

DEVELOPMENT OF THE HOTS-BASED “PROK-PROK” GAME APPLICATION TO IMPROVE CRITICAL THINKING SKILLS AND SOCIAL STUDIES LEARNING ACHIEVEMENT OF FIFTH-GRADE STUDENTS AT SDN SUKOLILO 01

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Received: 15/06/2026 | Revised : 20/06/2026 | Accepted: 10/07/2026 | Published :03/08/2026

Abstract

The research aims to develop a HOTS-based “Prok-Prok” game application and test its feasibility, effectiveness, and practicality in improving critical thinking skills and social studies learning achievement results of class V SDN Sukolilo 01. The research uses the Research and development method with the ADDIE development model including the stages of analysis, design, development, implementation, and evaluation. Data collection techniques use questionnaires and tests (Pre-test and Post-test), while data analysis techniques use descriptive analysis and the Wilcoxon test. The results of the research are as follows: (1) a HOTS-based “Prok-Prok” game application learning media has been developed which contains the material of the Proclamation of Indonesian Independence to improve critical thinking skills and social studies learning achievement results of class V SDN SUKOLILO 0; (2) the developed learning media is declared valid with an average percentage score of 81.81% from the media aspect while 86.67% from the material expert; (3) the practicality aspect, the media obtained an average percentage score of 85%, which shows that the media is practical to use in the learning process; (4) effectiveness aspect, the results of the Wilcoxon test show the results of the Wicoxon test with an Asymp.Sig. (2-tailed) value of 0.001, which means that Ho is rejected and Ha is accepted. It can be concluded that the HOTS-based “Prok-Prok” game learning media is able to improve critical thinking skills and the learning achievement results of class V Social Studies at SDN Sukolilo 01

Keywords: Application Development, “Prok-Prok” Game, HOTS, Critical Thinking Skills, Social Studies Learning Achievement

INTRODUCTION

Education is an essential aspect of developing human potential in terms of knowledge, skills, and character building. However, the state of education in Indonesia still faces various issues, including low teacher quality, limited educational infrastructure, and the dominant use of traditional teaching methods, which result in low student interest in learning. Furthermore, rapid technological advancement brings both positive and negative impacts on students. On one hand, technology facilitates access to information; on the other hand, students tend to use technology more for playing games rather than for learning activities, leading to reduced social interaction and learning motivation.

Digital games can be utilized as a learning medium capable of increasing students' motivation and interest in learning. Technology-based learning media are considered suitable for the characteristics of modern learning because they offer a more engaging and interactive learning experience. Another issue relates to the utilization of learning media in schools. In practice, teachers rarely use learning media due to several constraints, such as costs, lack of knowledge and skills in media development, difficulties in creating learning media, and limited school facilities. Consequently, the learning process still takes place conventionally, leaving students with less meaningful learning experiences. In addition, teachers rarely apply Higher Order Thinking Skills (HOTS)-based questions. This condition is caused by the minimal training on HOTS, difficulty in creating questions aligned with students' abilities, and a lack of teacher understanding regarding the importance of developing higher-order thinking skills. In fact, HOTS questions are vital for training critical thinking abilities, problem-solving, decision-making, and student

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Ellenna Ayu Maywulandari et al

readiness to face 21st-century challenges. In Social Studies (IPS), the author explains that instruction is still dominated by the lecture method. Teachers more frequently explain the topic of the Proclamation of Indonesian Independence verbally with minimal use of learning media. This condition renders learning less attractive, decreases student motivation, leads to low student participation, and negatively impacts Social Studies learning achievement. These problems were confirmed through interview results conducted on May 8, 2025, at SDN Sukolilo 01. The interviews revealed that teachers rarely used learning media when teaching the topic of the Proclamation of Indonesian Independence and relied heavily on lecture methods. Teachers also expressed that the main obstacles in using media were practicality, efficiency, and cost.

