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Project-Based Learning to Improve Financial Literacy in the Digital Era for Vocational School Students

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Abstract : This study aims to analyze the effectiveness of project-based learning in improving the financial literacy of vocational school students in the digital era. The research method used is a qualitative approach with a case study design, where data is collected through in-depth interviews, participatory observations, and documentation analysis related to the implementation of project-based learning in financial literacy learning. The research participants consisted of vocational school students who were directly involved in finance-based learning projects, teachers of economics or finance subjects, and financial education experts. The data analysis process is carried out through data reduction techniques, data presentation, and conclusion drawing to identify patterns in students' understanding of financial management concepts in the digital context. The results of the study show that the application of project-based learning increases students' involvement in learning as well as their ability to manage personal finances more wisely. The contribution of this research is to provide insights for educators and policymakers in designing innovative learning strategies that are more contextual to the development of the digital era.

Keywords: Digital era, Financial, literacy, education, Project-based.

1. INTRODUCTION

Financial literacy is an essential skill for vocational school students in facing economic challenges in the digital era. The ability to manage finances well will help students make wise financial decisions, especially with the growing digital-based financial system. Digital financial literacy is a fundamental prerequisite for prudent financial conduct, encompassing regulated expenditure and systematic saving (Apreal Marjorie Bisquera Silva et al., 2024). Learners exhibiting elevated levels of literacy demonstrate greater proficiency in utilizing digital financial instruments, thereby augmenting their financial management skills (Apreal Marjorie Bisquera Silva et al., 2024). Educational programs designed to enhance financial competency have yielded favourable results, with participants indicating an augmented comprehension of financial management after the training (Bachtiar et al., 2022). Initiatives that integrate experiential financial management strategies are efficacious in equipping students for autonomous financial decision-making (Bachtiar et al., 2022). Many students today are already using digital wallets and online banking services, but still struggle to understand financial management concepts such as budgeting, investments, and savings. In that arena, improving financial literacy is very necessary so that vocational school students can make optimal use of financial technology and avoid uncontrolled financial risks.

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Project-based learning (PBL) is an effective learning method for improving the financial literacy of vocational school students. PBL allows students to learn through hands-on experience by working on projects that are relevant to daily life so that their understanding of financial concepts becomes more in-depth. Students engage in projects that simulate authentic financial consulting scenarios, resulting in heightened levels of motivation and commitment (Abinzano et al., 2024). Problem-based learning (PBL) fosters essential competencies such as collaboration, professional ethics, and critical analytical skills, which are crucial within the finance sector (Abinzano et al., 2022). Research indicates notable enhancements in student academic performance and comprehension after the adoption of PBL, thereby underscoring its efficacy in finance education (Mustika et al., 2024). Students generate advisory documentation, enabling them to translate theoretical frameworks into practical applications, thus facilitating the integration of theory with practice (Abinzano et al., 2022). The systematic methodology of PBL encompasses the articulation of objectives, the implementation of projects, and the evaluation of outcomes, which collectively augment knowledge retention and practical application (Linh, 2024). Students who are given a project to create a personal finance budget or digital investment simulation will have a better understanding of how to manage money than just learning theory from textbooks. With this approach, students not only understand financial concepts theoretically but also have practical skills that can be applied in real life.

The application of PBL in financial education has been proven to significantly increase the understanding of vocational school students. Through experiential projects, students can learn independently, collaborate, and solve financial problems faced in daily life. Financial education furnishes students with the requisite knowledge and competencies essential for making informed financial decisions, thereby fostering a constructive relationship with monetary resources (Martins & Fonseca, 2021). It addresses the deficiencies in comprehension of mathematical principles and their practical implications, thereby equipping students to confront real-world financial adversities (De Souza et al., 2024). Proposed projects may encompass activities such as overseeing a simulated economy or facilitating financial literacy workshops, which serve to reinforce theoretical constructs through experiential learning (Estevão, 2023). Such initiatives have demonstrated favourable outcomes, encouraging students to embrace proactive approaches towards financial education (Estevão, 2023).Studi kasus di beberapa sekolah menunjukkan bahwa siswa yang belajar dengan metode PBL are better able to make financial planning, manage expenses, and understand the concepts of loans and investments compared to students who only learn through lectures. Thus, PBL can be a

strategic solution in increasing financial literacy among vocational school students and preparing them to face future economic challenges.

