



Fintech-Based Banking Economics Learning to Improve Students' Understanding of the Modern Financial System

Hatidah

Politeknik Prasetya Mandiri, PSDKU Palembang, Indonesia

Email: hatidah.3719@gmail.com

Abstract: This research aims to analyze the effectiveness of fintech-based banking economics learning in improving students' understanding of the modern financial system. This research is grounded in the gap between conventional banking education in the classroom and the rapid development of the digital finance industry. The research method is a quantitative, one-group pretest–posttest quasi-experimental design. The research subjects were 30 students from the financial management study program. The research instruments include a test of understanding of the modern financial system, a fintech literacy questionnaire, and a learning activity observation sheet. The data analysis used paired-samples t-tests and N-gain tests, along with descriptive analysis of qualitative data. The results showed a significant increase in pretest–posttest scores ($p < 0.05$), with an average N-gain of 0.62, which was in the medium to high range. In addition, observations showed increased student involvement and a positive response to the use of fintech in learning. These findings indicate that fintech-based learning is effective in improving students' cognitive and contextual understanding. This research is expected to serve as a reference for the development of banking economics learning that is more relevant to the needs of the digital financial industry.

Keywords: Fintech, banking economics, student understanding, modern financial system, technology-based learning

Abstrak: Penelitian ini bertujuan untuk menganalisis efektivitas pembelajaran ekonomi perbankan berbasis fintech dalam meningkatkan pemahaman mahasiswa terhadap sistem keuangan modern. Latar belakang penelitian ini didasarkan pada adanya kesenjangan antara pembelajaran perbankan konvensional di kelas dengan perkembangan industri keuangan digital yang semakin pesat. Metode penelitian yang digunakan adalah pendekatan kuantitatif dengan desain quasi-experimental tipe one-group pretest–posttest. Subjek penelitian terdiri dari 30 mahasiswa program studi manajemen keuangan. Instrumen penelitian meliputi tes pemahaman sistem keuangan modern, angket literasi fintech, dan lembar observasi aktivitas pembelajaran. Teknik analisis data menggunakan uji paired sample t-test dan N-gain, serta analisis deskriptif untuk data kualitatif. Hasil penelitian menunjukkan adanya peningkatan signifikan antara nilai pretest dan posttest dengan nilai signifikansi $< 0,05$ dan rata-rata N-gain sebesar 0,62 yang termasuk kategori sedang menuju tinggi. Selain itu, hasil observasi menunjukkan peningkatan keterlibatan mahasiswa dan respons positif terhadap penggunaan fintech dalam pembelajaran. Temuan ini mengindikasikan bahwa pembelajaran berbasis fintech efektif dalam meningkatkan pemahaman mahasiswa secara kognitif dan kontekstual. Penelitian ini diharapkan dapat menjadi referensi dalam pengembangan pembelajaran ekonomi perbankan yang lebih relevan dengan kebutuhan industri keuangan digital.

Kata Kunci: fintech, ekonomi perbankan, pemahaman mahasiswa, sistem keuangan modern, pembelajaran berbasis teknologi

INTRODUCTION

The development of financial technology (fintech) over the past decade has significantly changed the financial system landscape. Services that previously relied on physical interaction are now shifting to digital platforms—from mobile banking and e-wallets to peer-to-peer lending. This change not only shifts how people transact but also establishes a new pattern in financial decision-making. However, in the banking economics classroom, these changes are not always optimally accommodated. Students are still largely introduced to the concept of conventional banking, while the dynamics of the modern financial system are evolving much more rapidly (Arner, Barberis, & Buckley, 2016).

In learning practice, there is a considerable gap between students' conceptual understanding and the reality of the digital finance industry. Students can explain the functions of banks, types of credit, and intermediation mechanisms, but are often unfamiliar with how fintech operates within the same ecosystem. In fact, when asked to analyze services such as digital lending or payment gateways, some students seemed hesitant to associate old concepts with new practices. This situation indicates that existing knowledge is not yet fully relevant to the development of the modern financial system.

