

Primary School Mathematics Teachers' Perception toward Financial Literacy and Students' Ability to Make Financial Decisions

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Abstracts

The decline in Malaysian students' mathematical literacy scores and their weaknesses in managing financial-related matters are increasingly concerning. Therefore, this study aims to (i) determine differences in the level of financial literacy among mathematics teachers and students' ability to make financial decisions based on school location, and (ii) examine the relationship between these two variables. This study employed a quantitative survey design involving 265 primary school mathematics teachers serving in the Pontian District, Johor, selected through stratified random sampling. Data were collected through questionnaire administration and analysed inferentially using Statistical Package for the Social Sciences (SPSS) version 27. The findings indicate a significant, positive, and moderate relationship between mathematics teachers' perceived financial literacy and students' ability to make financial decisions, with $r(265) = .467$, as well as significant differences in both variables based on school location. The implications of this study highlight the need to develop comprehensive financial literacy teaching modules and to allocate learning resources and technological access to schools according to their location. Future research is recommended to employ a longitudinal design to examine changes in mathematics teachers' perceptions and students' performance or ability in making financial decisions over time. In conclusion, this study fills a research gap by confirming the relationship between the two variables in the Malaysian context and contributes to the field of primary mathematics education by examining financial literacy.

Keywords: Mathematics Education, Mathematics Teacher, Primary School, Financial Literacy, Financial Decisions, School Location

Introduction

Financial literacy refers to an individual's capacity to comprehend financial planning, implement savings and spending strategies, and manage financial resources and instruments (Cavalcante & Savard, 2022; Kumar, 2021). According to the Organisation for Economic Co-operation and Development (OECD 2020), financial knowledge plays a pivotal role in financial

literacy by ensuring that informed and prudent financial decisions are made. Fundamental mathematical skills, such as counting, estimating, measuring, and pattern recognition, are frequently employed in financial contexts. Therefore, mathematical proficiency and financial literacy are considered closely interrelated across all mathematical domains (Cavalcante & Savard, 2022).

This interrelationship must be framed within the broader social setting of the 21st-century digital economy, where financial decision-making is increasingly abstract and 'cashless.' For primary school students, this transition requires moving beyond procedural arithmetic toward a higher level of mathematical modelling. Theoretically, this study is grounded in Social Cognitive Theory, which posits that students develop financial literacy by observing social models, specifically their mathematics teachers in this case. If teachers perceive financial literacy as a low priority within the mathematics curriculum, it creates a 'hidden curriculum' that negatively impacts students' ability to construct viable financial mental models (Wardat et al., 2022).

According to the 2023 Competency and Literacy Assessment (*Pentaksiran Kompetensi dan Literasi, PKL*) Report, the Ministry of Education (MOE) (2024) observed that the financial domain of the report showed declines of 3.41% for primary schools and 2.67% for secondary schools compared with 2022 achievements. These findings indicate a decline in students' mastery of financial literacy skills, underscoring the urgent need to address this issue. This downward trend is attributed to weak reading and numeracy skills, disadvantaged socioeconomic backgrounds, and limited exposure to school tasks that address financial issues (OECD, 2024a). Furthermore, the existing knowledge gap between financial literacy and financial decision-making contributes to this problem (Merter & Balcioglu, 2025).

Given that these foundational gaps often emerge during the early years of schooling, the emphasis on primary school mathematics educators is paramount. Research demonstrates that core financial habits and 'executive functions' associated with delayed gratification, such as estimating future value and opportunity cost, develop as early as the age of seven (Whitebread & Bingham, 2020). Consequently, addressing the decline in PKL scores requires a closer look at those who deliver the curriculum. Despite Malaysia's integration of financial elements since 2016, a significant research gap remains regarding the Pedagogical Content Knowledge (PCK) of mathematics educators. While the curriculum mandates 'what' to teach, it often ignores the 'how' from a mathematical perception standpoint. There is a lack of evidence on how a mathematics teacher's internal perception of their own financial mathematical competency shapes their readiness to foster student autonomy in decision-making (Wu et al., 2023).

The MOE has integrated financial education elements into Mathematics, Malay Language, and English Language subjects at the primary school level to enhance students' exposure to financial concepts (MOE, 2016). Integrating financial literacy into existing subjects and courses serves to mitigate curricular overload (OECD, 2020). Previous studies indicate that the infusion of financial literacy within mathematics education yields positive outcomes for students (Cavalcante, 2025; Kusumawati et al., 2023; Sagita et al., 2022). Consequently, it was proposed that elements of financial education could be progressively integrated into other subjects at the secondary school level, beginning in 2017 (MOE, 2016).

