

## Design and Evaluation of ADDIE-Based Animated Video Instructional Materials for Enhancing Learning Outcomes in Primary Civic Education

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**Abstract:** Materials to enhance learning outcomes in primary civic education. The research employed a Research and Development (R&D) approach using the ADDIE model, which consists of analysis, design, development, implementation, and evaluation stages. The study was conducted with second-grade students at SDN 01 Terara, involving a small group (n=6) and a large group (n=20). Data were collected through expert validation, questionnaires, and pretest–posttest assessments. The validation results showed that the instructional materials achieved an average score of 71%, categorized as valid. The practicality test indicated positive responses from teachers (70%) and students (70.1%), categorized as highly practical. The effectiveness analysis using the N-gain score revealed a moderate improvement in the small group (0.48) and a high improvement in the large group (0.58). These findings indicate that the developed animated video-based instructional materials are valid, practical, and effective in improving students' learning outcomes. This study contributes to the field of educational technology by integrating multimedia learning with a systematic instructional design framework and providing empirical evidence of its effectiveness in primary civic education.

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### Introduction

The rapid advancement of digital technology has significantly transformed educational practices across the globe, particularly in primary education (Bond et al., 2020; Voogt & Roblin, 2012). In the era of the Fourth Industrial Revolution, the integration of technology into teaching and learning processes is no longer optional but has become a fundamental requirement to equip students with essential 21st-century skills (OECD, 2019; Redecker, 2017). However, in many primary school contexts, learning practices still rely heavily on conventional teaching methods, such as textbooks and teacher-centered instruction, which often fail to engage students effectively and result in low learning outcomes (Hattie, 2009; Schindler et al., 2017).

One of the major challenges in primary education is how to design learning experiences that are engaging and meaningful for students. Young learners tend to exhibit diverse learning

styles, with a strong preference for visual and kinesthetic modalities (Fleming & Mills, 1992; Gilakjani, 2012). Traditional instructional materials are often insufficient in addressing these diverse needs, leading to reduced motivation and limited understanding of subject matter. This issue becomes more critical in subjects that involve abstract concepts, such as civic education, where students are required to understand values, norms, and principles of citizenship (Nucci & Narvaez, 2008; Banks, 2008).

In response to these challenges, the integration of multimedia-based instructional materials has been widely recognized as an effective strategy to enhance student engagement and learning outcomes (Mayer, 2009; Moreno & Mayer, 2007). According to Mayer's Cognitive Theory of Multimedia Learning, students learn more effectively when information is presented through both visual and auditory channels rather than a single modality (Mayer, 2014). This dual-channel processing enables learners to construct deeper understanding and improve knowledge retention.

Among various forms of multimedia, animated video has emerged as a powerful instructional medium in primary education. Animated videos can visualize abstract concepts, illustrate dynamic processes, and simulate real-life situations, making learning more concrete and meaningful (Betrancourt, 2005; Höffler & Leutner, 2007). Research has shown that animation-based learning can significantly improve students' motivation and conceptual understanding (Schneider et al., 2018; van der Meij & van der Meij, 2013). Furthermore, animated videos allow learners to control the pace of learning, supporting self-regulated learning and individualized instruction (Zhang et al., 2006).

Despite these advantages, the use of animated video in classrooms is often limited to supplementary media rather than being developed as structured instructional materials. Many teachers still face challenges in designing and implementing effective multimedia-based learning resources (Koehler & Mishra, 2009; Tondeur et al., 2017). In addition, previous studies tend to focus on the effectiveness of animated videos without integrating them into a systematic instructional design framework, which is essential to ensure alignment between learning objectives, instructional strategies, and assessment methods.

To address this limitation, instructional design models play a crucial role in guiding the development of effective teaching materials. One of the most widely used models is the ADDIE model, which consists of five stages: analysis, design, development, implementation, and evaluation (Branch, 2009; Molenda, 2015). The ADDIE model provides a systematic approach to developing instructional materials that are aligned with learners' needs and learning objectives. Studies have shown that learning materials developed using the ADDIE model tend to be more structured, valid, and effective (Peterson, 2003; Aldoobie, 2015).

