

TRAINING ON INTEGRATING BLOOKET INTO PROBLEM-BASED LEARNING TO ENHANCE STUDENTS' CRITICAL THINKING SKILLS AT SMA NEGERI 2 UNGARAN

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ABSTRAK

Berpikir kritis merupakan kecakapan fundamental yang wajib dibangun dalam proses pembelajaran ekonomi, akan tetapi pendekatan pembelajaran tradisional yang masih mendominasi kelas menjadi kendala terbesar dalam pengembangannya. Pengabdian ini bertujuan mengimplementasikan game blooKet terintegrasi pada PBL dalam meningkatkan kemampuan berpikir kritis peserta didik kelas XI SMA Negeri 2 Ungaran. Metode pelaksanaan pengabdian yakni sosialisasi, pelatihan, penerapan teknologi dan evaluasi. Fokus pengabdian dilakukan pada siswa kelas XI 7 dengan jumlah 36 siswa pada mata pelajaran ekonomi. Evaluasi menggunakan tes pilihan ganda yang dirancang berdasarkan indikator kemampuan berpikir kritis tingkat C4, C5, dan C6. Implementasi game BlooKet pada siswa dapat meningkatkan berpikir kritis siswa dengan N-Gain sebesar 71,74%, masuk dalam kategori tinggi dan tergolong cukup efektif (56%–75%). Sehingga, disimpulkan integrasi game BlooKet dalam PBL mampu menciptakan suasana belajar yang aktif, kompetitif, dan menyenangkan sehingga mendorong siswa berpikir lebih kritis.

ABSTRACT

Critical thinking is a fundamental competency that must be developed in economics learning. However, the dominance of traditional teaching approaches in the classroom remains a major obstacle to fostering this skill. This community service project aimed to implement the integration of the BlooKet game into the Problem-Based Learning (PBL) model to improve the critical thinking skills of Grade XI students at SMA Negeri 2 Ungaran. The implementation consisted of five stages: socialization, training, technology implementation, and evaluation. The program was conducted in Class XI-7, involving 36 students enrolled in the economics course. The evaluation employed multiple-choice tests designed based on higher-order critical thinking indicators at the C4 (analyzing), C5 (evaluating), and C6 (creating) cognitive levels. The results indicated that the implementation of the BlooKet game significantly improved students' critical thinking skills, with an N-Gain score of 71.74%, which falls into the high category and is considered moderately effective (56%–75%). Therefore, it can be concluded that integrating the BlooKet game into the PBL model creates an active, competitive, and enjoyable learning environment that effectively encourages students to think more critically.

INTRODUCTION

Education serves as the primary foundation for developing high-quality human resources capable of addressing the challenges of the twenty-first century. One of the most essential competencies emphasized in twenty-first-century learning is critical thinking, which refers to the ability to think systematically in analyzing problems and formulating evidence-based solutions (Ariadila et al., 2023). This competency has become increasingly important due to the rapid advancement of technology and information, which requires individuals to critically evaluate, filter, and utilize information responsibly. However, the development of students' critical thinking skills in Economics education continues to face significant challenges, primarily because traditional teacher-centered instructional approaches remain dominant and are insufficient to foster deep and critical thinking among students (Richardo et al., 2023).

The low level of Indonesian students' critical thinking skills is reflected in various empirical indicators. International evidence shows that Indonesia ranked among the bottom twelve of the eighty-one participating countries in the 2022 Programme for International Student Assessment (PISA) survey (Ramadhan et al., 2023), indicating the relatively low level of higher-order thinking skills among Indonesian students. Hadi (2021) argues that students' tendency to memorize rather than develop conceptual understanding constitutes one of the major obstacles to cultivating critical thinking skills. Furthermore, the continued dominance of lecture-based instruction results in passive knowledge acquisition, limiting students' opportunities to develop analytical, evaluative, and problem-solving abilities in authentic learning contexts (Pratama et al., 2019; Bosica et al., 2021).

