Development of the CIVIC-GO Application for Civic Education with Local Wisdom Content to Enhance Students' Critical Thinking

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Abstract
This study aims to develop the CIVIC-GO application based on a digital board game as a learning medium for Civic Education that integrates the local wisdom of Tulungagung, Indonesia to enhance students' critical thinking skills. The background of this research lies in the need for more interactive, contextual, and innovative Civic Education learning aligned with 21st-century demands, since conventional methods tend to be theoretical and less engaging. The research applied the ADDIE development model consisting of needs analysis, design of the application, prototype development, implementation through small and large group trials, and evaluation of the product. The subjects were eleventh-grade high school students in Tulungagung selected using a multistage cluster sampling technique. Data were collected through observation, interviews, questionnaires, and feasibility tests conducted by media experts, material experts, and students as users. The results showed that CIVIC-GO obtained a feasibility score of 91.5% from media experts, 96% from material experts, 88.8% from small group trials, and 89% from large group trials, with an average of 91.3% categorized as very feasible. These findings indicate that CIVIC-GO is not only effective in increasing students' motivation and engagement but also strengthens their understanding of Pancasila values through the integration of local cultural contexts. The implication of this study highlights that incorporating local wisdom into digital learning media can enrich the learning experience, foster students' cultural identity, and provide an innovative alternative for Civic Education in the digital era.

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1. Introduction

Civic Education has a strategic role in shaping students' character and critical awareness of social and cultural dynamics around them (Alawiyah;2024). Pancasila and Civic Education has the important goal of shaping a younger generation with character, critical thinking skills, and national awareness. However, in practice, Pancasila and Civic Education is often viewed as "theoretical," boring, and not very relevant to the local context for students. Furthermore, in the current digital era, students are more interested in learning methods that are interactive, visual, and technology based.

One of the main challenges is the lack of students' critical thinking skills regarding social and cultural issues in their environment. According to a survey conducted by the Tulungagung Regency Education Office in 2022, only 34% of high school students could connect local social issues with Pancasila values in Pancasila and Civic Education. This finding indicates the need to adjust learning materials to be more relevant to the local context, using more interactive and digital-based methods (Dispendik; 2022). This gap is particularly striking given the richness of Tulungagung's local wisdom, which can be regarded as an "intangible treasure" and a way of life imbued with moral, religious, communal, and ecological harmony.

Tulungagung's traditional performing arts, such as *tayub*, *tiban*, *reog kendang*, and *jaranan* not only serves as folk entertainment but also as a means of expressing identity and conveying moral messages (Hidayat; 2020). (1) *Tayub*: A traditional dance usually performed at celebrations or village events. The dancers, called *ledhek*, are accompanied by gamelan music and invite the audience to dance along. *Tayub* reflects the values of openness and brotherhood and serves as a medium for popular artistic expression, tolerance, multiculturalism, and respect for local identity. (2) *Tiban*: A sacred ritual dance performed during the dry season to pray for rain. The unique movements involve whipping each other's bodies with a *pecut* (whip) until blood appears. *Tiban* is full of symbolic meaning about struggle, sacrifice, and the agrarian community's hope for rain. (3) *Reog Kendang*: A

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unique art form from Tulungagung that differs from the Ponorogo *reog*. *Reog Kendang* emphasizes the energetic movements of the dancers, dominated by drum playing, symbolizing courage, strength, and togetherness.

Integrating such local wisdom into Pancasila and Civic Education is posited as an effective strategy to strengthen cultural identity while deepening students' grasp of national values (Nugraha et al., 2024). Leveraging interactive and visual digital media can further enhance engagement and foster critical thinking. In this regard, professional teacher communities such as the Subject Teacher Association and the Subject Teacher Forum hold substantial potential to co-design and disseminate innovative learning media that are technologically responsive and value-laden with local and national meanings.

Prior work in educational technology emphasizes that media design should move beyond general, text-centric materials and isolated question enrichment toward multimodal, context-aware learning experiences (Smaldino et al., 2008). Building on these insights, we conceptualize the CIVIC-GO application as a digital learning environment that operationalizes Learning Object Materials (LOM) including videos, animations, infographics, and game-based descriptive tasks to guide students in identifying problems, planning solutions, and submitting responses with structured feedback. The pedagogical backbone is Problem-Based Learning (PBL), aligned with students' levels of understanding of Tulungagung's local wisdom and supported by continuous formative evaluation to track and strengthen critical civic reasoning.

