

THE EFFECTIVENESS OF THE PROBLEM BASED LEARNING MODEL ASSISTED BY MIND MAPPING ON STUDENTS' ECONOMIC LITERACY ACHIEVEMENT AT SMA NEGERI 2 SLAWI

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Abstract

This research was motivated by the suboptimal practical economic literacy achievement of tenth-grade students at SMA Negeri 2 Slawi, resulting from the dominance of the lecturing method and the implementation of problem-based learning that had not been supported by adequate learning media. This study aims to examine the effectiveness of the problem-based learning model assisted by mind mapping on students' economic literacy achievement on the Non-Bank Financial Institutions material. The research employed a quasi-experimental design with a population of all tenth-grade students at SMA Negeri 2 Slawi. The sample was determined through a purposive cluster sampling technique, resulting in class X.7 as the experimental group receiving the treatment of problem-based learning assisted by mind mapping, and class X.1 as the control group undergoing problem-based learning without mind mapping. Data on economic literacy achievement were collected through a questionnaire based on the three OECD (2022) dimensions, namely financial knowledge, financial behaviour, and financial attitude, and then analyzed using the Independent Sample T-Test. The results showed that the posttest mean score of the experimental group (73.57) was higher than that of the control group (64.11), with a t-test result of $t = 4.709$; $df = 69$; $Sig. = 0.000$ (< 0.05). These findings prove that there is a significant difference in economic literacy achievement between the two groups, so that the problem-based learning model assisted by mind mapping is proven effective in improving students' practical economic literacy achievement.

Keywords: Problem Based Learning; Mind Mapping; Economic Literacy; Senior High School Students;

1 INTRODUCTION

Economic literacy is no longer understood merely as the mastery of theory, but also as intelligence in everyday economic behavior. Economic literacy includes the ability to understand and apply economic concepts in the real world in order to make wise decisions, thus requiring real action rather than cognitive understanding alone (Rumbou & Jawa, 2025). In other words, perfect economic literacy achievement demands a balance between cognitive literacy and practical literacy (Aisyah & Srigustini, 2022).

This gap between theoretical understanding and practical application was also found among tenth-grade students at SMA Negeri 2 Slawi. The results of a preliminary questionnaire showed that 55% of students still had difficulty managing their pocket money and distinguishing between needs and wants, while 91.7% of students considered the economics material taught at school to be useful only for exams and less relevant to daily life. The economics teacher also confirmed that students were only proficient at the theoretical level, but had not shown awareness to apply it optimally. This condition is in line with the finding that students' practical abilities will not develop without continuous training through direct and contextual learning experiences (Gulo et al., 2025), and that consumptive habits and low awareness of long-term financial planning are still widely found among senior high school students (Adila et al., 2024).

One root of this problem is the dominance of one-way learning methods. As many as 75% of students stated that teachers still frequently use the lecturing method, which makes students passive and insufficiently trained in practicing economic concepts (Faisal et al., 2025). Active learning methods, accompanied by simulation and direct practice, are considered more capable of leading students toward practical economic literacy (Perkasa et al., 2024). Problem-based learning is one relevant model because it places students at the center of learning with authentic problems as the starting point (Wijayanto, 2025), encourages active engagement and creative thinking (Nurlaila & Mubarak, 2023), and serves as a medium for students to understand and internalize scientific principles and concepts through real cases (Khairunnisa et al., 2025; Ismail et al., 2024).

The effectiveness of problem-based learning can be enhanced when combined with mind mapping as a medium for visualizing analytical results. Mind mapping is a technique that utilizes the work of both the right and left brain comprehensively to understand, organize, and store information (Tambunan et al., 2023), and has been proven effective in helping students bridge conceptual understanding with engaging visuals, thereby improving critical and creative thinking skills (Faradiba, 2024). A meta-analysis of 21 empirical studies by Shi et al. (2023) also showed that mind-mapping-based learning consistently produces better cognitive learning outcomes compared to conventional learning. Thus, the combination of problem-based learning and mind mapping not only trains students to analyze problems but also guides them to visually and systematically map the relationships between concepts.

From the dependent variable side, the scope of economic literacy has also continued to expand, from merely basic cognitive skills into a life-skill competency that bridges theory with everyday decision-making (Rachma, 2024; Wideaningputri & Andriansyah, 2025). Students' practical economic literacy achievement itself is influenced by various interrelated factors, including the learning model used by the teacher (Putri & Wulandari, 2025; Simbolon & Naibaho, 2023), economic education within the family (Narmaditya et al., 2023), as well as students' learning motivation and interest (Anggraeni et al., 2026). These findings confirm that intervention on the aspect of the learning model, as tested in this study, is one strategic effort to promote students' economic literacy achievement.