The integration of PBL in the financial education curriculum in vocational schools needs to be considered as a strategic policy. With a project-based approach, students not only gain a theoretical understanding but are also able to apply financial concepts in a variety of real-life situations. Students construct three-statement financial models, thereby augmenting their financial literacy and enhancing their decision-making capabilities within engineering contexts (Lynch et al., 2024). Project-based learning (PBL) cultivates students' competencies in stock trading, facilitating the application of both fundamental and technical analysis within a simulated trading environment (Kartika & Rahman, 2022). The transformation of classrooms into financial consulting firms empowers students to offer guidance on investment strategies, thereby reinforcing the practical application of their financial acumen (Abinzano et al., 2022). PBL motivates students to discern and exploit interdisciplinary connections, thereby enriching their overall educational experience (Lynch et al., 2024). Schools that adopt this method report improved students' skills in managing personal finances and understanding digital financial risks such as online fraud and debt management. Therefore, educational institutions and policymakers need to develop PBL-based programs to increase the effectiveness of financial literacy learning in the digital era.

Although the digital era offers various conveniences in financial management, many vocational school students still have a limited understanding of financial literacy. Financial technologies such as digital wallets, online loans, and app-based investments are gaining popularity, but not all students understand the risks and proper financial management strategies. A research investigation has demonstrated that the financial literacy levels of students are predominantly at an intermediate stage, which corresponds with their financial management practices being only at a moderate level (Juliyanti et al., 2023). Financial technology exerts a beneficial influence on financial management practices; however, in the absence of sufficient financial literacy, students are at risk of making detrimental financial choices (Fadiyah & Widodo, 2024). The proliferation of digital financial services has rendered students vulnerable to online security threats, thereby underscoring the imperative for digital financial literacy to safeguard against possible adverse effects (Li & Fisher, 2022). Initiatives designed to inform students regarding the hazards associated with online lending and gambling have evidenced notable enhancements in both awareness and attitudes towards these perils (Umuri et al., 2024). Some vocational school students are easily tempted to make digital transactions without considering the long-term consequences, such as consumptive debt due to the increasingly

prevalent buy now, pay later (BNPL) service. Therefore, it is important to develop a learning approach that not only introduces financial concepts but also equips students with good analytical and decision-making skills in the digital financial ecosystem.

One of the approaches that has not been widely applied in financial education at vocational schools is project-based learning (PBL). PBL emphasizes project-based learning experiences that allow students to understand financial concepts more applicatively compared to lecture or memorization methods. PBL initiatives, exemplified by the formulation of financial models, substantially augment students' financial acumen by necessitating the application of theoretical principles to practical contexts ((Lynch et al., 2024). Students have indicated a marked increase in self-efficacy regarding the management of intricate financial responsibilities, reflecting a more profound comprehension of financial theories (Lynch et al., 2024). PBL fosters the cultivation of vital competencies such as collaboration, self-direction, and analytical problem-solving, which are indispensable within the finance industry (Abinzano et al., 2022). Participation in projects that emulate financial consulting firms enables students to refine their advisory skills concerning investments, thereby bolstering their practical expertise (Abinzano et al., 2022). Instead of just learning theories about investing, students can be given a project to compile a virtual investment portfolio and analyze the movements of the financial markets over a certain period. With this approach, students not only understand financial concepts more deeply but are also able to develop critical skills in dealing with economic challenges in the digital age.

One of the main benefits of implementing PBL in financial education is increased student awareness of digital financial risks. With active involvement in financial projects, students can better understand a range of potential risks, such as online fraud, theft of financial data, or the negative impact of uncontrolled use of credit cards. The proliferation of digital financial services has exposed students to a myriad of online security vulnerabilities, thereby underscoring the imperative for a robust grounding in digital financial literacy (DFL) (Li & Fisher, 2022). DFL augments students' capacity to proficiently navigate online financial instruments securely, consequently diminishing the likelihood of online fraud and data breaches (Li & Fisher, 2022). Students frequently encounter difficulties in the administration of their financial resources, resulting in excessive expenditures. The establishment of financial management frameworks can assist in monitoring expenditures and fostering prudent utilization of credit cards (Azzahra Iskandar et al., 2024). A study in several vocational schools showed that students who participated in PBL-based programs were more wary of fraudulent investment schemes and were more critical in evaluating financial applications than students

who only received theory-based learning. Therefore, integrating PBL into the financial literacy curriculum can be a strategic step to equip students with practical skills in managing financial risk in the digital era.