The urgency of this study arises from learning conditions that are not yet capable of meeting the demands of 21st-century education. Learners require learning media that align with technological developments so that the learning process becomes more engaging, interactive, and capable of raising learning motivation. Additionally, technological advancements and the Industry 4.0 era require students to possess Higher Order Thinking Skills (HOTS). Therefore, Social Studies learning needs to be designed not only to focus on rote memorization, but also to develop students' skills in analysis, evaluation, creativity, and critical thinking.

Another point of urgency is the low utilization of digital learning media by teachers. This situation leads to students being less interested in participating in learning and results in sub-optimal achievement. Thus, innovative learning media that are practical, attractive, and suitable for elementary school students' characteristics are required. Observation results at SDN Sukolilo 01 further reinforce the urgency of this research, revealing that teachers still dominate instruction through lecture methods without making optimal use of digital media. This forms the basis for developing more innovative learning media.

Based on these issues, the author offers a solution by developing technology-based learning media in the form of an educational game application called "Prok-Prok". The "Prok-Prok" learning media is designed as an online game application containing material on the Proclamation of Indonesian Independence, learning videos, multiple-choice quizzes, picture quizzes, and HOTS-based essay questions. This application was developed with an attractive, colorful visual presentation tailored to the characteristics of elementary school students to boost their learning motivation.

The "Prok-Prok" game offers several question difficulty levels, ranging from easy to HOTS categories. Consequently, students with strong critical thinking skills will find it easier to complete the game and achieve high learning outcomes, whereas students with lower critical thinking skills will receive gradual practice to improve their abilities. Through the development of the "Prok-Prok" game application, the author hopes that this medium can serve as an innovative alternative for Social Studies learning, improve critical thinking skills, enhance learning achievement, and shift Social Studies from a teacher-centered approach into a more active, attractive, and technology-based environment. The final objective of the study, emphasized at the end of the background, is to improve students' critical thinking skills and Social Studies learning achievement on the topic of the Proclamation of Indonesian Independence.

LITERATURE REVIEW

Learning media are described as tools or intermediaries for delivering information so that the learning process becomes more effective, engaging, and capable of enhancing students' motivation to learn. Various expert opinions are cited to demonstrate that learning media play a vital role in improving the quality of education, particularly in the era of digital technology development.

Educational games serve as an innovative form of learning media. Based on various previous studies cited, educational games have proven effective in improving learning motivation, student activeness, involvement in learning, and providing a more enjoyable learning experience. This review also explains the characteristics, types, benefits, and advantages of educational games, providing a strong theoretical foundation for selecting the "Prok-Prok" game application as a Social Studies learning medium.

The literature review subsequently addresses Higher Order Thinking Skills (HOTS) as a core concept in this study. HOTS is presented as higher-level thinking abilities encompassing analysis, evaluation, problem-solving, critical thinking, formulating arguments, decisionmaking, and generating creative ideas. Various theories from experts are drawn upon to demonstrate that implementing HOTS in instruction is crucial for addressing the demands of 21st-century education.

Critical thinking, learning achievement results, and Social Sciences (IPS) are discussed as key variables and the broader context of this research. These theoretical reviews serve as the conceptual framework explaining how game-based learning media and HOTS are expected to enhance students' critical thinking skills and learning

DEVELOPMENT OF THE HOTS-BASED "PROK-PROK" GAME APPLICATION TO IMPROVE CRITICAL THINKING SKILLS AND SOCIAL STUDIES LEARNING ACHIEVEMENT OF FIFTH-GRADE STUDENTS AT SDN SUKOLILO 01

Ellenna Ayu Maywulandari et al

outcomes. However, in the provided document, detailed content for these three subsections does not appear because the document extraction stopped prior to those sections. The conceptual framework connects the use of the "Prok-Prok" game application, the implementation of HOTS, the enhancement of critical thinking skills, and the improvement of Social Studies learning outcomes. This framework links theory to the execution of the research. Additionally, the thesis presents the Novelty of Research (State of the Art), showing that this study offers a novel contribution through the development of a HOTSbased "Prok-Prok" game application on the topic of the Proclamation of Indonesian Independence for fifth-grade elementary students, setting it apart from previous studies.