The urgency of this research arises from the need to bridge these gaps. The world of work, especially in the financial sector, now demands graduates who not only understand theory but can also adapt to financial technology and innovation. Without the integration of fintech into learning, there is a risk that students will fall behind in understanding the industry's real dynamics. In other words, banking economics learning needs to be adjusted—not only by updating the material, but also by changing the approach to be more contextual and applicable (Gomber et al., 2018).

The connection between this problem and the industry's real needs becomes even clearer when considering the evolving digital banking transformation. Banks no longer stand alone as traditional financial institutions; they are part of a digital ecosystem that includes various fintech innovations. Therefore, understanding the relationship between banking and fintech is an important competency for financial management students. Learning that does not reflect this reality can leave graduates less prepared to face professional challenges.

Although research on fintech has grown rapidly, it has mostly focused on aspects of the industry, such as technology adoption, regulation, or consumer behavior (Lee & Shin, 2018). On the other hand, research in economic education focuses more on learning methods, such as Problem-Based Learning or blended learning, without specifically integrating fintech as learning content. This shows a fairly clear research gap—namely, the lack of studies examining how fintech can be directly integrated into the learning process in banking economics.

In addition, research that comprehensively measures students' understanding of the modern financial system remains relatively limited. Most studies measure financial literacy only generally, without exploring students' ability to connect banking concepts with digital innovation. In fact, this understanding is key to addressing the complexity of the current financial system. Therefore, this study tries to present a more specific and contextual approach to measuring learning outcomes.

Based on this background, this study aims to analyze the effectiveness of fintech-based banking economics learning in improving students' understanding of the modern financial system. In more detail, this study seeks to answer two main questions: (1) how does fintech-based learning affect student understanding, and (2) the extent to which

students can relate the concept of banking with digital finance practices. This question is formulated to explore not only the learning outcomes, but also the depth of students' understanding.

The novelty of this research lies in integrating fintech into the learning content, not merely as additional context. This research not only discusses fintech as an industry phenomenon but also uses it as a medium to build students' understanding of the modern financial system. This approach provides a new perspective in the learning of banking economics, which previously focused more on conventional concepts. (Marsinah Marsinah et al., 2024; Purwanto & Rosyidin, 2024).

On the other hand, this study also offers a more comprehensive measurement approach to student understanding. Not only measuring cognitive outcomes, but also students' ability to connect theory with digital practice. This is important because effective learning should not stop at understanding concepts, but rather encourages students to think critically and contextually in dealing with real problems. (Aisyah et al., 2024; Rosyidin & Purwanto, 2024).

Finally, this research is expected to contribute both theoretically and practically to the development of banking economics learning. Theoretically, this research can enrich the study of technology integration in economic education. (Budiyanto et al., 2024; Novia et al., 2024). In practice, the results of this research are expected to serve as a reference for lecturers in designing learning that is more relevant to the development of the fintech industry. In fact, perhaps—although this sounds a little ambitious—this research could be one of the references in efforts to align financial education with the changing needs of the world of work.

METHODOLOGY

This research methodology is designed to capture two things at once—measurable learning outcomes and the learning process felt in the classroom. The approach used is a quasi-experimental, one-group pretest-posttest design, combined with simple qualitative elements. This design was chosen because it is quite realistic to apply in the context of ongoing lectures, without dividing the class into control and experimental groups. In this way, changes in students' understanding before and after fintech-based learning can be directly observed, although there are certainly limitations in controlling external variables. (Marsinah et al., 2024).

The research subjects are students in the financial management study program taking banking economics courses, with about 30 people per class. The selection was carried out purposively, with the consideration that the students are in a relevant phase to understand the integration between banking and fintech concepts. There is some kind of practical assumption here—they already have a theoretical basis in banking. However, they have not yet been fully exposed to the practical aspects of the digital financial system. (R.A Rodia Fitri Indriani et al., 2024; Ridayani & Purwanto, 2024).

The research procedure is carried out through several stages of learning that are structured, but still flexible in practice. The initial stage begins with an introduction to fintech and its role in the modern financial system. Furthermore, students are invited to simulate using fintech applications, such as mobile banking and digital wallets, to gain hands-on experience. The next stage is case analysis, for example, related to digital loans or electronic transaction risks, which is then discussed in groups. This process ends with a presentation of results and a joint reflection—a part that often opens many new

perspectives.