In the context of primary civic education, the need for innovative instructional materials is particularly important. Civic education involves abstract concepts such as values, norms, and citizenship, which are often difficult for young learners to understand (Banks, 2008). Without appropriate instructional media, students may struggle to comprehend the material, resulting in low engagement and learning outcomes. Therefore, integrating animated video into civic education through a systematic design approach has the potential to make learning more engaging, meaningful, and effective.

However, there is still limited research that specifically examines the development and evaluation of animated video-based instructional materials in primary civic education using a structured instructional design model such as ADDIE. Most existing studies focus on general multimedia learning or different subject areas without addressing the unique characteristics of civic education. This gap highlights the need for further research that integrates multimedia learning theory with systematic instructional design.

Based on these considerations, this study aims to design and evaluate ADDIE-based animated video instructional materials to enhance learning outcomes in primary civic education. This study contributes to the field of educational technology by providing a systematic development approach and empirical evidence on the effectiveness of animated video-based instructional materials in improving students' learning outcomes.

### **Research Method**

This study employed a Research and Development (R&D) approach to design, develop, and evaluate animated video-based instructional materials for primary civic education. The development process followed the ADDIE instructional design model, which consists of five systematic stages: analysis, design, development, implementation, and evaluation (Branch, 2009; Molenda, 2015). This model was selected due to its structured and iterative nature, ensuring that the developed instructional materials are aligned with learners' needs and instructional objectives.

The research was conducted at SDN 01 Terara, involving second-grade elementary school students. The participants consisted of two groups: a small group trial involving six students and a large group trial involving twenty students. The selection of participants was based on purposive sampling, considering their relevance to the research objectives and accessibility within the study context.

In the analysis stage, a needs assessment was conducted through interviews with teachers and observations of classroom practices. This stage aimed to identify existing problems in teaching and learning processes, students' characteristics, and the availability of technological resources. The findings indicated that learning activities were predominantly teacher-centered, and instructional media were limited, resulting in low student engagement and learning outcomes.

In the design stage, the structure and content of the animated video-based instructional materials were planned. This included the formulation of learning objectives, content sequencing, storyboard development, and the design of evaluation instruments. The instructional materials were aligned with the primary civic education curriculum, particularly focusing on Pancasila values.

The development stage involved the production of animated video instructional materials using digital tools. The developed product included visual animations, narration, and interactive elements designed to enhance students' understanding. The product was then validated by three experts: a content expert, a language expert, and a technology expert. The validation process aimed to assess the quality of the instructional materials in terms of content accuracy, language clarity, and media design.

In the implementation stage, the developed instructional materials were tested in real classroom settings. The trial was conducted in two phases: a small group trial to identify initial weaknesses and a large group trial to evaluate the overall effectiveness of the product. During this stage, students participated in learning activities using the animated video materials, and data were collected through observation and questionnaires.

The evaluation stage was conducted to assess the validity, practicality, and effectiveness of the developed instructional materials. Validity was determined based on expert validation results using percentage scores. Practicality was measured through teacher and student responses using a Likert-scale questionnaire. Effectiveness was evaluated by comparing students' learning outcomes before and after the implementation using pretest and posttest scores.

The effectiveness of the instructional materials was analyzed using the normalized gain (N-gain) formula:

The N-gain score was categorized into three levels: high ( $g > 0.7$ ), medium ( $0.3 \leq g \leq 0.7$ ), and low ( $g < 0.3$ ). This analysis was used to determine the extent to which the animated video-based instructional materials improved students' learning outcomes.

All data were analyzed using descriptive quantitative methods. The results were presented in the form of percentages, mean scores, and gain values to provide a comprehensive evaluation of the developed product. Through this systematic process, the study aimed to ensure that the instructional materials were valid, practical, and effective for use in primary civic education.

## Result

### 1. Expert Validation Results

The validity of the developed animated video-based instructional materials was assessed by three experts: content, language, and technology experts. The results are presented in Table 1.

**Table 1.** Expert Validation Results

Validator	Score (%)	Category
Content Expert	69%	Valid
Language Expert	73%	Valid
Technology Expert	71%	Valid
<b>Average</b>	<b>71%</b>	<b>Valid</b>

Table 1 shows that the developed instructional materials achieved an average validation score of 71%, which falls into the "valid" category. Among the three aspects, the highest score was obtained from the language expert (73%), indicating that the clarity and readability of the instructional materials were well-developed. Meanwhile, the content and technology aspects also achieved satisfactory scores, suggesting that the materials are appropriate in terms of subject matter accuracy and media design. These results indicate that the product is suitable for implementation with minor revisions.