A number of previous studies further support the basic assumptions of this research. Nurmaya et al. (2023) confirmed a mutually reinforcing relationship between problem-based learning assisted by mind mapping and students' higher-order cognitive achievement. Imanuela et al.'s (2026) study on Geography subjects proved that problem-based learning assisted by digital mind mapping effectively improved students' critical thinking skills and learning independence (Sig. < 0.005), while Lestari et al. (2026) found that PBL assisted by mind mapping produced higher achievement than PBL assisted by PowerPoint. Hasanah (2026), through classroom action research, also reported a positive student response to the implementation of PBL assisted by mind mapping. These three studies support the assumption that the integration of PBL and mind mapping has the potential to be effective when applied to other cognitive and practical variables, including economic literacy, although the subject context and dependent variables differ from this study.

Based on the description above, this research was formulated to answer the following question: is there a significant difference in economic literacy achievement between students who apply problem-based learning assisted by mind mapping and students who apply problem-based learning without mind mapping? This study aims to examine the effectiveness of the problem-based learning model assisted by mind mapping on the economic literacy achievement of tenth-grade students at SMA Negeri 2 Slawi on the Non-Bank Financial Institutions material, with the hypothesis that there is a significant difference in economic literacy achievement between the two groups.

2 METHODOLOGY

This study used a quantitative approach with a quasi-experimental method, involving an experimental group and a control group, each of which received a pretest and posttest. The research population consisted of all tenth-grade students at SMA Negeri 2 Slawi, comprising nine classes with a total of 320 students. The sample was determined through a purposive cluster sampling technique based on the equivalence of end-of-semester assessment scores, resulting in class X.7 (36 students) as the experimental group receiving the treatment of problem-based learning assisted by mind mapping, and class X.1 (35 students) as the control group undergoing problem-based learning without mind mapping.

The independent variable in this study is the problem-based learning model assisted by mind mapping (X), namely a five-phase learning sequence (problem orientation, learning organization, group investigation, presentation of results, and evaluation/reflection) on the Non-Bank Financial Institutions material, in which students constructed mind maps following Buzan's (2019) guidelines during the learning-organization through presentation-of-results phases. The dependent variable is economic literacy achievement (Y), namely the level of students' proficiency in understanding and applying economic concepts to make everyday decisions, measured through three OECD (2022) dimensions: financial knowledge, financial behaviour, and financial attitude.

Data on economic literacy achievement were collected using an 18-item Likert-scale (1–5) questionnaire consisting of six items per dimension, administered online via Google Forms during the pretest and posttest in both groups. The maximum score students could obtain was 90. The validity test using product moment

correlation showed that all 18 statement items were valid, with rcount values ranging from 0.407 to 0.735 (rtable = 0.361 at n = 30). The reliability test using Cronbach's Alpha formula showed a coefficient of 0.880, so the instrument was declared reliable with a very high category.

Prior to hypothesis testing, prerequisite tests were conducted, namely a normality test (Shapiro-Wilk), a homogeneity of variance test (Levene's Test), and an initial equivalence test between the two groups. Hypothesis testing was conducted through an Independent Sample T-Test on the posttest data of economic literacy achievement with a significance level of 0.05, using SPSS software.

3 RESULTS

3.1 Prerequisite Analysis Test

The normality test of the posttest economic literacy achievement data using Shapiro-Wilk showed a significance value of 0.400 in the experimental group and 0.316 in the control group (both > 0.05), so the posttest data were declared normally distributed. Meanwhile, the homogeneity of variance test using Levene's Test produced a significance value of 0.497 (> 0.05), indicating that the variances of the two groups were homogeneous, so the interpretation of the Independent Sample T-Test referred to the Equal Variances Assumed row. The initial equivalence test using the Mann-Whitney Test on the pretest data — since the pretest data were not normally distributed — showed an Asymp. Sig. (2-tailed) value of 0.101 (> 0.05), proving that both groups started from an equivalent initial ability before being given the treatment.

3.2 Pretest and Posttest Comparison

The mean economic literacy achievement scores of both groups at pretest and posttest are presented in Figure 1.