The research instrument was compiled to comprehensively capture data. The main instrument is a test of understanding of the modern financial system given before and after learning. In addition, a fintech literacy questionnaire is used to assess students' understanding of financial technology concepts and their use of financial technology. Observation sheets are also used to record student activities during the learning process, including participation, interaction, and response to the use of technology. This combination is expected to provide a more complete picture, not only of results but also of processes.

The data analysis technique is carried out in two approaches. Quantitative data were analyzed using a *paired-samples t-test* to assess a significant difference between the pretest and posttest, as well as N-gain analysis to measure the level of improvement in student understanding. Meanwhile, qualitative data from observations were analyzed descriptively to describe changes in student learning behavior during the learning process. This approach allows researchers to see not only "how big the increase" is, but also "how the increase occurred". To clarify the overall design of the methodology, the following is a summary in the form of a table:

Table 1. Research Methodology Design

Research Components	Description
Research Design	One group pretest–posttest + qualitative descriptive
Research Subject	30 financial management students
Learning Procedure	Fintech introduction, application simulation, case analysis, discussion, reflection
Research Instruments	Comprehension test, fintech literacy questionnaire, observation sheet
Quantitative Analysis	Paired sample t-test, N-gain
Qualitative Analysis	Descriptive analysis of student activities and responses

RESULT AND DISCUSSION

Result

The research findings are based directly on data obtained during the learning process, without first engaging in in-depth interpretation. In general, the study's results show that students' understanding of the modern financial system changes after the implementation of fintech-based learning. These changes are reflected in comparisons of pretest and posttest scores, statistical test results, and N-gain values that illustrate the level of improvement in comprehension, as well as in observational findings that show students' involvement in digital learning and their responses to the use of financial technology. These three aspects complement each other—numbers provide quantitative evidence, while observations provide a picture of classroom processes.

Pretest and Posttest Results

The pretest and posttest results provide an initial overview of students' understanding of the modern financial system before and after the implementation of fintech-based learning. In the pretest stage, most students still show limited understanding, especially in

associating the concept of conventional banking with digital financial practices such as mobile banking, e-wallets, and online loan services. The value obtained falls in the low to medium range, indicating that exposure to the previous fintech concept remains suboptimal.

After the fintech-based learning process was carried out, the posttest results showed significant changes. Students are beginning to identify the relationship between traditional banking concepts and digital innovation, as well as to understand better the operational mechanisms of fintech services in the modern financial system. This increase is not only seen in the ability to answer concept-based questions but also in questions that require case analysis, such as evaluating digital transaction risk or understanding online loan flows.

When viewed from the average score, there was a fairly clear increase between the pretest and posttest. The average pretest score is 60, while the average posttest score is 80. This increase shows that understanding has improved, with the improvement quite evenly distributed among students. Despite this, individual variation remains noticeable—some students experience very significant improvements, while others increase gradually. This pattern shows that the learning process is dynamic and not uniform. To clarify the comparison, the following is presented: a table of the distribution of pretest and posttest scores for students:

Table 2. Comparison of Student Comprehension (Pretest and Posttest)

Grade Categories	Pretest	Posttest
High (≥ 80)	4	16
Moderate (65–79)	11	14
Low (< 65)	15	2
Total	30	30
Avarage	60	80

Table 2 shows a clear shift in student understanding from before to after fintech-based learning. At the pretest stage, most students were still in the low category (15), while only 4 reached the high category. However, after the learning, the number of students in the low category dropped sharply to 2, while the number in the high category increased sharply to 16. The medium category also saw a slight increase, indicating that some students moved up gradually. In addition, the increase in the average score from 60 to 80 further confirms that it does not occur only in a specific group but is spread relatively evenly. Overall, this table shows a significant increase in students' understanding of the modern financial system following the integration of fintech into learning.

Improving Student Understanding

The improvement in students' understanding of the modern financial system was analyzed using a quantitative approach, including statistical tests and N-gain calculations. The results of the paired-samples t-test showed a significant difference between the pretest and posttest scores. The significance value (Sig. 2-tailed) was below 0.05, indicating that fintech-based learning has a real influence on improving student understanding. In other words, the changes that occur are not accidental but the result of the learning treatment.