## 2. Practicality Test Results

The practicality of the instructional materials was evaluated based on responses from teachers and students after implementation.

**Table 2.** Practicality Test Results

Respondent	Score (%)	Category
Teacher	70%	Highly Practical
Students	70.1%	Highly Practical
<b>Average</b>	<b>70.05%</b>	<b>Highly Practical</b>

As presented in Table 2, the average practicality score was 70.05%, which is categorized as “highly practical.” The results indicate that both teachers and students perceived the instructional materials as easy to use, engaging, and suitable for classroom application. The slightly higher score from students suggests that the animated video format successfully captured their interest and facilitated active participation in learning activities.

## 3. Effectiveness Test Results

The effectiveness of the instructional materials was analyzed using pretest and posttest scores, which were further calculated using the normalized gain (N-gain).

**Table 3.** Small Group Trial Results

Indicator	Score
Pretest Mean	57.71
Posttest Mean	78.14
N-gain Score	0.48
Category	Moderate

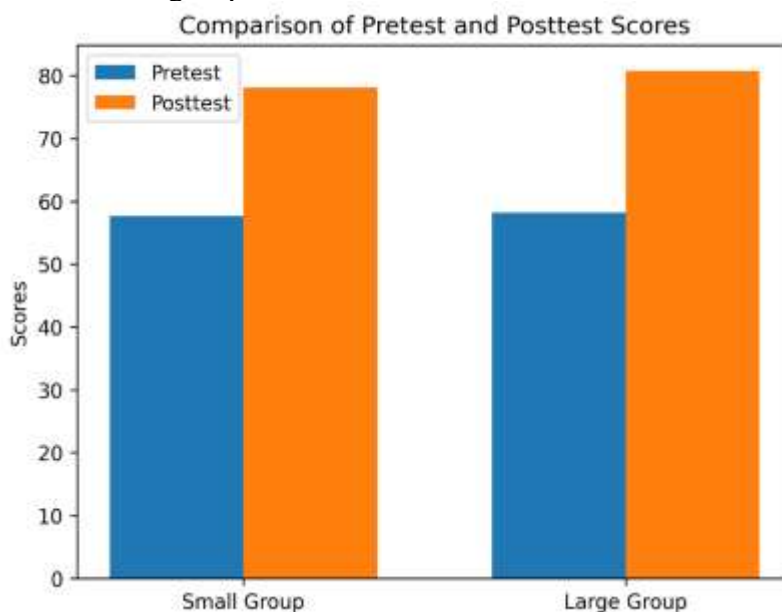
The results of the small group trial show that the average pretest score increased from 57.71 to 78.14 in the posttest. The calculated N-gain score of 0.48 indicates a moderate level of improvement in students’ learning outcomes. This suggests that the instructional materials had a positive impact on student learning, although further optimization may still be needed.

**Table 4.** Large Group Trial Results

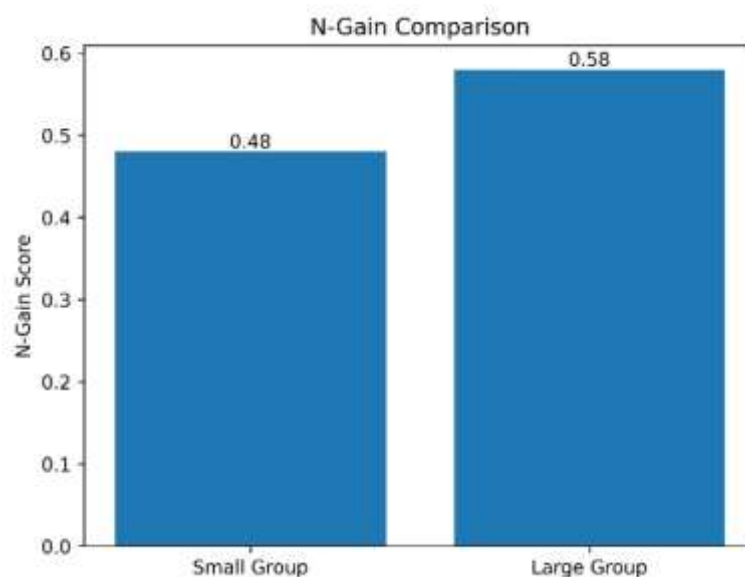
Indicator	Score
Pretest Mean	58.25
Posttest Mean	80.80
N-gain Score	0.58
Category	High

In the large group trial, the average pretest score increased from 58.25 to 80.80 in the posttest. The N-gain score of 0.58 falls into the “high” category, indicating a significant improvement in students’ learning outcomes. Compared to the small group trial, the results suggest that the instructional materials performed more effectively when implemented in a larger classroom setting.