Banjo et al. (2025) emphasise that mathematics teachers' perceptions play a critical role in determining students' success in mathematics learning. Several studies further suggest that teacher perceptions significantly influence student outcomes in financial literacy (Keohane, 2024; Pease, 2018). For instance, Keohane (2024) found that teacher perceptions and attributes can shape student behaviour. This is because a mathematics teacher's perception of their students directly impacts the students' learning experiences and self-efficacy (Pease, 2018). Furthermore, teacher involvement in financial literacy activities enables them to bridge mathematical concepts and reinforce their own pedagogical content knowledge (Pournara, 2016). Additionally, when teachers maintain high yet reasonable expectations tailored to individual student capabilities, teacher-student rapport is strengthened, and interpersonal conflicts are minimised (Trang & Hansen, 2021).

Financial literacy is a skill that must be nurtured as early as possible to develop children's ability to make prudent financial decisions (Puspa Sari et al., 2023). Early exposure to financial literacy benefits children, as these cognitive processes can influence their decision-making (Frydman & Camerer, 2016). As a result, the daily life challenges they encounter can contribute to their acquisition of knowledge and understanding of financial concepts (OECD, 2020). Experiences acquired in early childhood enable individuals to refine their decision-making abilities as they transition into adolescence and adulthood.

A lack of teachers' knowledge of financial literacy hinders their ability to convey financial concepts effectively to students (Puspa Sari et al., 2023). Findings by De Beckker et al. (2019) also indicate that teachers often lack adequate financial knowledge and positive financial attitudes. This undermines a teacher's self-confidence when delivering financial literacy instruction. This issue is supported by Gold (2016), who demonstrates that, while teachers recognise the value of teaching money-related concepts and skills, they remain uncertain about the standards and expectations students are expected to meet.

Furthermore, the reliance on traditional approaches to deliver learning content hinders student comprehension. Abu Talib et al. (2024) It was observed that mathematics educators face challenges in acquiring instructional competencies owing to their own insufficient preparedness. This lack of confidence and preparedness results in inconsistencies in the delivery of mathematical content (Livy et al., 2023). Consequently, mathematics teachers tend to utilise contextual approaches to convey mathematical concepts, which often present various implementation obstacles (Afni & Hartono, 2020). As a result, instruction becomes less effective and interactive, offering students fewer opportunities to apply financial concepts to daily life.

Research on financial literacy among teachers is frequently conducted within international contexts (Sawatzki & Sullivan 2017; Zulaihati et al. 2020). However, studies specifically examining financial literacy among primary school mathematics teachers in Malaysia remain limited. The central research problem is the 'Functional Mathematics Gap', which highlights the disparity between the formal teaching of financial arithmetic and the development of students' decision-making agency. This issue relates to a significant debate in the social sciences about educational equity. Financial literacy is increasingly seen as a form of 'cultural capital' that can help reduce the wealth gap. If mathematics teachers do not see financial literacy as a means of social mobility, students from lower socioeconomic

backgrounds, who often lack financial socialisation at home, remain at a systematic disadvantage. By examining teacher perceptions, this study contributes to the debate by suggesting that mathematics education plays a key role in promoting social justice, equipping all students with the mathematical skills needed to manage risks in the digital financial world (Xu et al., 2022).

To address this research gap, this study surveyed the financial decision-making abilities of primary school students in Malaysia by school location. The three established research questions are as follows:

1. Are there significant differences in the perception levels of primary school mathematics teachers toward financial literacy across different school locations?
2. Are there significant differences in students' ability to make financial decisions based on school location?
3. What is the relationship between the perception levels of primary school mathematics teachers toward financial literacy and the level of students' ability to make financial decisions?

Literature Review

In the educational context, financial literacy encompasses knowledge, attitudes, and practices (Amagir et al., 2020). Previous studies have defined financial literacy as the knowledge and capability to manage financial matters, measuring a student's awareness, knowledge, skills, attitudes, and habits through the utilisation of available financial resources (Financial Education Network [FEN], 2019; Puspa Sari et al., 2023). These emphasised aspects are consistent with the dimensions of (i) awareness, knowledge, and understanding; (ii) skills and behaviour; and (iii) attitudes, as outlined in the Financial Competence Framework for Children and Youth in the European Union (OECD, 2023). Hence, financial literacy is regarded as a vital indicator of a student's capacity to make prudent financial decisions.