When viewed in terms of the average score difference, the increase was also quite striking. The average student score increased from 60 on the pretest to 80 on the posttest, a difference of 20 points. This increase shows that students are not only gaining additional knowledge but also experiencing progress in understanding the relationship between banking concepts and the digital financial system. However, the rate of improvement for each individual is not the same—some increase significantly, while others increase gradually.

In addition to statistical tests, N-gain analysis is used to determine the level of effectiveness of improving student understanding. The calculation results show that the average N-gain is 0.62, which falls within the medium to high category. This shows that fintech-based learning is quite effective in improving students' understanding of the modern financial system. Some students even achieve the high N-gain category, indicating they can absorb and apply learning materials effectively. To clarify the results of the analysis, the following table of statistical test results and N-gain values is presented:

Table 3. Statistical Test Results and N-Gain

Indicator	Score	Remarks
Average Pretest	60	
Average Posttest	80	
Average Difference	20	There is an increase
Sig. (2-tailed)	0,000	Significance (< 0,05)
Average N-Gain	0,62	Medium-High Category

Table 2 shows that student understanding improves clearly and measurably after the implementation of fintech-based learning. The increase in the average score from 60 to 80, with a difference of 20 points, reflects a fairly strong development of ability. The results of the statistical test, with a significance value of 0.000 (< 0.05), indicated that the increase was significant, not a mere coincidence. Meanwhile, the average N-gain value of 0.62, which is in the medium to high category, indicates that learning effectiveness is good at improving student understanding. Overall, this data provides a consistent picture that the integration of fintech into learning can encourage an optimal increase in understanding of the modern financial system.

Observational Findings

Observation findings during the learning process indicate that changes in student involvement are quite noticeable when fintech-based approaches are implemented. In the early stages, some students still tend to be passive and wait longer for the lecturer's direction. The interaction was also limited to simple questions, not to in-depth discussions. However, when learning began to involve simulating the use of applications such as mobile banking and digital wallets, the classroom atmosphere slowly changed. Students seem more curious—they try, click, and even compare the features of one app with another.

As learning progresses, student involvement is increasing, especially in group discussion activities. Students not only follow the instructions but also begin actively exploring the given cases, such as digital loan analysis or the security of electronic transactions. Discussions become more lively, although sometimes not fully structured. There are small moments—for example, when students argue with each other about the

risks of fintech lending—that actually show that they are starting to think critically. Something like this, though simple, is actually an important indicator in the learning process.

Student responses to the use of fintech as a learning medium are also generally positive. They feel that learning is becoming more relevant to daily life, as most are familiar with digital financial applications. However, some students also initially have difficulty, especially with understanding certain terms or mechanisms in fintech. Interestingly, this difficulty actually becomes the starting point for a deeper discussion—as if the confusion becomes shared learning material. To strengthen the findings of these observations, the following are some of the results of interviews with students:

"Previously, I only knew about mobile banking for transfers, but after this learning, I have a better understanding of how the system works and what the risks are."

"Learning using a live app is different, easier to understand than just the theory in a book."

If you look at the interview excerpt, you can see that students have experienced a fairly fundamental change in their understanding of the concept of the digital financial system. Initially, the use of applications such as mobile banking was understood only as a practical function—for example, for transfers—without a clear understanding of the underlying mechanism. However, after fintech-based learning, students can see the relationship between technology and the financial system more broadly, including the risks and how the service works. This shows that learning not only adds knowledge but also deepens students' understanding of the realities of modern finance.

On the other hand, interviews also show that students' learning experiences have become more active and meaningful. Students feel that practice-based learning and group discussions make the material easier to understand than just through theory. Although there is confusion about fintech terms and concepts at first, the group's interactions help them overcome these difficulties. In addition, the emergence of a feeling that learning is becoming more interesting and relevant to daily life indicates an increase in motivation to learn. So, this approach not only affects cognitive aspects but also student engagement and learning attitudes.