METHOD

This study used the Research and Development (R&D) method with the ADDIE development model, consisting of five stages: Analysis, Design, Development, Implementation, and Evaluation. The analysis stage was conducted to identify learning needs, student characteristics, and issues occurring in Social Studies learning. The design stage was utilized to design the "Prok-Prok" game application, compile learning materials, craft HOTSbased questions, and design the media interface. Next, the development stage involved product creation and validation by experts. The implementation stage was carried out through trial testing with fifth-grade elementary students, while the evaluation stage aimed to determine the feasibility, practicality, and effectiveness of the developed media.

The research target was selected based on observations and interviews at SDN Sukolilo 01, Jiwan District, Madiun Regency, which indicated that Social Studies instruction was still dominated by lecture methods, digital learning media usage was not optimal, and students' critical thinking skills and learning outcomes needed improvement. Therefore, fifth-grade students were chosen as research subjects in alignment with the need to develop educational game-based learning media.

The learning content used in the research was the Event of the Proclamation of Indonesian Independence in the Social Studies subject. The developed product was an educational game application called "Prok-Prok," containing learning material, instructional videos, multiple-choice quizzes, picture quizzes, and Higher Order Thinking Skills (HOTS)-based essay questions. Various instruments were used during the research process, including expert validation sheets, teacher and student response questionnaires, observation sheets, interview guides, as well as pre-tests and post-tests to measure improvements in critical thinking skills and student learning outcomes.

The developed product was designed according to the characteristics of elementary school students by considering user interface design, ease of use, material accuracy, and the integration of HOTS questions. Before being used in classroom learning, the application was validated by media experts, material experts, and learning experts to ensure the feasibility of content, design, and media functionality. Once declared feasible, the product was implemented with students to determine its level of practicality and its effectiveness in enhancing critical thinking skills and Social Studies learning achievement.

Data collection techniques included observation, interviews, questionnaires, tests, and documentation. Observation and interviews were conducted to obtain information regarding initial learning conditions and the needs of both teachers and students. Questionnaires were used to collect data from expert validation as well as teacher and student responses toward the developed media. Tests consisting of pre-tests and posttests were used to measure changes in critical thinking skills and learning outcomes after using the game application, while documentation served as supporting data throughout the research implementation.

Data collected were analyzed using qualitative and quantitative analyses. Qualitative analysis was used to process observation results, interviews, and feedback from validators and media users. Quantitative analysis was used to process expert validation scores, questionnaire results, pre-test and post-test scores, and other data indicating the feasibility, practicality, and effectiveness levels of the "Prok-Prok" game application. The analysis results formed the basis for determining whether the developed learning media was suitable for use and capable of enhancing students' critical thinking skills and learning achievement.

RESULTS AND DISCUSSION

The development of the "Prok-Prok" game application progressed through needs analysis, product design, application development, expert validation, product revision, to implementation with fifth-grade elementary students. Each stage yielded information regarding the quality of the developed product to determine whether the media met feasibility standards prior to classroom use.

Validation results revealed that the application was evaluated by media experts, material experts, and learning experts. This evaluation assessed content accuracy, visual quality, ease of use, and alignment with learning

DEVELOPMENT OF THE HOTS-BASED "PROK-PROK" GAME APPLICATION TO IMPROVE CRITICAL THINKING SKILLS AND SOCIAL STUDIES LEARNING ACHIEVEMENT OF FIFTH-GRADE STUDENTS AT SDN SUKOLILO 01

Ellenna Ayu Maywulandari et al

objectives. Feedback from validators served as the basis for revisions, ensuring the product achieved higher quality before being implemented with students.