Despite this promise, several gaps remain. First, many existing Pancasila and Civic Education media remain generic and text-heavy, with limited, explicit integration of Tulungagung's local wisdom as the basis for problem scenarios and cultural artifacts (Smaldino et al., 2008). Second, there is a paucity of implementations that combine civic-oriented PBL with interactive LOM delivered via a culturally grounded Android board-game format that adapts to individual learner needs. Third, rigorous evidence comparing such game-based, locally contextualized approaches with conventional (non-game-based) instruction particularly in improving students' critical thinking on local socio-cultural issues remains scarce. Finally, systematic documentation of Subject Teacher Association's role as a co-design, implementation, and dissemination partner is limited.

In response, this study proposes the development of CIVIC-GO, a digital educational game for Pancasila and Civic Education that integrates Tulungagung's local wisdom and employs PBL-driven LOM with ongoing formative assessment. The research addresses three questions: (1) How is the CIVIC-GO application designed and developed as a civic-education learning medium based on educational games that integrate Tulungagung's local wisdom through partnerships with the Civic Education Teachers Association? (2) How is CIVIC-GO implemented in secondary-school civic-education classrooms with the support and collaboration of Subject Teacher Association? (3) To what extent is CIVIC-GO effective in enhancing students' critical thinking about local socio-cultural issues compared with conventional (non-game-based) instruction?

2. Method

In the development of the CIVIC-GO application, a civic education digital board game based on PBL with local wisdom content to enhance students' critical thinking the research procedure adapts the ADDIE development model, which consists of five stages (Steven; 2000): (1) analysis; (2) design; (3) development; (4) implementation; and (5) evaluation. The steps of the ADDIE development model in this research, as presented in Figure 1.

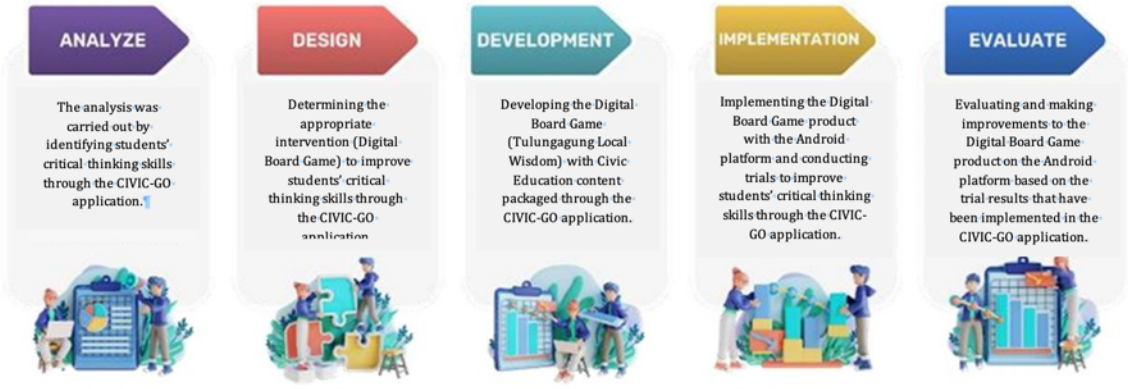

Figure 1. Development Steps of CIVIC-GO

The data source for this research consists of respondents who are 11th-grade students from senior high schools in Tulungagung Regency, East Java. The research sample was drawn using a multistage cluster sampling technique, as the researcher could not easily identify the population or because the population was very large. The following are the stages the researcher used to determine the research sample: (1) in the first stage, the

researcher selected the population and divided it into districts or fractions as a basis for drawing the initial regional sample; (2) in the second stage, the regional sample was re-divided into smaller fractions until the desired sample unit was reached; and (3) in the third stage, the researcher narrowed down the research subjects to be used for the main field trial. The data collection techniques and instruments used in this study served as the basis for determining the effectiveness, efficiency, and/or appeal of the product. The data in this study is qualitative, collected through interviews, observations, documentation studies, a critical appraisal checklist questionnaire, a field needs questionnaire, and a Delphi questionnaire.

