design was chosen to examine the effect of the Project Citizen Augmented Reality (PjCAR) learning model on students' national awareness.

The study was conducted in Langsa, Aceh, involving five elementary schools. The research subjects were specifically fifth-grade students selected through purposive sampling. Participants were chosen based on similar cognitive abilities, determined by their mid-term examination (UTS) scores from the 2022/2023 academic year.⁽²²⁾ Data were collected using test instruments, questionnaires, observations, and documentation. The test instrument was used to assess students' understanding of national awareness, one of its key indicators. A written multiple-choice test consisting of 20 questions was administered to measure this aspect. The test blueprint for assessing students' understanding of national awareness is presented in table 1.

The questionnaire instrument was used to measure the dependent variable, which is national awareness. A total of 50 questionnaire statements were distributed to fifth-grade elementary school students in the research area. The questionnaire blueprint is presented in table 2.

Aspect of national awareness	Indicator	Statement Number	
		(+)	(-)
National Understanding	Truth	1,2	
	Equality and Justice	3,4	
	Respect for Dignity	5,6	
	Integrity	8	7
	Accountability	10	9
	Honesty	11,12	
	Acceptance and appreciation of diversity	13,14	
	Responsible Freedom	15,16	
	Cooperation	18	17
	Affection	20	19
National Sentiment	Compassion	21,22	
	Harmony		23,24
	Tolerance	26	25
	Care and sharing	27,28	
	Interdependence	29,30	
	Understanding others' emotion	31	32
	Gratitude	33,34	
	Respect for law	35,36	
	Responsible Freedom	38	37
	Equality	39,40	
National Spirit	Self-discipline	41,42	
	Active citizenship	43,44	
	Openness	45	46
	Critical thinking	47,48	
	Solidarity	49,50	

Documentation was used to verify student learning outcome records maintained by teachers. Observations were conducted to assess the implementation of the PjCAR learning model, specifically evaluating the accuracy of instructional steps in accordance with the prescribed model.

All instruments underwent validity and reliability testing. Validity testing was conducted to determine whether an instrument accurately measures what it is intended to measure. According to Taherdoodt and Hamta,⁽²³⁾ validity refers to the extent to which an instrument's items reflect the content it aims to generalize. In this study, test validity was determined using Karl Pearson's product-moment correlation coefficient.⁽²⁴⁾ In addition, reliability testing was conducted to assess the consistency of the instrument. Test reliability refers to the extent to which a test produces stable and consistent scores over repeated administrations.⁽²⁵⁾ The reliability of the multiple-choice test instrument was measured using Cronbach's Alpha formula.

Data analysis was performed to test the proposed hypotheses. The analysis included prerequisite tests and hypothesis testing, processed using SPSS version 29. The prerequisite tests included normality and homogeneity tests. The normality test assessed whether the sample was drawn from a normally distributed population,⁽²¹⁾ conducted using the Kolmogorov-Smirnov test with Lilliefors Significance Correction at a significance level of

$\alpha = 5\%$. The homogeneity test examined whether the analyzed data originated from a population with equal variance and was performed using Bartlett's test with a chi-square statistical approach.

Meanwhile, hypothesis testing was conducted in accordance with the experimental design used, which involved comparing conditions before and after the use of the module (Before-After Design). The Before-After Design is known as the One Group Pretest-Posttest Design.⁽²⁶⁾ Before working with the module, students completed a pretest to assess their initial abilities. After understanding and using the module, they completed a posttest to measure the final outcomes. The results were then compared using a paired t-test with SPSS version 29. In addition to the paired t-test, an N-gain analysis was conducted to determine the effectiveness of the PjCAR learning model guidebook in fostering national awareness. The N-gain score analysis was also performed using SPSS version 29.