In reality, many students still fail to recognise the function and utility of mathematics in daily life. Although students are found to possess a natural inclination to save money and set aside essential items for future use (Kamber et al., 2024; Santos et al., 2025), they nonetheless have a strong motivation to spend money on recreational activities, such as purchasing toys (Santos et al., 2025). Consequently, adopting a financial literacy approach is an appropriate way to address diverse financial challenges, given that all students have familiarity with financial matters (Attard, 2018). Henderson et al. (2021) maintain that financial literacy education should begin at an early stage, despite the ongoing paucity of research on financial literacy education at the primary school level. This necessity arises because previous studies have found that student behaviours and habits are already formed and have influenced students by the time they are exposed to the financial literacy curriculum in secondary school (Batty et al., 2015). Meanwhile, financial education in schools remains under-emphasised, possibly due to teacher anxiety stemming from a lack of financial education during their tertiary studies (Opletalová, 2015).

Malaysia participated in the PISA 2022 financial literacy assessment, ranking alongside Brazil, Bulgaria, Peru, and Costa Rica; notably, it ranks at the lowest end of this group (OECD, 2024b). Low-performing students in the PISA financial literacy assessment did not reach at least Proficiency Level 2, defined as students who are not yet prepared to make financial

decisions based on their existing financial knowledge (OECD, 2024b). Such unsatisfactory performance may be attributed to mathematics anxiety. Students with mathematics anxiety are at a higher risk of demonstrating poor financial literacy skills, as this anxiety taxes the working memory required to perform calculations involving mathematical concepts (Storozuk & Maloney, 2023).

The PISA 2022 results also indicate that socio-economically advantaged students achieved higher average scores compared to their disadvantaged peers. This suggests that students from higher socio-economic backgrounds have greater opportunities to acquire financial knowledge (OECD, 2024b). A deficiency in financial literacy and numeracy skills prevents students from making sound financial decisions, leading to negative consequences such as excessive borrowing and bankruptcy in future (J. Jayaraman et al., 2018). These outcomes may be attributed to environmental factors, including socio-economic status, the household environment, and the students' understanding of financial concepts (Nolka & Sofianopoulou, 2024; Sagita et al., 2025). Therefore, the performance of Malaysian students in the PISA 2022 financial literacy assessment serves as a warning to stakeholders regarding the financial literacy levels of the current generation. Consequently, stakeholders must develop policies aligned with contemporary (Storozuk & Maloney, 2023). Pragmatic and effective initiatives are thus required to strengthen students' financial literacy and equip them with essential skills and knowledge.

In this regard, Czech et al. (2024) highlight the need to enhance financial literacy, particularly among rural youth. Furthermore, it is suggested that schools offer financial literacy courses to foster responsible behaviour among rural students (Czech et al., 2024). However, teaching styles and formats in rural schools often differ from those in urban schools. As a result, school location determines the content and delivery methods employed by mathematics teachers in the classroom. In rural areas, teachers often teach financial literacy concepts through traditional agricultural transactions, such as home-based savings and the purchase of produce from local suppliers. In contrast, in urban areas, teachers present financial literacy in more complex contexts, such as saving through financial institutions (Barrot et al., 2024). Moreover, the use of differentiated approaches aligned with rural contexts may not be applicable to urban settings, given geographical variations in learning environments (Palinussa et al., 2021). However, these findings contradict Wardat et al. (2022) and Thelagaa and Rosli (2024) who suggest that teaching approaches do not affect student performance in either urban or rural areas. This discrepancy may be due to other school-level factors, such as school administrators' attitudes, which can either facilitate or hinder the implementation of financial literacy (Barrot et al., 2024). Inadequate staff training, insufficient monitoring of financial education, and a shortage of appropriate resources and facilities can also negatively affect both teachers' and students' perceptions of financial literacy (Barrot et al., 2024). Additionally, the absence of financial literacy programmes in school planning further limits both parties' exposure to financial literacy.

Chan and Yung (2018) agree that the knowledge structure possessed by a mathematics teacher can influence their pedagogical application during the instructional process. This is supported by Thelagaa and Rosli (2024) who assert that mathematics teachers must possess sound pedagogical and content knowledge of money to prevent misconceptions among students. Consequently, instructional effectiveness is highly dependent on the competency

of the teaching staff (Atiqah dan Rosli 2020). For example, research by Jala (2024) indicates that teachers who are knowledgeable in asset acquisition, budget planning, and decision-making are more cognisant of the importance of these aspects in financial decision-making.

However, primary school mathematics teachers teaching the topic of money have yet to achieve a robust understanding of the subject matter, as discrepancies exist between specific pedagogical knowledge and teaching experience (Thelagaa & Rosli 2024). Weaknesses in teachers' beliefs and their mastery of pedagogical content knowledge (PCK) adversely affect the teaching and learning process (Zakaria dan Ahmad 2021). Furthermore, teachers with low competency levels and poor conceptual understanding undermine the delivery of financial literacy education (Björklund, 2019). On the contrary, according to Voon and Amran (2021), teachers skilled in conveying financial mathematics concepts can stimulate students' interest and help them apply this knowledge to their daily lives.