The research utilized a multistage cluster sampling technique because the population was either difficult to identify or very large (Garcia; 2019). This approach and the data collection instruments were used to determine the effectiveness, efficiency, and/or appeal of the resulting product. The study collected both qualitative and quantitative data. The qualitative data was gathered through interviews, observations, documentation studies, a critical appraisal checklist questionnaire, a field needs questionnaire, and a Delphi questionnaire. This data was then analyzed using a descriptive qualitative approach with three main stages (Miles; 2004): data condensation, data display, and conclusion drawing/verification. SOAR analysis (Cole; 2013) was also used to focus on the positive aspects of the program. The quantitative data, which served as the second type of data in this research, was collected from the results of a psychological learning ability test and a civic education ability test with local wisdom content adapted from PISA (Geraldine; 2022). This quantitative data was subsequently analyzed using descriptive statistics and the Wilcoxon test with the help of SPSS 23.0.

3. Results and Discussion

The development of the CIVIC-GO application is more than just an innovation for enhancing students' critical thinking in Civic Education; it also reflects a shared commitment from both university lecturers and the Department of Education. This project aims to cultivate a generation that understands civic education while simultaneously preserving local culture using relevant technology to meet future challenges. The development process for the CIVIC-GO application involves literature analysis, a deep understanding of the subject, and case studies on implementing culture within the context of civic education. These stages provide a strong foundation for a research plan that covers the design and implementation of the application. The plan includes: (1) a needs analysis covering learning conditions, curriculum, and technology; (2) the formation of a project team; (3) the development of content, materials, and the application itself; (4) implementation; and (5) the determination of relevant evaluation methods for assessing the project's initial state, process, and final outcomes to improve civic literacy. The research will then analyze data to identify factors that influence the application's implementation success and culminate in a final report containing findings and recommendations for further development. Additionally, disseminating the research results through seminars and journal publications is an important part of the process to ensure the study contributes to efforts to improve civic literacy.

Based on the ADDIE development model procedure, as previously explained, here are the details of the analysis and design stages for the CIVIC-GO application, a civic education digital board game with local wisdom content designed to enhance students' critical thinking. In the Analysis stage, the researcher used observation and interview methods at senior high school at Kedungwaru and senior high school at Boyolangu. Observations were conducted during the learning process for 11th-grade students, as well as during student breaks and before teachers entered the classroom. Interviews were conducted with the Civic Education teachers who taught the 11th-grade class. In the second stage, Design, the objective was to create an Android application system that could serve as a digital board game learning medium for civic education with local wisdom content. The results of this stage are presented in Figure 2, which shows the application's flowchart a diagram that illustrates the steps and decisions of the development process.

Based on the application flowchart in Figure 2, a storyboard was then developed as a prototype for the development of the CIVIC-GO application a Civic Education digital board game based on PBL and containing local wisdom, designed to enhance students' critical thinking, as shown in Figure 3.