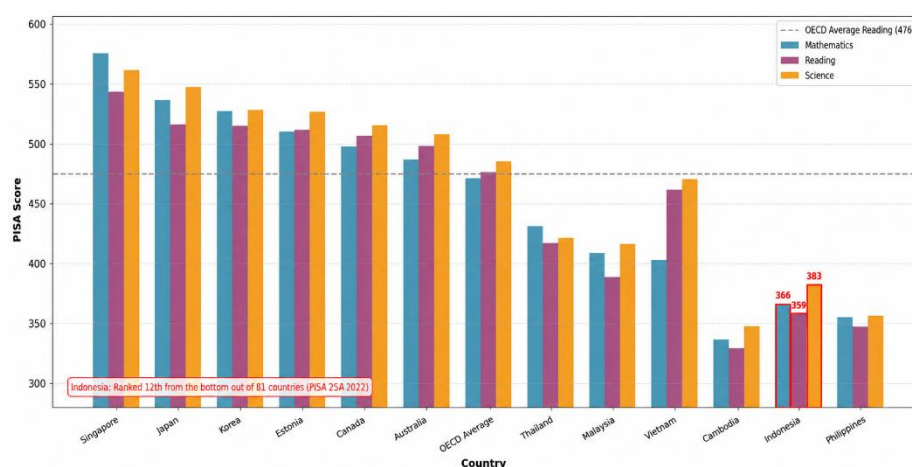


Figure 1. Comparison of Indonesia's 2022 PISA Scores with Asian Countries and OECD Average

A similar condition was observed at SMA Negeri 2 Ungaran. Based on preliminary classroom observations and interviews conducted by the researchers with the Grade XI Economics teacher, Mr. Ari Susanto, S.Pd., it was found that students' participation during classroom instruction remained relatively low due to monotonous, teacher-centered learning activities. Students tended to complete exercises mechanically by relying solely on examples provided by the teacher without developing independent critical reasoning. This finding is supported by the Final Semester Examination (FSE) results for the first semester of the 2025/2026 academic year. The average score of Grade XI Class 7 was only 69, with a passing rate of 52.78%, while Grade XI Class 8 obtained an average score of 68, with a passing rate of 41.67%. Both results remain substantially below the school's Minimum Mastery Criterion (MMC) of 75. These findings indicate low learning achievement, which is directly associated with students' underdeveloped critical thinking skills (Murniawaty et al., 2025).

One instructional model that has been widely recognized as effective in addressing this issue is Problem-Based Learning (PBL). PBL is a student-centered instructional approach that engages learners in collaboratively solving authentic problems, thereby inherently promoting the development of critical thinking skills (Tahsinia et al., 2022; Kurniawati et al., 2024). Previous studies have consistently demonstrated that PBL effectively improves students' critical thinking abilities across various subject areas (Effendi et al., 2022; Butar et al., 2022; Nurlaeli, 2022). From the perspective of constructivist learning theory (Vygotsky, 1978), PBL embodies the principle that knowledge is actively constructed through social interaction and authentic problem-solving experiences rather than passively transmitted from teachers to students.

To optimize the implementation of PBL, interactive instructional media that actively engage students in meaningful learning experiences are essential. One digital learning medium that aligns with the characteristics of today's learners is Blooket, a gamified online learning platform that has been shown to enhance students' learning motivation and critical thinking skills (Paudia et al., 2024; Adiningsih, 2024). Blooket offers various interactive game modes that encourage healthy competition and active student participation throughout the learning process. Alfajri and Yamin (2025) reported that integrating PBL with Blooket resulted in significantly higher learning outcomes in the experimental group than in the control group.

Although the effectiveness of PBL and Blooket has been widely demonstrated individually, studies integrating both approaches in the context of senior high school Economics education remain limited. This gap represents an important research opportunity that warrants empirical investigation. Therefore, this study aims to examine the effectiveness of the Problem-Based Learning model assisted by the Blooket game in improving the critical thinking skills of Grade XI students in Economics at SMA Negeri 2 Ungaran. The findings of this study are expected to provide empirical evidence that can serve as valuable references for teachers, schools, and future researchers in developing more innovative, effective, and competency-oriented instructional practices to meet the demands of twenty-first-century education.

METHOD

This community service program was conducted at SMA Negeri 2 Ungaran, Semarang Regency, Central Java, Indonesia. The participants consisted of 36 students from Class XI-7 enrolled in the Economics course. In general, the implementation of this community service program consisted of five stages, as illustrated in Figure 2.

