

ANALYSIS OF STUDENTS' MATHEMATICAL CONCEPT UNDERSTANDING REGARDING SIMPLE AND COMPOUND INTEREST WITHIN THE CONTEXT OF FINANCIAL LITERACY

Selviyah khasanah^{1*}, Dr. Munadi², Dian Nataria Oktaviani, S.Si., M.Pd³

¹²³Universitas Pancasakti Tegal (INDONESIA)
selviyahkhasanah116@gmail.com

Abstract

A sound grasp of mathematical concepts is essential in mathematics education, particularly when students study simple and compound interest within financial literacy settings. This research examines students' conceptual understanding of simple and compound interest through a financial literacy context. A qualitative descriptive design was employed. The research involved 32 students from class XI.3 at SMA Negeri 2 Slawi, with eight students chosen purposively for interviews. Data were gathered through written assessments, semi-structured interviews, and documentation. Data credibility was established through technical triangulation, and the analysis followed the Miles and Huberman framework, covering data reduction, data display, and conclusion formulation. The findings show that the majority of students demonstrated a good level of conceptual understanding. They could describe the concepts in their own words, distinguish the characteristics of simple and compound interest, and use the concepts when addressing financial-literacy problems. Nevertheless, several students found it challenging to relate mathematical ideas to everyday financial situations, choose an appropriate way to solve contextual problems, and interpret the results of their calculations. These findings suggest that incorporating financial literacy contexts into mathematics instruction may help students develop a more meaningful understanding of simple and compound interest.

Keywords: mathematical concept understanding; simple interest; compound interest; financial literacy;

1. INTRODUCTION

Mathematics contributes substantially to the development of logical, critical, systematic, and creative ways of thinking. Within mathematics instruction, conceptual understanding is essential because students are expected to go beyond memorizing formulas: they need to grasp meanings, establish relationships among concepts, and use their knowledge in different problem situations. Students who understand concepts well are generally better able to interpret information, choose suitable solution strategies, and explain the basis of their answers (Sengkey et al., 2023; Zuliyanti & Novaliyosi, 2023). Simple and compound interest are examples of topics that require such understanding. Their application extends beyond numerical calculations because they occur in everyday financial activities, including saving, borrowing, investing, and using credit. For this reason, instruction on simple and compound interest should be connected with financial literacy so students can recognize how mathematical concepts support sound financial decisions (Putri et al., 2025). Financial literacy refers to the ability to understand financial matters, manage them, and make appropriate financial decisions. Bringing financial literacy into mathematics lessons can create learning experiences that are closer to students' real circumstances, allowing them to use mathematical knowledge rather than merely understand it in theory. Such learning is also expected to strengthen students' awareness of responsible financial management (Maulida et al., 2025). Initial observations at SMA Negeri 2 Slawi showed differences in students' conceptual understanding of simple and compound interest. Although some students could complete routine exercises, difficulties emerged when the tasks demanded deeper conceptual understanding within financial contexts. These difficulties included distinguishing the characteristics of simple and compound interest, selecting the concept needed to address a problem, and interpreting calculation results in situations encountered in daily life (Mukaddas et al., 2025).

Earlier studies indicate that conceptual understanding is associated with students' ability to solve mathematical problems successfully. Research on financial literacy in mathematics education likewise

suggests that contextual financial situations can make learning more meaningful because students can relate mathematical ideas to experiences from everyday life. However, studies specifically focusing on students' conceptual understanding of simple and compound interest within financial literacy contexts remain relatively limited. Therefore, this study seeks to describe students' conceptual understanding of the material and identify the difficulties they encounter when dealing with financial-literacy problems. In accordance with this background, the study analyzes students' understanding of mathematical concepts related to simple and compound interest in a financial literacy context. The findings are expected to assist teachers in developing more contextual mathematics learning that strengthens both conceptual understanding and financial literacy (Maulida et al., 2025; Aimi et al., 2025).

2. METHODOLOGY

A qualitative descriptive approach was used in this study to obtain a detailed description of students' understanding of mathematical concepts related to simple and compound interest within a financial literacy context. The research was conducted at a State Senior High School involving 36 students from class XI.3 during the 2025/2026 academic year. 32 students participated in the written test, after which eight students were purposively selected for interviews on the basis of their conceptual-understanding test results. The interviews were intended to obtain more detailed information about students' understanding of simple and compound interest.

Data were obtained from written tests, semi-structured interviews, and documentation. The written assessment was designed to examine conceptual understanding through four indicators: (1) explaining previously learned concepts in one's own words, (2) classifying concepts according to their characteristics, (3) using concepts to solve problems, and (4) relating mathematical concepts to financial literacy contexts. Interviews were used to explore students' approaches to solving the problems in greater depth, whereas documentation served as supplementary evidence. Technical triangulation was used to establish data validity by comparing information from the written tests, interviews, and documentation. Data analysis followed the Miles and Huberman model, consisting of data reduction, data presentation, and conclusion drawing. The analysis was performed throughout the research process to produce findings describing students' conceptual understanding of simple and compound interest in financial literacy situations.