Figure 2. Flowchart Application CIVIC-GO

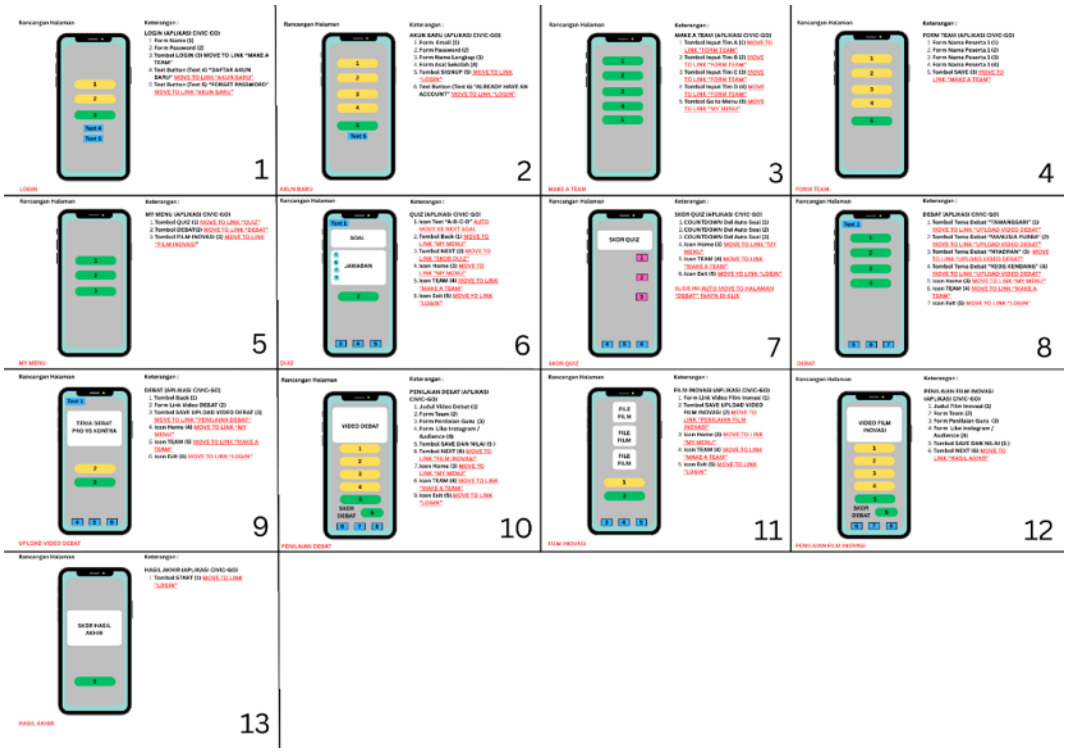

Figure 3. Storyboard of the CIVIC-GO Application

Based on the storyboard, the CIVIC-GO application prototype was developed with five main menu options. These include Core Competencies, Basic Competencies, and Objectives, which provides curriculum-based information specific to two partner public senior high schools in Indonesia (hereafter School A and School B). It also has a Materials menu for studying various topics on Civic Education, Civic Literacy, PBL, and local wisdom, with content sourced from both textbooks and the internet. Additionally, there is an Evaluation menu to measure student learning outcomes, a How-to-Use menu for learning how to navigate the app, and an About menu with information on the developers.

The development of this civic education digital board game, which contains local wisdom content to enhance students' critical thinking, was created using Construct 2. The results of this development stage are shown in Figure 4.

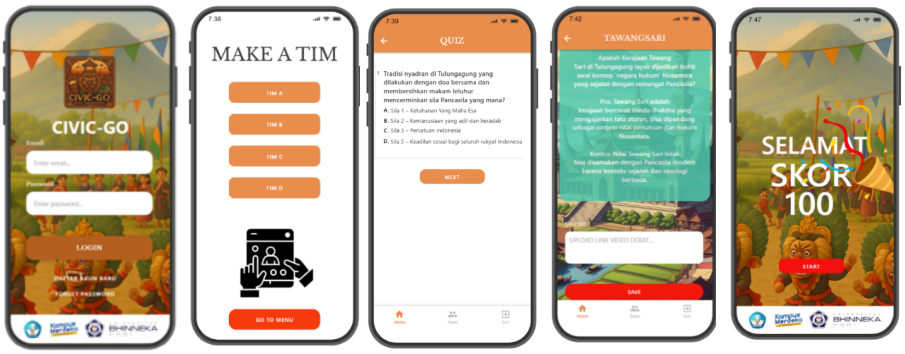

Figure 4. The CIVIC-GO Application Display

Furthermore, the media expert feasibility test for the development of the CIVIC-GO application a Civic Education Digital Board Game with local wisdom content to enhance students' critical thinking was conducted by a media expert. The results of this feasibility test can be seen in Table 1.

Table 1. Media Expert Feasibility Test Results

No	Aspect	Description	Score	Description
1	Functionality	Performs the required functions	5	Very Feasible
		As expected / Meets expectations	5	Very Feasible
		Compatible with the Android system	4	Feasible
		Security	5	Very Feasible
2	Reliability	Compatible with hardware	4	Feasible
		Performance against hardware and software errors	5	Very Feasible
		Recovery in case of errors	5	Very Feasible
3	Usability	Ease of use of the application	5	Very Feasible
		Ease of learning the application	5	Very Feasible
		Ease of use on Android	5	Very Feasible
		Interface quality	5	Very Feasible
4	Efficiency	Response speed between menus	5	Very Feasible
		Efficiency in resource usage	4	Feasible
5	Portability	Successful installation on multiple Android smartphones	5	Very Feasible
		Ease of installing the application	5	Very Feasible
Total Score			72	

Based on the percentage calculation of the feasibility test, the result is 91.5%. Based on Table 1, the CIVIC-GO application is in the "Very Feasible" category to be implemented at to two partner public senior high schools in Indonesia (hereafter Senior High School A and Senior High School B). The suggestions from media experts are as follows: (1) The developer needs to add material visualization. (2) The developer needs to add feedback after the evaluation as motivation for students' mastery of the material. The material expert feasibility test was conducted with Civic Education subject teachers at Senior High School A and Senior High School B. The results can be seen in Table 2.