Financial Industry Collective Outreach (FINCO) (2023) contends that the earlier a student masters the concept of money, the greater their opportunity to achieve a comprehensive understanding of financial principles. This is because financial literacy is indispensable for effective financial decision-making and has the capacity to influence financial behaviours such as saving, investing, and retirement planning (Lusardi dan Mitchell 2023). In addition, Marchetti et al. (2021) emphasise the importance of introducing financial concepts and skills to children in a structured manner to establish a robust foundation for their financial literacy development.

It becomes essential to understand financial literacy as young people and adolescents encounter financial decision-making scenarios with increasing frequency (Sharif dan Naghavi 2020). As students progress through various life stages, the pocket-money management techniques learned in their school years serve as a foundation for more complex financial responsibilities in adulthood (Alliances for Financial inclusion [AFI] & Central Bank of Malaysia [BNM], 2024). Consequently, financial literacy empowers students to maintain effective control over their financial affairs, protects them from fraud, and provides the confidence to explore new dimensions of the financial landscape. In the long term, financial literacy enables students to make accurate financial decisions to achieve a high quality of life (FEN, 2019) and enhance overall financial well-being (Lusardi & Messy, 2023).

Methodology

Research Design

This study adopts a quantitative approach using a survey design. The researcher adapted questionnaire instruments from Salleh et al. (2020), Davis (2023) and The Consumer Financial Protection Bureau (CFPB) (2018) to collect data regarding teachers' perceptions of financial literacy and students' financial decision-making ability. To ensure content validity, the modified instrument was submitted for review by two subject-matter experts in mathematics and one expert in the Malay language. Furthermore, to ensure instrument reliability, a pilot study was conducted. The Cronbach's alpha coefficient values obtained for (a) mathematics teachers' perceptions of financial literacy and (b) students' financial decision-making ability were .751 and .831, respectively, indicating a high level of instrumental reliability.

Sampling Method

Based on information obtained from the Pontian District Education Office, there are 378 teachers currently teaching mathematics in the district. Thus, the research population was set at 378 mathematics teachers. A stratified random sampling technique was employed to determine the number of teachers according to strata (urban and rural) and to select teachers within each stratum. The purpose of using stratified sampling is to ensure that specific individual characteristics are represented by the respondents, accurately reflecting the actual proportions within the population (Creswell & Creswell, 2018). The population size of mathematics teachers from rural and urban schools is represented by a ratio of 302:76, which simplifies to an approximate proportion of 4:1. Furthermore, a G*Power analysis estimated that a minimum of 205 respondents from the rural group and 51 respondents from the urban group were required. A total of 256 respondents is necessary to achieve the desired statistical power.

Data Analysis

The data collected via the questionnaires were analysed using the Statistical Package for the Social Sciences (SPSS) version 27. Inferential statistical analyses, involving independent samples t-tests and Pearson correlation tests, were utilised to draw conclusions from the data. To address the first and second research questions, independent-samples t-tests were used to determine the difference in the perception levels of primary school mathematics teachers toward financial literacy and students' financial decision-making ability based on school location. To address the third research question, a Pearson correlation test was conducted to determine the relationship between teachers' perceptions of financial literacy and students' financial decision-making ability.

Results and Discussion

The collected data were analysed to address the research questions. The findings were derived from inferential statistical tests, followed by a discussion of each result.

Respondents Demographic

A total of 265 respondents completed the questionnaire. Most were female (197; 74.3%) and served in rural areas (209; 78.9%). The majority held a Bachelor's degree (220; 83%), followed by a Master's (25; 9.4%) and a Diploma (20; 7.5%). No respondents had a Doctor of Philosophy (PhD). In terms of teaching experience, the largest group had 6-10 years (87; 32.8%), followed by 11-15 years (61; 23%), fewer than 5 years (50; 18.9%), and over 20 years (29; 10.9%). Table 1 presents the descriptive analysis of the demographic background of the respondents, such as gender, school location, academic qualification and teaching experience.