3. RESULTS

3.1 Students' Mathematical Concept Understanding of Single and Compound Interest in the Context of Financial Literacy

The conceptual-understanding test given to 32 students of class XI.3 at SMA Negeri 2 Slawi produced different levels of achievement. Overall, most students showed a good grasp of simple and compound interest. Their performance was reflected in their ability to describe the concepts in their own words, distinguish the characteristics of the two types of interest, and use the concepts to address problems presented in financial literacy contexts. Thus, the findings suggest that most students had developed conceptual knowledge rather than relying solely on calculation procedures. This result is consistent with Sengkey, Deniyanti, and Aziz (2023), who explain that mathematical conceptual understanding can be seen from students' ability to comprehend the meaning of concepts, relate concepts to one another, and use them appropriately when solving problems.

3.2 Conceptual Understanding Based on Indicators

3.2.1 Re-Explaining the Concept

The test and interview data show that most students could describe simple and compound interest in their own words. In their explanations, students indicated that simple interest is determined from the initial capital, which stays unchanged from one period to the next, whereas compound interest is based on capital that grows as previously accumulated interest is added. Their responses suggest that the students had grasped the fundamental meaning of the concepts before using them to solve problems. This result is consistent with

Sengkey et al. (2023), who identify the ability to explain a concept again in one's own words as an important sign of mathematical conceptual understanding.

3.2.2 Classifying Concepts

For the classification indicator, most students were able to tell simple interest apart from compound interest by considering their respective characteristics, formulas, and calculation procedures. Even so, a number of students incorrectly identified the type of interest when the information was presented through everyday financial situations. This pattern suggests that some students still hold misconceptions when distinguishing the two concepts in contextual problems. A similar finding was reported by Mukaddas, Junaid, and Hariyady (2025), whose study found that students may have difficulty distinguishing simple and compound interest when the problems are presented in contextual forms.

3.2.3 Apply a concept

With regard to applying concepts, most students could select the relevant formula and carry out the calculations for simple and compound interest correctly. Some errors were nevertheless found in determining the amount of interest because students did not always interpret the information in the problem carefully. The findings indicate that students' procedural abilities were generally adequate, but their accuracy and understanding of contextual information still require attention. This is comparable to the findings of Aimi, Aima, and Fitri (2025), who reported that students tend to calculate successfully after understanding the underlying concept, yet may encounter difficulties with tasks that demand more extensive analysis.

3.2.4 connecting concepts

The indicator concerning the relationship between mathematical concepts and financial literacy revealed that some students were still unable to interpret their calculation results in order to make suitable financial decisions. Although several students obtained the correct numerical result, they could not clearly explain the reasons one saving or investment alternative would be more advantageous than another. This condition shows that students' ability to use mathematical concepts as part of financial decision-making remains an area for development. The finding is in accordance with Maulida, Franita, and Agustyaningrum (2025), who reported that incorporating financial literacy into mathematics learning can strengthen conceptual understanding and help students connect mathematical ideas with financial situations in everyday life.

3.3 Discussion

Overall, the findings indicate that most participants had a good understanding of mathematical concepts related to simple and compound interest. The main difficulty appeared in tasks requiring students to relate mathematical concepts to financial literacy situations. In other words, being able to carry out calculation procedures did not always mean that students could interpret the results and use the information when considering financial choices. Consequently, mathematics instruction should continue to incorporate financial contexts so that students develop not only calculation skills but also an understanding of the meaning and use of mathematical concepts in daily situations. This finding supports Putri et al. (2025), who describe financial mathematics as a potential means of strengthening both conceptual understanding and financial literacy.

The analysis of conceptual understanding was organized around four indicators: explaining concepts, classifying concepts, applying concepts, and relating concepts to financial literacy. Evidence for the analysis came from the conceptual-understanding test and interviews involving eight students who had been selected purposively. Two students represented each conceptual-understanding indicator.

Tabel 1. Achievement of Student Concept Understanding Indicators

Concept Understanding Indicators	Number of Students Who Meet the Requirements	Percentage

Explaining the concept	32 students	100%
Distinguishing concepts	28 students	87%
Applying the concept	26 student	81%
Connecting concepts with financial literacy	28 student	87%

The four indicators show that students' understanding of simple and compound interest was not uniform. Some students performed well across the indicators, whereas others continued to encounter difficulties, especially when they had to relate mathematical ideas to financial literacy situations. These findings indicate the importance of providing students with more opportunities to work on contextual problems. Such experiences can help students move beyond obtaining numerical answers toward understanding what the concepts mean and how they can be used in everyday financial situations.

4. CONCLUSIONS

The study indicates that most students demonstrated a good level of conceptual understanding of simple and compound interest within a financial literacy context. Students were generally capable of restating concepts, identifying their characteristics, and applying them to contextual problems. However, several students still faced difficulties when they had to relate mathematical concepts to financial situations and explain the meaning of their calculation results for decision-making. Therefore, the use of financial literacy contexts in mathematics learning may contribute to a deeper and more meaningful development of students' conceptual understanding

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