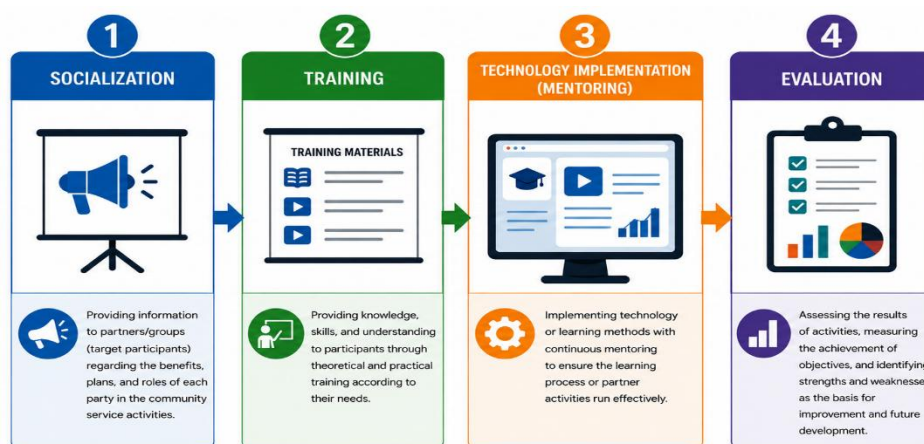


Figure 2. Stages of the Community Service Programs

a. Socialization

The socialization stage was conducted with the Grade XI Economics teacher and the school administrators of SMA Negeri 2 Ungaran, who served as the community service partners. The activities included: (1) introducing the Problem-Based Learning (PBL) model and its importance in enhancing students' critical thinking skills; (2) introducing the Game Blooket platform as a gamification-based learning medium that supports the implementation of PBL; and (3) explaining the procedures and mechanisms for integrating Game Blooket into the stages of the PBL model in Economics instruction. During this stage, the community service team discussed with the partner teacher the existing conditions of Economics learning, the challenges encountered by students, and the potential implementation of PBL assisted by Game Blooket in Grade XI classrooms.

b. Training

The training stage was conducted through direct demonstrations provided by the community service team to the partner teacher. The training covered: (1) designing PBL-based learning scenarios for the topic of economic growth and development; (2) creating, configuring, and managing quizzes and interactive games using the Game Blooket platform; (3) integrating Game Blooket into each phase of the PBL model, including problem orientation, student organization, guided investigation, presentation of findings, and evaluation; and (4) developing higher-order thinking skills (HOTS)-based assessment instruments (C4, C5, and C6) to measure students' critical thinking skills in alignment with the learning activities. At this stage, the partner teacher observed the demonstrations and actively participated in discussions regarding the technical adaptation of Game Blooket to the school's facilities and classroom conditions.

c. Technology Implementation

The technology implementation stage involved the direct application of the PBL model assisted by Game Blooket in Class XI-7. The activities included: (1) the teacher implementing Game Blooket directly during Economics instruction; (2) administering a pre-test to the students before the learning activities using an assessment instrument designed to measure critical thinking skills at the cognitive levels of C4, C5, and C6; and (3) implementing all phases of the PBL model with the support of Game Blooket as an interactive learning medium throughout the instructional process.

d. Evaluation

The evaluation stage was carried out to assess the overall effectiveness of the community service program. The evaluation focused on several aspects: (1) the progress and success of the partner teacher in independently implementing the PBL model assisted by Game Blooket in classroom instruction; (2) the improvement of critical thinking skills among the Grade XI-7 students, measured by comparing pre-test and post-test scores using the normalized gain (N-Gain) analysis; and (3) the effectiveness of integrating Game Blooket into each phase of the PBL model, as assessed through classroom observations and teacher reflections.

RESULT AND DISCUSSION

a. Socialization Stage

The results of the community service activities during the socialization stage demonstrated effective and participatory interaction between the service team, the Economics teacher, and the eleventh-grade students of SMA Negeri 2 Ungaran. The activity began with a presentation delivered by the service team, focusing on the introduction of the Problem-Based Learning (PBL) model assisted by the Blooket game as an instructional innovation designed to enhance students' critical thinking skills. At this stage, the facilitators comprehensively explained the rationale for implementing the PBL

model, the objectives of integrating Blooket as a gamification-based learning medium, and its strategic benefits in promoting students' active engagement at higher-order cognitive levels, namely analyzing (C4), evaluating (C5), and creating (C6) according to Anderson and Krathwohl's Revised Bloom's Taxonomy (2001). Students demonstrated enthusiasm and active participation by attentively following the presentation, taking notes on essential information, and relating the introduced learning model to their previous learning experiences. Cahyani (2022) emphasized that introducing the PBL model to students is essential to help them understand the problem-based learning process and actively participate in every learning phase.