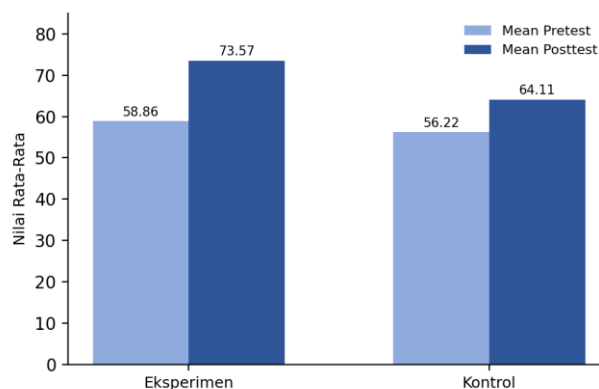


Figure 1. Comparison of Mean Pretest and Posttest Scores of Economic Literacy Achievement in the Experimental and Control Groups

The experimental group experienced a mean increase from 58.86 (pretest) to 73.57 (posttest), while the control group increased from 56.22 (pretest) to 64.11 (posttest). The mean posttest difference between the two groups was 9.460 points, with the experimental group outperforming the control group.

3.3 Hypothesis Testing

Hypothesis testing was conducted through an Independent Sample T-Test on the posttest data of economic literacy achievement. The complete test results are presented in Table 1.

Table 1. Independent Sample T-Test Results for Economic Literacy Achievement

Group	N	Mean	Std. Dev.	t	df	Sig. (2-tailed)	Mean Diff.
Experimental	36	73.57	7.709	4.709	69	0.000	9.460
Control	35	64.11	9.136				

Source: SPSS Output, data processed, 2026

The Independent Sample T-Test produced a t value of 4.709 with $df = 69$ and a significance of 0.000 (< 0.05), so H_0 was rejected and H_1 was accepted. This result proves that there is a significant difference in economic literacy achievement between the group that applied problem-based learning assisted by mind mapping and the group that applied problem-based learning without mind mapping. The problem-based learning model combined with mind mapping not only directs students to understand theory but also requires them to analyze real economic problems and visually translate the results of their analysis into a mind map. This process directly trains the three dimensions of practical economic literacy according to the OECD (2022) framework, namely financial knowledge, financial behaviour, and financial attitude, so that this model proves to be an effective bridge between theoretical understanding and the ability to apply it in students' practical lives (Suriswo, 2024; Buzan, 2019).

In contrast, the control group, which only applied problem-based learning without mind mapping, was unable to move beyond mere conceptual understanding. Students' practical abilities will not grow alongside their cognitive abilities if not trained continuously through direct and contextual learning experiences (Gulo et al., 2025). The large mean posttest difference between the two groups (9.460 points) is evidence that mind mapping, as a supporting medium in problem-based learning, plays a significant role in bridging the cognitive and practical domains of students' economic literacy.

These findings are consistent with Nurmaya et al. (2023), who confirmed a mutually reinforcing relationship between problem-based learning assisted by mind mapping and students' cognitive and practical achievement. They are also in line with a number of previous studies in other subjects that showed the superiority of PBL assisted by mind mapping compared to PBL without mind mapping or other supporting media, such as in critical thinking achievement and learning independence (Imanuela et al., 2026) and in comparison with PBL assisted by PowerPoint (Lestari et al., 2026), even though the subject context and dependent variables tested differ. In terms of determining factors, this result also reinforces the view that the learning model is one important determinant of students' economic literacy achievement (Putri & Wulandari, 2025; Simbolon & Naibaho, 2023), alongside family factors (Narmaditya et al., 2023) and learning motivation (Anggraeni et al., 2026), which fall outside the scope of this study's intervention.

4 CONCLUSIONS

Based on the results of the research and discussion, it can be concluded that the problem-based learning model assisted by mind mapping is proven effective in improving the practical economic literacy achievement of tenth-grade students at SMA Negeri 2 Slawi on the Non-Bank Financial Institutions material. This is evidenced by the significant difference in posttest economic literacy achievement scores between the experimental and control groups ($t = 4.709$; $\text{Sig.} = 0.000 < 0.05$), with the experimental group obtaining a higher mean score than the control group.

The implication of this finding is that economics teachers are advised to integrate mind mapping as a supporting medium in the implementation of problem-based learning, particularly on material that requires the application of concepts in everyday economic decision-making. For future researchers, it is recommended to expand the research to other economics topics, enlarge the sample coverage, and explore other variables that also influence students' practical economic literacy achievement.

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