#### 4. Visualization of Learning Improvement



**Figure 1.** Comparison of Pretest and Posttest Scores in Small and Large Groups  
 The figure presents a side-by-side comparison of pretest and posttest scores for both small and large group trials. The results show a consistent increase in students' scores after the implementation of the animated video-based instructional materials. In the small group, the average score improved from 57.71 to 78.14, while in the large group, it increased from 58.25 to 80.80. The greater improvement observed in the large group suggests that the instructional materials demonstrate higher effectiveness when applied in a broader classroom context.



**Figure 2.** N-Gain Comparison between Small and Large Groups

The figure presents the comparison of N-gain scores between the small group and large group trials. The small group achieved an N-gain score of 0.48 (moderate category), while the large group achieved a higher N-gain score of 0.58 (high category). The results indicate that the animated video-based instructional materials demonstrated greater effectiveness when implemented in a larger classroom setting.

## 5. Summary of Results

**Table 5.** Summary of Product Quality

Aspect	Indicator Value	Category
Validity	71%	Valid
Practicality	70.05%	Highly Practical
Effectiveness	0.58	High

Table 5 presents the overall quality of the developed animated video-based instructional materials based on three main evaluation criteria: validity, practicality, and effectiveness. The validity aspect achieved a score of 71%, indicating that the instructional materials meet the required standards in terms of content, language, and media design. The practicality aspect obtained an average score of 70.05%, categorized as highly practical, suggesting that the materials are easy to use and well-received by both teachers and students.

In terms of effectiveness, the N-gain score of 0.58 falls into the high category, indicating that the instructional materials significantly improve students' learning outcomes. Overall, these results confirm that the developed instructional materials are of high quality and suitable for implementation in primary civic education.

## Discussion

This study aimed to design and evaluate ADDIE-based animated video instructional materials to enhance learning outcomes in primary civic education. The findings demonstrate that the developed instructional materials meet the criteria of validity, practicality, and effectiveness. These results provide important insights into the role of multimedia-integrated instructional design in improving the quality of teaching and learning in primary education.

First, the validity results indicate that the instructional materials are appropriate in terms of content, language, and media design, as reflected in the average validation score of 71%. This finding suggests that the integration of animated video elements has been aligned with curriculum standards and learning objectives. From an instructional design perspective, validity is a crucial aspect that ensures the accuracy and relevance of learning materials (Branch, 2009). The involvement of multiple experts in this study strengthens the credibility of the product and confirms that the materials meet academic and pedagogical standards.

The positive validation results can also be interpreted through the lens of multimedia learning theory. According to Mayer (2014), effective multimedia design should follow principles such as coherence, signaling, and modality to optimize cognitive processing. The animated video materials developed in this study appear to have successfully applied these principles, as evidenced by the expert evaluations. This indicates that well-designed multimedia content can support learners in constructing meaningful knowledge.

Second, the practicality findings reveal that the instructional materials are highly feasible for classroom use, with an average score of 70.05% from teachers and students. This suggests that the materials are user-friendly, engaging, and easy to integrate into the teaching process. The high practicality level is particularly significant in primary education, where teachers often face challenges in adopting new technologies due to limited time and technical expertise.

The positive responses from students indicate that the animated videos successfully captured their attention and increased their engagement during learning activities. This aligns with previous research highlighting that multimedia-based learning environments can enhance student motivation and participation (Schindler et al., 2017). In addition, the use of animated video supports a more student-centered learning approach, allowing learners to actively interact with the content rather than passively receiving information.

Third, the effectiveness results show a significant improvement in students' learning outcomes, as indicated by the N-gain scores. The small group trial achieved an N-gain score of 0.48 (moderate), while the large group trial reached 0.58 (high). These findings demonstrate that the instructional materials have a positive impact on students' cognitive achievement.