RESULT AND DISCUSSION

Validity Test

National awareness was measured through a national awareness test, which included aspects of national understanding, national sentiment, and national spirit. The cognitive test instrument was analyzed using SPSS version 29 before being implemented in PjCAR-based learning to assess its validity and reliability. An instrument should be evaluated using corrected item-total correlation and product-moment correlation at a 5% significance level. The significance test was conducted by comparing the calculated r-value (r-hit) with the critical r-table value for degrees of freedom ($df = n - 2$), where n represents the sample size, with an alpha level of 0,05. In the validity test conducted with a trial sample of 42 students, the degrees of freedom were calculated as $df = 42 - 2 = 40$, resulting in an r-table value of 0,312. This means that if the calculated r-value exceeds 0,312, the test item is considered valid.

No. of item	r-count	r-table	Description
1	0,680	0,312	Valid
2	0,760	0,312	Valid
3	0,539	0,312	Valid
4	0,335	0,312	Valid
5	0,680	0,312	Valid
6	0,760	0,312	Valid
7	0,475	0,312	Valid
8	0,451	0,312	Valid
9	0,691	0,312	Valid
10	0,372	0,312	Valid
11	0,749	0,312	Valid
12	0,461	0,312	Valid
13	0,423	0,312	Valid
14	0,483	0,312	Valid
15	0,749	0,312	Valid
16	0,539	0,312	Valid
17	0,485	0,312	Valid
18	0,483	0,312	Valid
19	0,549	0,312	Valid
20	0,335	0,312	Valid

Based on the validity test, all 20 test items were found to be valid, as the calculated r-value exceeded the critical r-table value. This confirms that all test questions were valid for measuring national awareness.

Reliability Test

The reliability test results indicated a Cronbach's Alpha value of 0,732. This value was derived from the calculation based on 20 valid test items. Since the obtained Cronbach's Alpha exceeds the minimum threshold of 0,70, it can be concluded that the national awareness test is reliable.

Cronbach's Alpha	N of Items
0,732	21

Normality and Homogeneity Tests

The normality test results showed that the Asymp. Sig. (2-tailed) value obtained using the Shapiro-Wilk test was 0,087 for the pretest data and 0,573 for the posttest data. Since both values exceed 0,05, the data are considered normally distributed. For the homogeneity test, the Levene's test result was 0,080, which is also greater than 0,05. This indicates that the data meet the assumption of homogeneity. The results of the Shapiro-Wilk and Levene's tests conducted in this study are presented in table 5.

Table 5. Normality and Homogeneity Test Results			
Data		Shapiro-Wilk Statistics	Levene Statistics
National Awareness	Pretest	0,087	0,080
	Post Test	0,573	

Paired Sample T-Test

The Paired Sample T-Test was conducted after confirming that the pretest and posttest scores met the assumptions of normality and homogeneity through the Shapiro-Wilk and Levene's tests. The normally distributed and homogeneous data were analyzed using a Paired Sample T-Test in SPSS version 29, as shown in table 6.

Table 6. Paired Sample T-Test										
Mean		Paired Differences				t		df	Significance	
		Std. Deviation	Std. Error Mean	95 % Confidence Interval of the Difference					One-Sided p	Two-Sided p
Pair 1	PRETEST POSTTEST	-16,413	10,138	1,057	-18,512	-14,314	-15,529	91	<,001	<,001
Pair 2	PRE_WK - POST_WK	-14,130	9,247	,964	-16,045	-12,216	-14,658	91	<,001	<,001

Based on table 6, the significance value (2-tailed) is 0,001, which is smaller than 0,05 ($0,001 < 0,05$). This indicates a significant difference between the pretest and posttest scores for both the national awareness questionnaire and the cognitive test on national understanding before and after the implementation of the PjCAR model in the Pancasila Education subject at the elementary school level. Thus, it can be concluded that the application of the PjCAR model has a significant impact on the national awareness of fifth-grade elementary school students.

The data were further analyzed descriptively, revealing that the average national awareness score—comprising indicators of national sentiment and national spirit—increased from 148,11 to 164,52. Similarly, the cognitive understanding of national awareness improved from 66,30 to 80,43 after implementing the PjCAR model. These findings indicate that students' national awareness significantly improved after applying the PjCAR model in the Pancasila Education subject for fifth-grade elementary school students.