Table 1

Demographic data of the Respondents

Variables	Frequency	Percentage (%)
Gender		
Male	68	25.7
Female	197	74.3
School Location		
Urban	56	21.1
Rural	209	78.9
Academic Qualification		
Diploma	20	7.6
Bachelor's Degree	220	83
Master's Degree	25	9.4
Doctor of Philosophy (PhD)	0	0
Teaching Experience		
Fewer than 5 years	50	18.9
6 to 10 years	87	32.8
11 to 15 years	61	23
16 to 20 years	38	14.3
More than 20 years	29	11

Differences in Mathematics Teachers' Perception Toward Financial Literacy Based on Location

The first section of the results addresses the first research question: "Are there significant differences in the perception levels of primary school mathematics teachers toward financial literacy across different school locations?" An independent sample t-test was conducted comparing two groups of mathematics teachers serving in urban and rural schools, respectively. The purpose of this test was to assess disparities in perceptions of financial literacy by school location. Preliminary assumptions were satisfied: the dataset was free of outliers, normally distributed, and met the requirements for homogeneity of variance. The null and alternative hypotheses were formulated as follows:

- H_0 : There is no significant difference in the perception levels of primary school mathematics teachers toward financial literacy based on school location.
- H_a : There is a significant difference in the perception levels of primary school mathematics teachers toward financial literacy based on school location.

Based on Table 2, the null hypothesis is rejected as the result indicates a significant difference in the perception levels of teachers toward financial literacy between the urban and rural groups, with a 95% confidence interval of [.07, .36]. A significant difference in the mean of mathematics teachers' perception toward financial literacy for urban school ($M = 4.095$, $SD = .495$) and rural school ($M = 3.880$, $SD = .472$; $t(263) = 2.985$, $p = .003$). The mean difference of 0.215 indicates that mathematics teachers in urban schools had a higher level of perceived financial literacy than those in rural schools. To determine the magnitude of this difference, Cohen's d effect size was calculated and found to be .45. According to Cohen (1988) criteria, this value indicates a medium effect size between the two groups of teachers from urban and rural areas.

Table 2

Independent Samples T-test Results for Level of Perception of Mathematics Teachers Toward Financial Literacy Based on School Location

School Location	N	M	SD	Mean Difference	df	t	p
Urban	56	4.095	.495	.215	263	2.985	.003
Rural	209	3.880	.472				

Generally, mathematics teachers in urban schools report higher levels of perceived stress than those in rural schools. This is because mathematics teachers in rural areas have less access to training and support, resulting in lower perceived feasibility of teaching mathematics with integrated financial literacy elements than their urban counterparts (Matías et al., 2025). This is further supported by Karki et al. (2023), who explain that financial literacy training significantly affects individuals' financial literacy levels and economic behaviour, particularly in rural contexts. Meanwhile, Karki et al. emphasise the need to implement structured and inclusive financial literacy training programmes to enhance financial decision-making skills.

Furthermore, differences in perceptions by school location reflect a gap in teachers' professional development. For instance, research by Saini dan Rosli (2021) indicates that low levels of teacher competence and conceptual understanding can undermine the effectiveness of financial literacy instruction. Additionally, De Witte et al. (2020) state that continuous professional development is more effective at enhancing teachers' capability and confidence than one-off training sessions. Consequently, teachers in schools with limited opportunities for continuous professional development exhibit more restricted and less positive perceptions of the value and potential of integrating financial literacy into mathematics teaching and learning.

In addition, disparities in perceptions of financial literacy between urban and rural mathematics teachers may stem from differing considerations when planning lessons that incorporate financial literacy. These variations in considerations are influenced by the degree of access to professional training, instructional resources, administrative support, and exposure to structured financial literacy programmes (Puspa Sari et al., 2023; Said et al., 2022; Thi et al., 2025). This is due to the fact that teaching and learning requirements vary by school location, as mathematics teachers must constantly evaluate factors such as resource availability (Radi & Amran, 2023) and students' readiness and prior knowledge (Clores & Nueva España, 2023; Goyibova et al., 2025) before determining the appropriate mathematical instructional methods to integrate financial literacy.

Consequently, mastery of Technological Pedagogical Content Knowledge (TPACK) is viewed as a means for mathematics teachers to contextualise financial literacy elements within mathematics education without overburdening students, regardless of school location. Furthermore, Priyanda et al. (2025) and Wu et al. (2023) contend that the effective implementation of any instructional element depends on the teacher's ability to meaningfully balance content, pedagogy, and technology. Thus, a more positive perception of financial

literacy is typically more readily formed among urban mathematics teachers, who are supported by various factors than those in rural areas.

The findings of this study align with those Santoso et al. (2016), who reported that families residing in rural areas exhibit lower levels of financial literacy than those in urban areas. However, findings from Deng et al. (2013) and Björklund (2019) indicated that teachers' financial literacy levels did not differ significantly by school location.

Differences in the Level of Students' Ability to Make Financial Decisions Based on School Location

The following section addresses the second research question: "Are there significant differences in students' ability to make financial decisions based on school location?" The independent samples t-test also compared the ability of students from urban and rural schools to make financial decisions. This test was conducted to assess differences in students' ability to make financial decisions by school location. The assumptions were met after the dataset was tested and found to be free of outliers, normally distributed, and compliant with the test of homogeneity. The null and alternative hypotheses were formulated as follows:

H_0 : There is no significant difference in the level of students' ability to make financial decisions based on school location.