Table 2. Material Expert Feasibility Test Results

No	Aspect	Description	Score	Description
1	Functionality	Performs the required functions	5	Very Feasible
		As expected / Meets expectations	5	Very Feasible
		Compatible with the Android system	4	Feasible
		Security	5	Very Feasible
2	Reliability	Compatible with hardware	4	Feasible
		Performance against hardware and software errors	5	Very Feasible
		Recovery in case of errors	5	Very Feasible
3	Usability	Ease of use of the application	5	Very Feasible
		Ease of learning the application	5	Very Feasible
		Ease of use on Android	5	Very Feasible
		Interface quality	5	Very Feasible
4	Efficiency	Response speed between menus	5	Very Feasible
		Efficiency in resource usage	4	Feasible
5	Portability	Successful installation on multiple Android smartphones	5	Very Feasible
		Ease of installing the application	5	Very Feasible
Total Score			72	

Based on the Table 2, the score obtained from the material expert feasibility test is 72, or a total percentage of 96% out of a maximum score of 75. Based on Table 2, the CIVIC-GO application is in the "Very Feasible"

category to be implemented at Senior High School A and Senior High School B. The material experts suggested that the developer needs to add animated images or videos based on gamification to support the material. This is so that students do not get bored quickly when studying the material in the application. The small group trial was conducted by giving questionnaires to 5 random students, all of whom were eleventh-grade students at Senior High School A and Senior High School B. The results can be seen in Table 3.

Table 3. Small Group Trial Results

No	Aspect	Description	Score	Description	No
1	Functionality	Performs the required functions	22	88%	Very Feasible
		As expected / Meets expectations	22	88%	Very Feasible
		Compatible with the Android system	21	84%	Very Feasible
		Security	24	96%	Very Feasible
2	Reliability	Compatible with hardware	22	88%	Very Feasible
		Performance against hardware and software errors	23	92%	Very Feasible
		Recovery in case of errors	24	96%	Very Feasible
3	Usability	Ease of use of the application	23	92%	Very Feasible
		Ease of learning the application	22	88%	Very Feasible
		Ease of use on Android	22	88%	Very Feasible
		Interface quality	20	80%	Very Feasible
4	Efficiency	Response speed between menus	22	88%	Very Feasible
		Efficiency in resource usage	20	80%	Very Feasible
5	Portability	Successful installation on multiple Android smartphones	22	88%	Very Feasible
		Ease of installing the application	24	96%	Very Feasible
Total Score			333		

Based on the Table 3, the score obtained from the small group trial is 333, or a total percentage of 88.8% out of a maximum score of 375. In the large group trial, a sample of 30 students was taken, 15 from senior high school A and 15 from senior high school B. The results can be seen in Table 4.

Table 4. Large Group Trial Results

No	Aspect	Description	Score	Percentage	Description
1	Functionality	Performs the required functions	132	88%	Very Feasible
		As expected / Meets expectations	131	87.3%	Very Feasible
		Compatible with the Android system	134	89.3%	Very Feasible
		Security	140	93.3%	Very Feasible
2	Reliability	Compatible with hardware	131	873%	Very Feasible
		Performance against hardware and software errors	131	87.3%	Very Feasible
		Recovery in case of errors	130	86.7%	Very Feasible
3	Usability	Ease of use of the application	136	90.7%	Very Feasible
		Ease of learning the application	137	91.3%	Very Feasible
		Ease of use on Android	138	92%	Very Feasible
		Interface quality	129	86%	Very Feasible
4	Efficiency	Response speed between menus	131	87.3%	Very Feasible
		Efficiency in resource usage	129	86%	Very Feasible
5	Portability	Successful installation on multiple Android smartphones	137	91.3%	Very Feasible
		Ease of installing the application	136	90.7%	Very Feasible
Total Score			2002		

Based on the Table 4, the score obtained from the large group trial is 2002, or a total percentage of 89% out of a maximum score of 2250. Product evaluation is an analysis of the developed product based on the data obtained from the product trial activities. From these trials, there may be input from respondents for product refinement. Product revision is the stage of perfecting the product so that the final result of the product development becomes better. Here is the final data from the trial stages, including the media expert feasibility test, material expert feasibility test, small group trial, and large group trial. The data can be seen in Table 5.