Table 7. Pretest and Posttest Scores of Questionnaire and Cognitive Test Results					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PRETEST	148,11	92	10,281	1,072
	POSTTEST	164,52	92	8,600	,897
Pair 2	PRE_WK	66,30	92	9,135	,952
	POST_WK	80,43	92	5,379	,561

DISCUSSION

The results of the Paired Sample T-Test indicate a significant difference between the pretest scores of the national awareness questionnaire and cognitive test—administered before the intervention—and the posttest scores obtained after the implementation of the PjCAR model. According,⁽²⁷⁾ national awareness can be understood in two dimensions: moral and intellectual. The moral dimension relates to attitudes and actions, whereas the intellectual dimension pertains to knowledge about various national potentials, challenges, and opportunities.

The descriptive analysis of the pretest and posttest mean scores for both the questionnaire and cognitive test in the Pancasila Education subject at the elementary school level also showed an increase, as presented in table 5. This data processing result indicates an improvement in students' national awareness after the

implementation of the PjCAR model. The Project Citizen model is a learning approach that not only enables students to understand scientific concepts and principles but also enhances their ability to collaborate, innovate, think critically, and engage in real-world learning activities.⁽²⁸⁾ The primary goal of the Project Citizen model is to motivate and empower students to exercise their rights and responsibilities as democratic citizens through intensive portfolio-based engagement with public policy issues in schools or communities.⁽²⁹⁾

Similar to findings from other studies, the use of the Project Citizen learning model, which is portfolio-based, has been proven effective in strengthening educators' social competencies and supporting the transition to Society 5.0.^(30,31,32,33,34) This model plays a crucial role in guiding teachers in designing structured learning activities, serving as a framework to ensure that the teaching process is effective, efficient, and impactful.

By implementing this model, students are encouraged to participate actively and creatively, applying the principles of Project Citizen while demonstrating real-life examples of fostering engagement with their communities. In line with this perspective,⁽³⁵⁾ emphasized that the Project Citizen model plays a significant role in increasing student interest in learning and reducing boredom, making it an effective approach for elementary school education. The portfolio-based Project Citizen model, aimed at enhancing educators' social competencies toward Society 5.0, has been identified as a viable alternative to traditional teaching methods, as it leads to higher student learning outcomes compared to conventional instructional approaches.^(36,37,38,39,40)

PjCAR introduces an innovative approach by integrating the Project Citizen framework with augmented reality (AR) technology. This integration allows students to visualize concepts of national awareness through AR, making the learning process more engaging and interactive. Consistent with,⁽⁴¹⁾ the benefits of technology utilization include increased attractiveness, interactivity, and ease of use. The application of augmented reality provides a more immersive learning experience by offering three-dimensional visualizations and real-world simulations.⁽⁴²⁾ AR technology enables students not only to cognitively comprehend the material but also to experience and internalize real-life scenarios.^(43,44)

The PjCAR model begins by presenting contextual problems through augmented reality media. Students then develop critical ideas, breaking down issues into broader components and discussing them independently or in groups through project-based activities.^(45,46) Similarly, subsequent phases provide structured guidance for both teachers and students, ensuring a clear progression toward achieving learning objectives. The phases of the PjCAR model, as outlined in its syntax, include:⁽¹⁾ identifying public policy issues within the community through augmented reality;⁽²⁾ selecting a specific issue as the focus of classroom study;⁽³⁾ gathering information on the chosen issue using augmented reality;⁽⁴⁾ developing a class portfolio;⁽⁵⁾ presenting the portfolio (showcase); and⁽⁶⁾ reflecting on the learning experiences gained throughout the process.

The projects presented through AR media depict various contextual cases that pose threats to the nation. The younger generation, with their limited understanding of national issues and religious moderation, is highly vulnerable to being influenced or infiltrated by ideologies that are inconsistent with Pancasila. The digital world, which is deeply intertwined with the lives of adolescents, serves as a primary target for radical ideologies seeking to shape their mindset, perspectives, and actions. Various cases, such as suicide bombings, ethnic and religious conflicts, intergroup disputes, terrorism, radicalism, and other anti-nationalist movements, illustrate these threats.⁽⁴⁷⁾

Therefore, it is crucial to promote and teach national awareness as a means of safeguarding and preserving national unity. National awareness influences how individuals or groups perceive and understand their identity as a nation and how they act in accordance with the national philosophy. Similarly,⁽⁴⁸⁾ emphasize that national awareness must be instilled in every Indonesian citizen to ensure its realization in daily life.