Although PBL offers various benefits in improving the financial literacy of vocational school students, its implementation still faces various challenges. One of the main obstacles is the lack of resources and readiness of educators to develop projects that are relevant to the needs of students in the digital era. Numerous educators demonstrate a pronounced deficiency in digital competencies, particularly concerning content creation and the integration of technology (Gaur, 2025). Younger educators, frequently possessing less experience, express feelings of inadequacy in effectively employing digital tools (Gaur, 2025). Professional educational programs have the potential to augment teachers' technological proficiency; however, they frequently encounter challenges such as restricted access to technological resources and insufficient follow-up training (Putranti et al., 2024). A structured methodology towards professional development is imperative to rectify these deficiencies and enhance educators' preparedness (Raza & Akhter, 2024). Some schools that are trying to implement PBL face difficulties in providing adequate technological tools as well as limitations in learning modules that are appropriate to the context of financial digitalization. Therefore, support from various stakeholders, including schools, the government, and the financial industry, is needed to ensure that PBL can be effectively implemented in improving the financial literacy of vocational school students in the digital era.

Financial literacy is an essential skill for vocational school students in facing economic challenges in the digital era, but there are still many students who have a low understanding of personal financial management. Digital transformation has changed the pattern of financial transactions, with the advent of technologies such as digital wallets, online loans, and app-based investments, which require a better understanding of finance for students to make wise financial decisions. Digital transformation has precipitated the accelerated advancement of FinTech, which encompasses a diverse array of services such as mobile payment systems, peer-to-peer lending platforms, and automated investment advisors, thereby fundamentally reshaping conventional financial methodologies (Siddiqui et al., 2023). Technologies such as artificial intelligence and blockchain have become indispensable components of financial services, augmenting operational efficiency and generating novel opportunities for financial transactions (Kamacı & Güneş, 2024). Financial literacy provides students with critical competencies in budgeting, saving, and investing, which are vital for proficient personal financial management (Taj & Reddy, 2024). Notwithstanding the extensive penetration of

FinTech services, a considerable disparity persists in digital financial literacy, with a substantial number of users inadequately prepared for secure utilization (Гимранова, 2021). Previous studies have shown that many vocational school students are trapped in consumptive behaviours, such as using *buy now*, *pay later* (BNPL) services without understanding the consequences of long-term debt, which risks causing financial problems in the future. Therefore, a more effective and applicable approach to financial education is needed so that students not only understand financial concepts in theory but also have practical skills in managing their finances independently.

Project-based learning (PBL) is a potential approach to improving the financial literacy of vocational school students because it allows them to learn through hands-on and real project-based experiences. This method is more effective compared to conventional learning because it requires students to identify financial problems, design solutions, as well as apply financial concepts in projects that are relevant to daily life. Learners utilize theoretical frameworks in the context of practical scenarios, thereby augmenting their capacity to address intricate financial challenges pertinent to quotidian existence (Linh, 2024; Zhang, 2023). The CFA-TFU model customizes educational experiences to meet the distinct requirements of individual learners, thereby ensuring that all students achieve a robust understanding of financial concepts effectively (Zhang, 2023). Students can be given a project to compile a monthly financial budget, analyze their consumption patterns, or conduct a simple investment simulation using a digital finance app so that they can understand the principles of financial management in more depth. With the PBL approach, students not only gain theoretical understanding but also practical skills that can help them better face the economic challenges of the digital age.

This research aims to explore the effectiveness of project-based learning in improving the financial literacy of vocational school students in the digital era. By understanding how PBL is applied in financial education, this research can provide insight into learning strategies that are more relevant and applicable to vocational school students. Project-Based Learning (PBL) facilitates students' involvement in initiatives that mirror authentic financial situations, thereby augmenting their comprehension of financial management tenets (Arlina et al., 2025). Learners demonstrate heightened motivation and engagement when acquiring knowledge through project-based methods, as they can perceive the pertinence of their academic endeavours (Arlina et al., 2025). The amalgamation of PBL with e-learning can yield a holistic educational experience, enabling students to adeptly navigate the fluctuations of financial markets (Hsieh, 2023). This study will evaluate how students' involvement in finance-based projects can improve their understanding of personal financial management, as well as the

extent to which these methods can help them in the face of modern financial challenges. Thus, this research is expected to contribute to the development of more innovative financial learning models, as well as provide recommendations for schools and policymakers in improving the quality of financial education in vocational schools.