H_a : There is a significant difference in the level of students' ability to make financial decisions based on school location.

Based on Table 3, the null hypothesis is rejected. The study's results indicate that there is a significant difference in the level of students' ability to make financial decisions between urban and rural groups, with a 95% confidence interval of [.07, .38]. A significant difference in the mean of mathematics teachers' perception toward financial literacy for urban school ($M = 3.929$, $SD = .548$) and rural school ($M = 3.703$, $SD = .497$; $t(263) = 2.945$, $p = .004$). The mean difference of 0.226 indicates that the level of students' ability to make financial decisions is higher in urban schools than in rural schools. To determine the magnitude of this difference, Cohen's d effect size was calculated and found to be .44. Based on Cohen (1988) standards, this value indicates a medium effect size between the urban and rural groups.

Table 3

Independent Samples T-test Results for The Level of Students' Ability to Make Financial Decisions Based on School Location.

School Location	N	M	SD	Mean Difference	df	t	p
Urban	56	3.929	.548	.226	263	2.945	.004
Rural	209	3.703	.497				

In general, from the perspective of mathematics teachers, students in urban schools demonstrate a higher ability to make financial decisions than their rural counterparts. This disparity arises from differences in access to financial infrastructure, parental socio-economic status, and opportunities to acquire financial knowledge and literacy (Gremi et al., 2025). This

difference aligns with the arguments of Cattaneo et al. (2022), who assert that the urban–rural gap persists due to inequalities in educational resources, school infrastructure, teacher training quality, and policy support. Schools in rural areas frequently face constraints, including shortages of instructional materials, limited professional training opportunities, and limited access to financial education. These conditions create a learning access gap that directly impairs students' ability to practice financial decision-making skills in authentic learning situations. This explanation is further reinforced by Beteille et al. (2020), who reported that superior infrastructure in urban schools facilitates a productive learning environment, thereby enhancing the effectiveness of financial education.

Beyond physical facilities, teaching staff engagement also contributes to the financial performance gap between these locations. Research by Crawford dan Pugatch (2021) and Evans dan Mendez Acosta (2023) indicate that teachers are more likely to work in urban schools, making it difficult for rural schools to retain skilled educators. This has direct implications for pedagogical quality, particularly in problem-based activities and financial simulations, which are essential elements for training students to make informed decisions. Therefore, urban schools possess various factors that enhance students' ability to make financial decisions compared with rural schools.

Furthermore, differences in students' ability to make financial decisions across locations can be explained from a household finance perspective. Xu et al. (2022) report that access to financial information, exposure to financial products, and parental education levels create disparities in financial literacy and behaviour between urban and rural residents. Indirect exposure at home, such as how parents manage money, make purchases, or plan expenditures, shapes students' financial observations and habits from an early age. For example, in urban areas, financial literacy behaviours often include owning bank accounts, participating in investment activities, purchasing insurance, and using credit cards. However, in rural areas, students' financial literacy behaviours are often constrained by limited access to financial products, low rates of information dissemination, and low awareness. Meanwhile, the OECD (2024b) reports that students in urban schools are more exposed to financial environments, including banks, financial products, and advertisements for such products. This exposure indirectly provides students with an early understanding of risk, choice, and financial implications. In fact, PISA 2022 results show that the gap between urban and rural students across OECD countries persists even after controlling for socioeconomic factors. Consequently, the proposed constraints lead to information asymmetry, which hinders students' ability to interpret financial information Oliver et al. (2022) and adversely affects their ability to make financial decisions.

Furthermore, family factors are likely to contribute to disparities in students' financial decision-making ability by school location. Research indicates that high-income adults tend to exhibit higher levels of financial literacy than low-income groups in both developed and developing nations (Klapper & Lusardi, 2020). This relationship clearly demonstrates that parental financial literacy levels provide a foundation for financial socialisation within the family, which, in turn, influences how students learn to manage money through guidance, advice, observation, and lived experience. Additionally, Guo et al. (2023) and Li et al. (2020) explain that families with high levels of financial literacy can enhance opportunities for household members (students) to make rational decisions regarding credit, savings, and risk.

This knowledge transfer process is effective when adults' (parents') financial literacy is high, thereby improving students' financial decision-making.

In the context of primary school students, early exposure to financial literacy at home helps them build a foundation of financial thinking and skills through daily observations and experiences, such as managing pocket money, distinguishing between needs and wants, and comparing prices before purchasing. This exposure provides an initial experience that shapes rational, evidence-based decision-making behaviour, rather than purely impulsive or emotional responses. Therefore, the findings of this study indicate that school location is a significant variable in determining the level of students' ability to make financial decisions. This is because errors in assessing an individual's level of financial knowledge remain a persistent barrier that often hinders the development of sound financial literacy behaviour, ultimately affecting financial decision-making ability (Merter & Balcioğlu 2025).