The improvement in learning outcomes can be explained by the dual-channel processing mechanism proposed in multimedia learning theory (Mayer, 2009). Animated videos combine visual and auditory information, which helps reduce cognitive load and enhances comprehension. This is particularly important in civic education, where many concepts are abstract and require visualization to be fully understood by young learners.

Furthermore, the higher N-gain score observed in the large group trial suggests that the instructional materials are effective in real classroom settings. This indicates that the product is scalable and can be implemented in broader educational contexts. The results are consistent with previous studies that report significant improvements in learning outcomes through multimedia-based instruction (Zhang et al., 2006; Schneider et al., 2018).

However, despite the positive findings, the N-gain scores indicate moderate to high improvement rather than very high improvement. This suggests that while the instructional materials are effective, there is still room for improvement. Several factors may influence the results, including students' prior knowledge, learning environment, and teacher facilitation during implementation. Therefore, future studies should consider incorporating additional instructional strategies or combining animated video with other interactive learning approaches to further enhance learning outcomes.

This study also highlights the importance of using a systematic instructional design model such as ADDIE in developing educational materials. The structured stages of analysis, design, development, implementation, and evaluation ensure that the product is not only theoretically sound but also practically applicable. Unlike previous studies that focus solely on the effectiveness of media, this research provides a comprehensive approach by integrating development, validation, and evaluation processes.

In terms of practical implications, the findings suggest that teachers can adopt animated video-based instructional materials as an effective alternative to traditional teaching methods. These materials can help create more engaging and interactive learning environments, particularly in subjects that involve abstract concepts such as civic education. In addition, the

use of the ADDIE model can guide teachers and instructional designers in developing high-quality learning materials that meet educational standards.

Nevertheless, this study has several limitations. The sample size was relatively small and limited to a single school, which may affect the generalizability of the findings. In addition, the study relied primarily on descriptive quantitative analysis without incorporating inferential statistical tests. Future research is recommended to involve larger and more diverse samples, as well as to apply experimental designs and statistical analyses to strengthen the evidence of effectiveness.

Overall, the findings of this study confirm that ADDIE-based animated video instructional materials are a valid, practical, and effective approach to improving learning outcomes in primary civic education. The integration of multimedia learning and systematic instructional design offers a promising direction for enhancing the quality of education in the digital era.

## **Conclusion**

This study aimed to design and evaluate ADDIE-based animated video instructional materials to enhance learning outcomes in primary civic education. The findings demonstrate that the developed instructional materials meet the criteria of validity, practicality, and effectiveness.

The validation results confirm that the instructional materials are appropriate in terms of content accuracy, language clarity, and media design. The practicality findings indicate that the materials are easy to use and well-received by both teachers and students, supporting their feasibility for classroom implementation. Furthermore, the effectiveness analysis shows a significant improvement in students' learning outcomes, as evidenced by the N-gain scores, with higher effectiveness observed in larger group settings.

These results highlight the importance of integrating multimedia learning with a systematic instructional design framework. The use of animated video within the ADDIE model provides a structured and engaging learning experience that supports students' understanding of abstract concepts in civic education. Therefore, the developed instructional materials can be considered a viable and innovative solution for improving learning outcomes in primary education.

Overall, this study contributes to the field of educational technology by providing empirical evidence on the effectiveness of animated video-based instructional materials and demonstrating the applicability of the ADDIE model in developing high-quality learning resources.

## **Recommendation**

Based on the findings of this study, several recommendations can be proposed. First, teachers are encouraged to utilize animated video-based instructional materials as an alternative to conventional teaching methods to create more engaging and interactive learning environments. The integration of multimedia elements can help students better understand abstract concepts and improve their learning outcomes.

Second, educational practitioners and curriculum developers are recommended to adopt systematic instructional design models, such as ADDIE, in developing teaching materials to ensure their quality, effectiveness, and alignment with learning objectives.

Third, future researchers are encouraged to expand this study by involving larger and more diverse samples to enhance the generalizability of the findings. In addition, further research could incorporate experimental designs and advanced statistical analyses to provide stronger evidence of effectiveness.

Finally, it is recommended to explore the integration of animated video with other interactive learning approaches, such as gamification or problem-based learning, to further enhance students' engagement and learning outcomes.

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