2. METHODS

This study uses a qualitative approach with a case study method to analyze the application of project-based learning (PBL) in improving the financial literacy of vocational school students in the digital era**.** This method was chosen because it allows for an in-depth exploration of students' experiences in the project-based learning process**.** Problem-based learning (PBL) promotes active engagement, compelling students to immerse themselves thoroughly in the subject matter (Asfihana et al., 2022). Collaborative endeavours enhance social competencies and cultivate a sense of belonging among learners (Apeanti & Essel, 2021). Learners indicate a marked enhancement in critical analysis and problem-solving skills as a result of experiential projects (Asfihana et al., 2022; Mutanga, 2024) fosters independence, empowering students to assume responsibility for their educational journey (Turcotte et al., 2022). The transition from conventional pedagogical approaches to PBL may present challenges, with students frequently encountering difficulties in adaptation (Mutanga, 2024). This research highlights how students engage in real-life projects, such as digital business simulations or budget management independently. Thus, this research can comprehensively reveal the effectiveness of PBL in improving students' understanding of financial literacy in the digital era.

The population in this study is students of SMK class XI Tangerang who have received financial literacy materials in their curriculum, while the sample was selected using purposive sampling to ensure active student participation in project-based learning. The sample was selected from two vocational schools with study programs related to finance and business, given their relevance to financial literacy in the digital era**.** Financial literacy empowers proprietors of small and medium-sized enterprises (SMEs) with vital competencies for proficient financial oversight, encompassing budgeting and risk management (Gosal & Nainggolan, 2023). An investigation conducted in Malang revealed that SMEs exhibiting elevated levels of financial literacy manifested considerably enhanced business performance (Satiti, 2020). The implementation of digital financial platforms, such as Mobile Money, has demonstrated the capacity to augment financial literacy and elevate SME performance in Ghana (Frimpong et al., 2022). Educational initiatives designed to enhance digital financial

literacy are crucial for promoting improved financial practices among SME proprietors (Gosal & Nainggolan, 2023). Several students from accounting and digital business majors were involved to observe how they understood financial concepts through PBL. This approach ensures that research results represent student experiences that are relevant to the needs of modern financial education.

The research instruments include in-depth interviews, participatory observations, and document analysis to obtain comprehensive data on the application of PBL in financial education. Interviews were conducted with students and teachers to understand how they are adopting and implementing financial literacy in PBL-based projects. Students exhibited enhanced academic performance and comprehension of financial principles after they participated in Problem-Based Learning (PBL) activities, such as the preparation of advisory reports within finance curricula (Abinzano et al., 2024). PBL has been empirically demonstrated to exert a significant impact on the financial literacy competencies of early childhood learners, with quantitative data substantiating its efficacy in imparting financial management skills from an early developmental stage (Kalsum et al., 2025). Students articulated a strong inclination for a more extensive financial literacy curriculum, underscoring its pertinence to their present and prospective financial circumstances (Guðjónsson et al., 2022). The disparity between theoretical understanding and practical implementation continues to pose a significant challenge. PBL serves to mitigate this disparity by offering experiential learning opportunities that integrate academic knowledge with authentic financial contexts (Singh & Singh, 2024). Students are given a project to create digital financial reports and manage investment simulations, which are then analyzed to see how well they understand the concept of financial literacy. Thus, this procedure ensures that the research obtains valid empirical data and follows the research objectives.

The data obtained was analyzed using thematic analysis techniques, where the main patterns and themes in the application of PBL to the financial literacy of vocational school students in the digital era were identified. This approach allows researchers to categorize the various experiences of students in understanding financial concepts through real projects**.** Students participate in the development of financial models, including income statements and cash flow statements, thereby augmenting their comprehension of financial decision-making within applied contexts (Lynch et al., 2024). The implementation of financial education at a formative age provides students with crucial competencies for prudent financial conduct, thereby equipping them for prospective roles as consumers (Martins & Fonseca, 2021). Empirical studies suggest that project-based learning (PBL) substantially augments financial

literacy competencies during early childhood, as substantiated by a t-value of -16.412 and a significance level of 0.001, thereby affirming its efficacy in imparting financial principles to young learners (Kalsum et al., 2025). The employment of platforms such as the Wharton Research Data Services (WRDS) in experiential learning projects enables students to partake in authentic financial analyses, resulting in enhanced confidence and performance in fiscal tasks (McKee et al., 2025; McKee & Solis, 2025). The analysis showed that students who were involved in digital-based projects, such as e-commerce management or digital financial record-keeping, showed a deeper understanding compared to those who only received the material conventionally. Thus, this analysis provides a clear picture of the impact of PBL on students' financial literacy in the digital era.