Table 5. Trial Test Data

Aspect	Score	Maximal Score	Percentage	Description
Media expert feasibility test	87	95	91.5 %	Very Feasible
Material expert feasibility test	72	75	96%	Very Feasible
Small group trial	333	375	88.8%	Very Feasible
Large group trial	2002	2250	89%	Very Feasible
Average			91.3%	Very Feasible

The success indicator of the program is that the developed CIVIC-GO application has a feasibility score of > 85% and is able to improve students' critical thinking skills, especially at the high school level. The research results show that the development of the CIVIC-GO application based on a digital board game using the ADDIE

model is able to address the challenges of Civic Education learning, which has been considered theoretical and lacking context. This is reinforced by the on-the-ground conditions, which indicate a low ability of students to connect local socio-cultural issues with Pancasila values. Through the design stage, the application was designed with five main menus that present core competencies, materials, evaluation, usage instructions, and a developer profile. This design ensures that the application not only functions as a learning resource but also as a means of exploring local culture that can strengthen students' identity. In the development stage, the application, created with Construct 2, was tested for feasibility by media and material experts, with results of 91.5% and 96%, respectively, both falling into the "very feasible" category. These findings confirm that the application meets both technical and content learning standards. Suggestions from the experts, such as the addition of gamified visualizations and animations, also indicate opportunities for further development to make the application even more engaging.

The implementation stage through small and large group trials yielded consistent results of 88.8% and 89%, respectively, in the "very feasible" category. This indicates that the application is well-received by students and can increase their motivation and engagement in the learning process. In the evaluation stage, the overall average score of 91.3% shows that the CIVIC-GO application has a very high level of feasibility.

At the evaluation stage, the overall average score of 91.3% indicates that the CIVIC-GO application has a very high level of feasibility. Furthermore, the application is not only effective as a learning medium but has also successfully enhanced students' critical thinking skills regarding local socio-cultural issues. The integration of local wisdom in digital learning has proven to provide added value, as students do not merely understand the material cognitively but also internalize Pancasila values through contextual and engaging learning experiences. Thus, this study confirms that innovative learning media combining technology, gamification, and local wisdom can serve as a strategic solution to improve the quality of civic education in the digital era.

However, this study has several limitations. First, the trial implementation of the CIVIC-GO application was limited to a few schools in the Tulungagung area, so generalizing the results to other regions with different socio-cultural characteristics should be done cautiously. Second, the application's features are still focused on cognitive and affective aspects, while the psychomotor dimension of civic education has not been fully developed. Third, the evaluation of the application's effectiveness was conducted over a relatively short period, so it does not yet fully reflect the long-term impact on students' civic behavior and attitudes. Therefore, further research is recommended to involve more schools and regions with diverse cultural backgrounds, as well as to develop a more interactive and sustainable version of the application. In addition, it is important to integrate authentic assessment features that can more comprehensively evaluate students' critical thinking skills and civic character.

4. Conclusion

Based on the research and development conducted with the ADDIE model, it can be concluded that the CIVIC-GO application, a digital board game with local Tulungagung wisdom content, is suitable for use as a learning medium for Pancasila and Civic Education at the high school level. The feasibility test results show that this application obtained a very high percentage: 91.5% from media experts, 96% from material experts, 88.8% from the small group trial, and 89% from the large group trial, with an average feasibility of 91.3% which is in the "very feasible" category. This high score proves that the application is capable of increasing students' learning motivation, providing a more interactive learning experience, and supporting the development of students' critical thinking skills regarding social and cultural issues in their environment. Moreover, the integration of local wisdom into this application not only strengthens the learning context but also fosters students' pride in their regional cultural identity. Thus, the CIVIC-GO application can be an innovative alternative in Pancasila and Civic Education learning as well as a means of preserving local cultural values that are relevant to the demands of 21st-century education.

Author Contributions

All authors have equal contributions to the paper. All the authors have read and approved the final manuscript.

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Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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