Discussion

This discussion section shows that the research results do not stand alone but rather reinforce one another to form a complete pattern. In general, there are three main findings: a significant increase in student understanding as indicated by pretest and posttest results; results of statistical tests and N-gain values that show the effectiveness of learning in the medium to high category; and changes in student involvement in the digital learning process. These three findings show that fintech-based learning not only affects learning outcomes but also the learning process itself. (Hidayad et al., 2024; Yuliana et al., 2024). These changes reflect a shift from passive to more active, context-based learning, in line with the characteristics of technology-based learning in modern education (Gomber et al., 2018).

In addition, the results of observations and interviews reinforce the importance

of direct experience with fintech applications in improving students' understanding. When students not only read concepts but also interact directly with the digital financial system, they tend to understand the relationship between theory and practice more easily. This aligns with the view that experiential learning can increase engagement and deepen understanding, especially in the context of financial technology that continues to evolve (Croitoru et al., 2025). In other words, learning becomes more meaningful when students experience the process of learning for themselves (Fitria Marisyia et al., 2024; Purwanto et al., 2024).

Compared with previous research, this study's results align with the importance of fintech literacy in higher education. Several studies show that students' understanding of fintech remains limited, especially of the complex digital financial ecosystem (Ali et al., 2024). This condition is in line with the initial findings in this study, where students still have difficulty associating the concept of banking with fintech practices before learning interventions are carried out (Purwanto, Yuliana, et al., 2025).

However, this study also makes a different contribution compared to previous research. Most previous studies have placed fintech as an object of study or learning material, rather than as a learning approach itself. This research actually integrates fintech as a learning medium and context, so that students not only learn the concept, but also experience its use directly. This approach expands the perspective of financial economics learning, which was previously more theoretical, to be more applicable and contextual (Poon et al., 2024).

The results of this study indicate that the effectiveness of fintech-based learning lies in its ability to connect theory and practice directly. When students are faced with simulations and real-world cases, they are encouraged to think critically and analytically to understand the modern financial system. (Fitria Marisyia et al., 2025). This process aligns with constructivist theory, which holds that knowledge is built through experience and active engagement with the learning environment (Arner et al., 2016). Thus, the increase in understanding is not just the result of information transfer, but of a deeper knowledge construction.

The implications of this study show that integrating fintech into banking economics learning can be an effective strategy to increase the relevance of education to industry needs. Technology-based learning not only improves students' digital financial literacy but also prepares them to navigate the increasingly complex dynamics of the modern financial system. (Purwanto, Yuliasri, et al., 2025). This aligns with research emphasizing the importance of integrating technology into higher education to enhance graduates' job-readiness (Gomber et al., 2018).

However, several challenges need to be considered in implementing fintech-based learning. One of them is the difference in students' digital literacy levels, which can affect learning effectiveness. In addition, limited access to technology and infrastructure is also an obstacle that needs to be considered. (Dita Rahmawati et al., 2026). These challenges show that the success of fintech-based learning depends not only on methods but also on the readiness of the learning environment (Ali et al., 2024).

In the future, this research can be further developed by integrating leadership and communication skills into the context of fintech learning. In the modern world of finance, analytical skills need to be supported by the ability to communicate decisions effectively and work in a team. Therefore, further research can explore how fintech-based learning can improve students' financial leadership and professional

communication skills. This approach is expected to produce graduates who are not only technically competent but also have strong leadership abilities to address the challenges of the digital finance industry (Croitoru et al., 2025).

CONCLUSION

The conclusion of this study shows that fintech-based banking economics learning has a positive impact on increasing students' understanding of the modern financial system. The increase is not only reflected in quantitative measurements, such as pretest and posttest scores that show significant differences, but also in changes in how students understand concepts and relate them to digital finance practices. Students become better able to interpret fintech services, understand digital transaction mechanisms, and connect conventional banking concepts with developing technological innovations. On the other hand, student engagement in the learning process has also increased, indicating that this approach is not only cognitively effective but also capable of creating more meaningful learning experiences.

Based on these findings, it is suggested that future development of banking economics learning will further integrate digital media, especially those related to fintech, so that the material presented is more relevant to industry needs. In addition, further research can expand the study by adding other variables such as digital literacy, self-confidence, or financial communication skills to get a more comprehensive picture. The use of more complex research designs and wider sample coverage may also be considered to improve the validity and generalization of research results. Thus, fintech-based learning is expected to continue to be developed as an innovative approach in financial economics education.

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