Finally, the findings of this study align with the view that financial literacy levels are influenced by a combination of educational factors, household status, local socio-economics, and the school curriculum (Garg & Singh 2018; Saini & Rosli 2021). Additionally, this study shows a significant difference in the level of students' ability to make financial decisions based on school location, consistent with previous findings by Ali et al. (2016), Loh et al. (2019) and Mireku et al. (2023). Thus, the location gap is not merely a geographical issue but an indicator of unequal learning opportunities within the education system. Consequently, instructional programmes and professional training that integrate financial literacy into the mathematics curriculum must be developed and implemented, supported by standardised teaching materials accessible across all locations. Systematic, focused, and continuous teacher training serves as a vital intervention to bridge the location gap and ensure that students can make more accurate and prudent financial decisions.

The Relationship between Mathematics Teachers' Perception Toward Financial Literacy and the Level of Students' Ability to Make Financial Decisions

Moreover, this section addresses the third research question: "What is the relationship between the perception levels of primary school mathematics teachers toward financial literacy and the level of students' ability to make financial decisions?" A Pearson correlation test was conducted to determine the relationship between these two variables. Assumptions were met after the dataset was tested and found to be free of outliers, normally distributed, and demonstrated a linear relationship between the variables tested. The null and alternative hypotheses were formulated as follows:

- H₀: There is no significant relationship between the perception levels of primary school mathematics teachers toward financial literacy and the level of students' ability to make financial decisions.
- H_a: There is a significant relationship between the perception levels of primary school mathematics teachers toward financial literacy and the level of students' ability to make financial decisions.

Based on Table 4, the null hypothesis is rejected, and the alternative hypothesis is accepted. It was found that the perception levels of mathematics teachers toward financial literacy have a positive and moderate relationship with the level of students' ability to make

financial decisions, $r(265) = .467, p < .001$. In conclusion, there is a significant relationship between the perception levels of primary school mathematics teachers toward financial literacy and the level of students' ability to make financial decisions.

Table 4

Pearson Correlation Test Results for The Level of Mathematics Teachers' Perception Toward Financial Literacy and The Level of Students' Ability to Make Financial Decisions

		The Level of Mathematics Teachers' Perception Toward Financial Literacy	The Level of Students' Ability to Make Financial Decisions
The Level of Mathematics Teachers' Perception Toward Financial Literacy	<i>(r)</i>	1	.467*
	<i>Sig. (2-tailed)</i>		< .001
	<i>N</i>	265	265
The Level of Students' Ability to Make Financial Decisions	<i>(r)</i>	.467*	1
	<i>Sig. (2-tailed)</i>	< .001	
	<i>N</i>	265	265

* Correlation is significant at .05 level (2 - tailed)

The existence of a significant relationship between the perception levels of mathematics teachers toward financial literacy and the level of students' ability to make financial decisions underscores the pivotal role of teachers in establishing students' foundations in financial skills. In the context of this study, mathematics teachers' perceptions toward financial literacy reflect their tendencies, desires, and readiness to implement mathematics teaching and learning (PdPc) that integrates financial literacy concepts within the classroom. This is because mathematical skills (numeracy) are intrinsically linked to financial literacy (Jayaraman et al., 2018; Villagomez Amezcua & Hidalgo Everardo, 2017). For example, applying basic operations, fractions, decimals, percentages, ratios, and rates constitutes the fundamental numeracy skills required to calculate interest and discounts in transactions. Consequently, students with higher mathematical proficiency tend to exhibit higher levels of financial literacy. Thus, financial literacy is not merely the memorisation of facts; rather, it encompasses the awareness, skills, knowledge, attitudes, and behaviours necessary to make sound financial decisions (Mani, 2022). In this regard, mathematics teachers who hold positive perceptions of financial literacy and a comprehensive understanding of its components are better equipped to deliver related topics in the mathematics classroom through effective pedagogical activities. From a pedagogical perspective, when mathematics teachers embrace the value of financial literacy, they can utilise financial contexts as a medium to reinforce students' mathematical concepts while simultaneously encouraging student engagement in mathematics learning (Attard, 2018). Therefore, the level of mathematics teachers' perception toward financial literacy is considered to have a positive relationship with the level of students' ability to make financial decisions.