Figure 3. Socialization Activity of the Blooket Game

The activity continued with a more technical and practical explanation of the procedures for using the Blooket game. The service team explained the steps for accessing Blooket through web browsers or smartphones, introduced its available features and game modes, and demonstrated the procedures for answering questions and utilizing the real-time feedback generated by the system. During this session, the service team acted as facilitators by providing a live demonstration of the platform and explaining its potential to support interactive and competitive problem-based learning. Students actively participated through discussions and question-and-answer sessions regarding the technical use of the application, device readiness, and the integration of Blooket with the PBL model that would be implemented in Economics learning.

During the discussion session, intensive two-way communication occurred between the facilitators and students. Students expressed questions, opinions, and learning experiences concerning the need for more engaging and enjoyable instructional approaches. The facilitators responded by providing clarifications, technical solutions, and practical illustrations of how Blooket would be integrated into each phase of the PBL process. Overall, the socialization activities enhanced students' understanding of the PBL model and the Blooket platform while fostering their readiness and motivation to actively participate in the subsequent learning process.

b. Training Stage (Implementation of the PBL Model Assisted by the Blooket Game)

The implementation stage demonstrated active collaboration among the service team as observers, the Economics teacher as the facilitator, and the students as active participants. Learning activities were conducted using a participatory problem-based approach in which the teacher served as a facilitator and mentor, while students actively constructed their own knowledge through meaningful learning experiences. Arief and Sudin (2016) argued that the PBL model effectively facilitates the development of students' critical thinking and higher-order thinking skills.

During the problem orientation phase, the teacher presented a contextual case study concerning disparities in economic growth and economic development across regions in Indonesia. The Blooket game was used as a warm-up quiz to activate students' prior knowledge before introducing the main problem. This activity enabled students to understand the context of the problem and relate it to their existing knowledge of economics.

The organizing phase continued with the formation of small learning groups. At this stage, Blooket served as a discussion trigger to reinforce students' preliminary conceptual understanding within each group. During the investigation phase, students actively discussed, searched for references, and analyzed factors influencing economic growth and development. Blooket was further utilized to provide Higher-Order Thinking Skills (HOTS)-based analytical questions, enabling students to practice thinking at the levels of analysis (C4), evaluation (C5), and creation (C6). Melihayatri et al. (2025) stated that implementing the PBL model positively influences students' creativity and critical thinking skills by encouraging collaborative problem-solving in authentic contexts.



Figure 4. Demonstration of the Blooket Game

During the presentation phase, each group presented its proposed solutions and analytical findings to the class, while other groups responded by providing constructive arguments and feedback. The evaluation phase concluded with the use of Blooket as an interactive and competitive learning assessment tool. The interaction among the facilitators, teachers, and students throughout the learning process not only strengthened students' conceptual understanding of economic growth and development but also promoted continuous reflection and the development of critical thinking skills.

c. Mentoring Stage (Technology Implementation Stage)

The technology implementation stage represented the direct application of the Problem-Based Learning (PBL) model assisted by the Blooket game in the experimental class (Grade XI-7). During this stage, the teacher implemented Blooket directly in the Economics classroom. The teacher first created a game set consisting of questions aligned with the Economics learning materials and subsequently distributed the access code to all students, enabling them to participate in the game simultaneously in real time. Blooket functioned as an interactive gamification-based learning medium designed to enhance students' engagement, motivation, and enthusiasm throughout the learning process.

Before the main learning activities began, students in the experimental class completed a pre-test consisting of higher-order critical thinking questions covering the cognitive levels of analyzing (C4), evaluating (C5), and creating (C6). The pre-test aimed to measure students' initial critical thinking

abilities prior to the instructional intervention so that the results could later be compared with the post-test scores to determine the effectiveness of the implemented learning model.

Subsequently, the teacher implemented all phases of the PBL model with the support of Blooket as an interactive learning medium. The learning process began with the problem orientation phase, during which the teacher introduced contextual economic problems. The process then continued through the organizing phase, individual and group investigations, the development and presentation of students' work, and finally the analysis and evaluation phase. Throughout these stages, Blooket functioned both as an engagement tool that maintained students' enthusiasm and as an interactive formative assessment instrument, making the learning process more meaningful, enjoyable, and effective.