Subsequent field testing was conducted with students to measure the application's level of practicality. Data were gathered through teacher and student response questionnaires, alongside observations during the learning process. These results demonstrated that the learning media functioned well, captured student attention, increased student engagement, and made it easier for teachers to convey Social Studies content regarding the Event of the Proclamation of Indonesian Independence.

The application's effectiveness was evaluated using pre-tests and post-tests. A comparison of results before and after using the application demonstrated an increase in critical thinking skills as well as Social Studies learning achievement. Thus, the HOTS-based "ProkProk" game application was declared capable of making a positive impact on both the learning process and learning outcomes.

The use of educational games is seen as capable of increasing learning motivation by offering an interactive and enjoyable learning experience, while the application of HOTS questions encourages students to analyze, evaluate, and solve problems, thereby fostering better critical thinking skills. The research findings align with previous studies showing similar trends—that game-based learning media can enhance educational quality and student learning outcomes.

The research implications suggest that the "Prok-Prok" game application can serve as an alternative learning medium for Social Studies in elementary schools. The developed product not only improves learning outcomes but also assists teachers in implementing more innovative, student-centered learning that leverages digital technology and supports the development of critical thinking skills required in 21st-century education. These findings reinforce the importance of integrating technology and HOTS approaches into the learning process to elevate the quality of primary education.

CONCLUSION

The research successfully developed a Higher Order Thinking Skills (HOTS)-based "ProkProk" game application as a Social Studies learning medium on the topic of the Event of the Proclamation of Indonesian Independence for fifth-grade elementary students. The product was developed using the Research and Development (R&D) method following the ADDIE model, producing a learning medium tailored to student characteristics and elementary school learning needs. This conclusion directly addresses the research objective outlined in the introduction—to produce an innovative, technology-based learning medium capable of raising the quality of Social Studies learning. The "Prok-Prok" game application underwent validation by media experts, material experts, and learning experts, and was declared feasible for use as an instructional medium. Validation results showed that content material, visual design, and instructional aspects met feasibility criteria. Consequently, the developed product not only meets academic standards but is also ready for implementation in elementary school classroom.

The implementation of the HOTS-based game application drew positive responses from both teachers and students. The media was rated as attractive, easy to use, effective in increasing student participation, and capable of creating a more active and enjoyable learning atmosphere compared to conventional instruction. These findings indicate that game-based digital learning media can improve the quality of the Social Studies learning process. Furthermore, the "Prok-Prok" application proved effective in boosting students' critical thinking skills and Social Studies learning achievement. This was evidenced by measurements taken before and after media implementation (pre-test and post-test), which showed an improvement in student capabilities following learning with the HOTSbased game application. Thus, the primary objective of the study—improving critical thinking skills and Social Studies learning achievement—was achieved.

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DEVELOPMENT OF THE HOTS-BASED “PROK-PROK” GAME APPLICATION TO IMPROVE CRITICAL THINKING SKILLS AND SOCIAL STUDIES LEARNING ACHIEVEMENT OF FIFTH-GRADE STUDENTS AT SDN SUKOLILO 01

Ellenna Ayu Maywulandari *et al*

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DEVELOPMENT OF THE HOTS-BASED “PROK-PROK” GAME APPLICATION TO IMPROVE CRITICAL THINKING SKILLS AND SOCIAL STUDIES LEARNING ACHIEVEMENT OF FIFTH-GRADE STUDENTS AT SDN SUKOLILO 01

Ellenna Ayu Maywulandari **et al**

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DEVELOPMENT OF THE HOTS-BASED “PROK-PROK” GAME APPLICATION TO IMPROVE CRITICAL THINKING SKILLS AND SOCIAL STUDIES LEARNING ACHIEVEMENT OF FIFTH-GRADE STUDENTS AT SDN SUKOLILO 01

Ellenna Ayu Maywulandari **et al**

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Ellenna Ayu Maywulandari *et al*

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Ellenna Ayu Maywulandari **et al**

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