3. RESULTS

Table 1. of Summary of Findings

Aspects	Key Findings
Interview	Students feel more comprehensible about financial concepts through real projects, and teachers see increased student engagement.
Observation	Students are more active in discussions, collaboration increases, and critical thinking and problem-solving skills develop.
Documentation	The projects that students produce demonstrate a deeper understanding of financial management and digital investments.
Conclusion	PBL is effective in improving the financial literacy of vocational school students in the digital era by connecting theory to real practice.

The table shows interviews conducted with educators and students have shown that the implementation of project-based learning (PBL) in the realm of financial literacy, especially in the context of the digital era, has indeed facilitated a much more contextual and in-depth learning experience for all participants involved. Educators have articulated that this pedagogical approach actively promotes higher levels of engagement among students, allowing them to foster a deeper understanding of various financial concepts through their involvement in authentic projects, which may include practical tasks such as budget planning exercises and investment simulation activities. Some students have expressed the sentiment that engaging in project-based learning offers them a broader and more nuanced understanding of financial principles compared to traditional lecture-based teaching methods, especially as it relates to important areas such as effective money management and the intricacies of digital investments. In addition, they have reported an increased sense of self-efficacy and confidence in their

ability to make informed financial decisions after they participate in projects based on the PBL framework.

The table shows observations conducted in classroom educational settings reveal that students show significantly increased levels of engagement and participation in discussions and collaborative efforts when they are immersed in the completion of digital finance projects. It seems that students show tremendous enthusiasm for engaging with project-based tasks, which include, but are not limited to, the complex process of compiling detailed digital financial reports and effectively managing complex online business simulations. Subsequently, the role of teachers is transformed into facilitators, where they guide the learning process rather than simply serving as an exclusive source of knowledge and information. The frequency and quality of interactions that occur between students in the designated working groups also showed a marked increase, thus showing that project-based learning (PBL) not only increases financial literacy among students but also fosters the importance of skills in cooperation and problem-solving in the context of the digital age.

The table shows the meticulously compiled comprehensive documentation of the various student-generated projects emphatically demonstrates that students can effectively apply the multifaceted concepts of financial literacy in the various real-world scenarios they may encounter in their daily lives. Among the large number of resulting projects that emerged from this initiative are innovative application-based financial reports, sophisticated digital investment analysis, as well as carefully designed simulations of financial transactions that mimic actual market conditions. In addition, this extensive documentation provides strong evidence that students have developed an enhanced ability to systematically analyze investment risks and opportunities, showing a noticeable improvement when compared to their analytical abilities before their involvement in project-based learning methodologies. The results obtained from these projects serve to reinforce and reinforce the findings obtained from comprehensive interviews and detailed observations, which collectively demonstrate that project-based learning (PBL) significantly assists students in forging strong connections between theoretical knowledge and practical applications in the field of financial management, especially in the context of the rapidly evolving digital age.

The table based on an extensive analysis of qualitative data obtained from a series of carefully conducted interviews, systematic observations, and a thorough examination of relevant documentation, it has been conclusively determined that project-based learning (PBL) plays an important role in improving the financial literacy of students enrolled in vocational high schools, especially in the context of increasingly prevalent digital technology. Not only

do these students gain a comprehensive understanding of fundamental financial principles, but they also demonstrate an exceptional ability to effectively apply these concepts in managing their finances and executing various digital business initiatives related to the contemporary economic landscape. In addition, both educators and learners alike have articulated that this innovative pedagogical approach makes the learning experience much more engaging and directly aligned with the demands of the evolving modern workforce and its associated professional environment.

4. DISCUSSION

Interviews with teachers and students show that project-based learning (PBL) contributes to improving the financial literacy of vocational school students in the digital era**.** The teacher stated that this method makes it easier for students to understand financial concepts through direct experience in digital-based projects**.** Students also feel more enthusiastic and motivated when they are given projects that require them to manage their finances in real life**,** such as creating a personal budget or simulating investments. Interactive simulations facilitate the application of financial principles within a pragmatic framework for students, thereby promoting an enhanced understanding (Kalashnikov et al., 2024). Students possessing practical experience exhibit superior financial practices, including regulated expenditure and consistent saving (Apreal Marjorie Bisquera Silva et al., 2024). Instruction in financial literacy within educational institutions has the potential to enhance overall life quality and alleviate financial anxiety (Fernandes et al., 2024). One of the students revealed that by using digital finance applications in school projects, he is now more aware of the importance of managing expenses and saving**.** These findings show that the interviews confirm the effectiveness of PBL in increasing students' awareness of financial literacy and its application in daily life.