Figure 5. Technology Implementation Using the Blooket Game

d. Evaluation Stage

The evaluation stage was conducted through a structured assessment process designed to measure the effectiveness of implementing the Problem-Based Learning (PBL) model assisted by the Blooket game in improving students' critical thinking skills. The evaluation involved statistical data analysis using IBM SPSS Statistics Version 26, focusing on two primary aspects: (1) the improvement of students' critical thinking skills as measured using the Normalized Gain (N-Gain) Score, and (2) the implementation fidelity of the PBL model assisted by the Blooket game based on observation sheets. To evaluate the improvement in students' critical thinking skills, this study employed the Normalized Gain (N-Gain) Score. The N-Gain values were interpreted according to the classification proposed by Hake (1999), as presented in the following table 1.

Table 1. N-Gain Score Classification Criteria

No	N-Gain Score	Category	Effectiveness Interpretation
1	$g \geq 0,7$	High	Effektive (>75%)
2	$0,3 \leq g < 0,7$	Moderate	Moderately effective (56%–75%)
3	$g < 0,3$	Low	Less effective (<56%)

Based on the pre-test and post-test data collected from 36 students, the evaluation results indicated a significant improvement in students' critical thinking skills in both classes, as presented below:

Table 2. Evaluation Results of the Improvement in Students' Critical Thinking Skills

Measured Aspect	Mean Pre-test Score	Mean Post-test Score	N-Gain Score	N-Gain Category	Interpretation
Students' critical thinking skills	59,08	88,11	0,7174 (71,74%)	High	Moderately Effective

The evaluation results demonstrated a significant improvement in students' critical thinking skills following the implementation of the Problem-Based Learning (PBL) model assisted by the Blooket game in the Economics subject for Grade XI students at SMA Negeri 2 Ungaran. This improvement was reflected in the comparison between the pre-test and post-test scores as well as the change in students' achievement categories based on the Hake (1999) N-Gain Score criteria.

The implementation of the PBL model assisted by the Blooket game resulted in an N-Gain score of 71.74%, which falls into the high category and is classified as moderately effective (56%–75%). During the pre-test, most students were unable to correctly answer Higher-Order Thinking Skills (HOTS) questions at the analysis (C4), evaluation (C5), and creation (C6) levels, with a mean score of 59.08. Following the implementation of the PBL model supported by Blooket, students demonstrated substantial improvements in their abilities to analyze, evaluate, and make informed decisions, as evidenced by the increase in the mean post-test score to 88.11.

These findings indicate that integrating Blooket into the PBL model created an active, competitive, and engaging learning environment that encouraged students to develop higher levels of critical thinking. In this regard, Alfajri and Yamin (2025) reported that the integration of the Blooket game into problem-based learning is easy to implement and has been shown to significantly enhance students' active participation and learning outcomes.

Despite these positive outcomes, several challenges were encountered during the implementation. The primary limitation was the dependence on a stable internet connection to access the Blooket platform. When the network connection became unstable, interruptions occurred during the game sessions. To address this issue, the service team provided backup internet access through personal mobile hotspots and coordinated with the school to optimize the use of the school's Wi-Fi facilities throughout the Blooket learning sessions.

CONCLUSION AND RECOMMENDATIONS

Conclusion

Based on the implementation of this community service program, which aimed to analyze the effectiveness of the Problem-Based Learning (PBL) model assisted by the Blooket game in improving the critical thinking skills of Grade XI students in Economics at SMA Negeri 2 Ungaran, the following conclusions:

1. the implementation of the PBL model supported by the Blooket game proved effective in enhancing students' critical thinking skills. Prior to the intervention, classroom instruction was predominantly conducted using conventional teaching methods that provided limited opportunities for students to actively engage in higher-order thinking processes. The integration of Blooket into the PBL learning phases successfully created an active, interactive, and meaningful learning environment, enabling students to develop higher-order cognitive skills, particularly in analyzing (C4), evaluating (C5), and creating (C6), in accordance with Anderson and Krathwohl's Revised Bloom's Taxonomy (2001).

2. the sequence of activities, including socialization, classroom implementation, instrument administration, mentoring, and evaluation, effectively improved students' critical thinking skills. Students demonstrated enhanced abilities to identify economic problems, critically analyze factors influencing economic growth and development, and formulate logical, systematic, and evidence-based solutions. These findings indicate that integrating gamification through Blooket with the PBL approach can serve as an effective instructional strategy for fostering students' higher-order thinking skills in Economics education.

Recommendations

The PBL model assisted by the Blooket game is recommended for implementation in other subject areas, across different grade levels, and in various educational institutions to broaden the impact of this instructional innovation on educational quality. Future implementations should also consider the availability of technological resources, including students' access to smartphones or laptops and reliable internet connectivity, to ensure the effective integration of Blooket into classroom learning activities.

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