National awareness consists of three dimensions: national sentiment, national understanding, and national spirit. National sentiment refers to the love for Indonesia that fosters a sense of unity and cohesion.⁽⁴⁹⁾ National understanding relates to nationalism, which is reflected in adherence to Pancasila, the 1945 Constitution (UUD 1945), the Unitary State of the Republic of Indonesia (NKRI), and *Bhinneka Tunggal Ika*.⁽⁵⁰⁾ Meanwhile, national spirit is demonstrated through a strong sense of social responsibility, patriotism, and willingness to make sacrifices.⁽⁵¹⁾ Education curriculum, which is designed to equip students for competition in both societal and global contexts.

Pancasila Education is a learning program designed to cultivate citizens who think, act, develop, and interact intelligently. In line with,⁽⁵²⁾ studying Pancasila Education enables students to understand their rights and responsibilities as good citizens from an early age.

The use of the Project Citizen model in teaching serves as an effective strategy for enhancing national awareness.^(53,54,55,56) The implementation of the PjCAR model has been proven to influence students' national awareness positively. Similarly,⁽⁵⁷⁾ stated that the Project Citizen model increases student participation in citizenship education. Several other studies that have incorporated AR-based technology with national awareness content have also been found effective in improving students' understanding.^(16,58,59)

Research conducted by⁽⁶⁰⁾ further highlights that the Project Citizen model helps students develop civic skills and actively participate in community life. This model engages students in project-based learning, which

enhances motivation and involvement. It also enables students to comprehend political and social issues within their local communities, encouraging them to contribute to positive societal change.⁽⁶¹⁾ According to,⁽⁶²⁾ the implementation of the Project Citizen model significantly strengthens national identity among high school students. They also suggest that students using the Project Citizen model achieve significantly higher cognitive learning outcomes than those taught using conventional lecture-based methods.

According to⁽³⁵⁾ findings, the average student learning outcomes increased from 48,83 in Cycle I to 64,59 in Cycle II and further to 91,76 in Cycle III. These results indicate that the Project Citizen model enhances critical thinking skills and learning outcomes in citizenship education at the elementary school level. Additionally,⁽⁶³⁾ study on the validation of AR-based media with national awareness content related to national heroes obtained a feasibility score of 94,4 %, categorized as valid, with expert validation also confirming its validity. Student responses to the media showed that 83,3 % strongly agreed with its use, while 16,7 % agreed. Meanwhile, teacher responses indicated a 73,3 % approval rating, categorized as good.

Furthermore,⁽⁶⁴⁾'s study result yielded a significance value of $0,000 < 0,05$, demonstrating a significant relationship between citizenship education and the Project Citizen model. This finding suggests that the implementation of Project Citizen is well-suited for Pancasila Education. However, this study has several limitations. First, it was conducted with a small sample size and within a single grade level, limiting the generalizability of the results. Second, the instrument used to assess national awareness measured only initial and final outcomes, preventing a detailed analysis of the percentage improvements in each aspect—national understanding, national sentiment, and national spirit. Additionally, the study's findings may be limited in their generalization since it focused exclusively on students enrolled in Pancasila Education at the elementary school level.

CONCLUSIONS

The findings of this study indicate a significant difference between the pretest results of national awareness competence before treatment and the posttest results after implementing the PjCAR model. The success of this research is reflected in the increased average scores of the national awareness questionnaire and cognitive tests before and after applying the PjCAR model. Several recommendations are proposed for teachers should provide guidance to students on operating the AR application on their smartphones before the lesson begins. For future research, incorporating a wider variety of anti-nationalism case images in AR media and assessing the application of PjCAR based on additional parameters could further explore the model's positive impact.

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