Observations during the learning process show that PBL makes students more active in learning financial literacy in the digital era. Student engagement increases in project-based learning activities, especially when they are given the task of analyzing digital financial statements, budgeting, and evaluating investment risks using technology platforms**.** In addition, students were also seen discussing more often with their groupmates, suggesting improvements in critical thinking and problem-solving skills. Research demonstrates that Problem-Based Learning (PBL) results in significant advancements in critical thinking capabilities, with empirical evidence revealing an increase in the mean score from 47.01 in pre-intervention assessments to 82.67 after the intervention (Kurniawan et al., 2024). Another investigation disclosed a rise in the proportion of students exhibiting high levels of critical thinking skills

from 20% to 68% following the application of PBL methodologies (Филалов et al., 2024). PBL promotes the engagement of students in authentic problem-solving scenarios, thereby augmenting their analytical competencies and decision-making proficiencies (Mabrur et al., 2024). Students conveyed a heightened frequency of dialogues with their peers, signifying an enhancement in collaborative and communicative abilities, which are pivotal for competencies requisite in the 21st century (Rohmah et al., 2020). In one learning session, students who were initially passive became more courageous in expressing their opinions when asked to develop a personal finance strategy for the given case study**.** Thus, this observation strengthens the evidence that PBL can build students' financial literacy skills in a more interactive and applicable manner.

The students' project documentation shows that they can apply the concept of financial literacy in various forms of digital-based output**.** Projects produced by students include digital application-based financial statements, simple investment analyses, and budget plans for personal needs**.** In addition, students also demonstrate an understanding of financial risks and the importance of good money management through documented project outcomes. Student-developed applications, exemplified by initiatives such as the CashCoach project, incorporate interactive components to actively engage users and enhance their financial literacy (Ambacher et al., 2023). These instruments facilitate students in generating precise financial reports, thereby augmenting their comprehension of financial management principles (Anggraeni et al., 2024). Through their involvement in these projects, students acquire the ability to identify and evaluate financial risks, which is paramount for making judicious financial decisions (Sulikah Sulikah et al., 2024). The focus on financial education has been demonstrated to enhance student's overall financial behaviour and management competencies (Sulikah Sulikah et al., 2024). One group of students managed to create a Google Sheets-based budget report that recorded their income and expenses for one month, as well as provide an evaluation of their consumption habits**.** These findings show that through PBL, students can connect financial literacy theory with real implementation using relevant digital tools in the modern era.

Based on interviews, observations, and documentation, project-based learning has proven to be effective in improving the financial literacy of vocational school students in the digital era**.** Students not only gain a theoretical understanding but also experience firsthand how financial management is carried out in daily life. Improving analytical skills, utilizing digital technology, and active interaction in learning are the main indicators of the success of this approach. These methodologies facilitate student participation in fiscal planning, investment strategies, and risk assessment, culminating in an enriched comprehension of

financial tenets (Kalashnikov et al., 2024). Specifically designed for individuals lacking an economic background, these educational offerings augment financial literacy and decision-making competencies, effectively embedding financial acumen within various academic frameworks (Musina, 2024). The Integration of Digital Technologies The amalgamation of information technology within the sphere of financial management education enables students to cultivate competencies in data analytics and information dissemination, which are imperative for contemporary financial operations (Wang, 2022). Customized learning trajectories, established through sophisticated algorithms, empower students to more proficiently grasp and implement financial principles, thus surpassing the efficacy of conventional pedagogical approaches (Wang, 2022). The results of the interviews showed an increase in students' awareness of financial management, observations showed their active involvement in financial discussions and decision-making, while project documentation confirmed that they were able to apply the concepts they had learned in real form. Therefore, PBL is recommended as an innovative and effective learning method in financial education, especially in facing financial literacy challenges in the digital era.

5. CONCLUSION

This study aims to analyze the effectiveness of project-based learning (PBL) in improving the financial literacy of vocational school students in the digital era. Through a project-based approach, students are expected to be able to understand the concept of financial management practically and apply it in daily life. In addition, this study also explores how the use of digital technology in learning can support the improvement of students' financial literacy skills. Thus, this study provides insight into more interactive and applicable learning strategies in financial education at the vocational level. The main contribution of this research is to provide recommendations for innovative learning methods for educators in teaching financial literacy, as well as encouraging the integration of digital technology in the financial education curriculum. In addition, the results of this research can also be the basis for the development of real practice-based financial education policies. However, the limitation of this study lies in the limited scope of the sample in some schools, so further research on a wider scale is needed.

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