Furthermore, previous research suggests that teachers can integrate financial literacy by discussing financial topics related to daily life and through various simulation activities using specimen banknotes (Gold 2022). For instance, through diverse scenarios, students

learn to make financial decisions through role-play approaches supported by graphic materials (Sawatzki, 2016) and gamification (Czech et al., 2024) to solve the problems presented. Consequently, students gain authentic learning experiences that may enhance their understanding, confidence, and subsequent self-efficacy in financial decision-making. However, past studies have reported contradictions in which mathematics teachers fail to clearly perceive the relationship between financial literacy and their students' socioeconomic backgrounds, leading to inconsistent implementation and confusion among educators (Golding, 2020). This issue may stem from a lack of comprehensive understanding of the existing curriculum and a deficiency in professional teacher development training (Compen et al. 2019; Golding 2020). Such discrepancies may also be attributed to other factors, including demographic, socio-economic, psychological, and technological variables (Rehman & Mia, 2024).

The findings of this study underscore the role of mathematics teachers' perceptions of financial literacy in determining the quality of their delivery of mathematical content and financial literacy, thereby producing students proficient in financial decision-making. Nevertheless, positive perceptions alone are insufficient if mathematics teachers still lack training, remain unclear about curriculum requirements, and lack confidence in selecting appropriate instructional strategies within the mathematics classroom. This is because a poor understanding of financial matters is not exclusive to students from low-income families; it also involves students from various other economic backgrounds (J. D. Jayaraman et al., 2018; Scheresberg, 2013). Therefore, mathematics teachers must be more flexible, better prepared, and equipped with knowledge of financial literacy and its delivery methods to address the issues discussed. Additionally, effective financial literacy programmes should include diagnostic components that help teachers identify knowledge gaps among students, thereby enhancing their ability to make prudent financial decisions (Merter & Balcioglu 2025).

As supplementary information, the findings of this study are consistent with prior research indicating a relationship between financial literacy and financial decision-making ability (Attard, 2018; Mani, 2022; Sagita et al., 2022). However, the study by Mani (2022) did not examine the relationship between financial literacy and financial decision-making ability involving both mathematics teachers and students simultaneously in the same study. At the same time, research by Komara & Widyastuti (2018) cautions that a high level of financial literacy does not necessarily guarantee the quality of financial decisions.

Research Implications

Practical implications underscore the need to clarify the scope of the mathematics and financial literacy curriculum. In this regard, a more comprehensive financial literacy instructional module should be developed and delivered by the Ministry of Education, in collaboration with financial institutions, taking into account school location factors. The financial literacy instructional module must include practical financial tasks that link mathematical concepts to finance. Consequently, guided by such a module, mathematics teachers can enhance their self-confidence in planning mathematics lessons; providing authentic tasks can increase students' exposure and experience in making financial decisions (Ozkale & Ozdemir Erdogan, 2020; Sawatzki, 2017). Simultaneously, the allocation of teaching and learning resources, as well as access to technology for schools, must be based on location to ensure consistent and effective teaching practices.

Research Limitations

The findings of this study focus exclusively on the population of primary school mathematics teachers within the surveyed district. Hence, these findings cannot be directly applied or generalised to the entire population of primary school mathematics teachers in Malaysia without further research in a broader context. This is due to the potential influence of cultural factors, school demographics, and socio-economic environments in other locations on the research findings. From a methodological standpoint, as this study employs a purely quantitative survey design, the identified relationships are correlational and do not establish a causal link between teachers' perceptions of financial literacy and students' financial decision-making ability. Furthermore, the scope of this study assesses financial literacy and students' decision-making ability solely from the teachers' perspective, without directly measuring the students' actual understanding. The responses obtained from mathematics teachers carry a risk of inaccuracy due to variations in respondents' levels of understanding and potential bias regarding students' ability to make financial decisions.

Future Recommendations

The researcher suggests that further studies should place greater emphasis on teachers' financial literacy and students' ability to make financial decisions. Future research should employ a longitudinal design to evaluate shifts in teachers' perceptions of financial literacy and to assess students' performance in making financial decisions over time. Measurement and assessment processes should be more holistic, encompassing not only knowledge components but also practical aspects. Furthermore, a mixed-methods approach is strongly recommended to obtain a more comprehensive understanding of the mechanisms of change in both groups of mathematics teachers (urban and rural).

Conclusion

In conclusion, it can be summarised that primary school mathematics teachers in the surveyed district hold positive perceptions of financial literacy and of students' ability to make financial decisions. Mathematics teachers believe that their students are capable of understanding basic financial concepts, verifying information, and making more prudent decisions. Moreover, this study underscores the need for more systematic professional development, the development of comprehensive instructional modules, and support from school administrators to ensure that financial literacy is consistently integrated into mathematics teaching and learning (PdPc). This research contributes to the field of primary school mathematics education, specifically regarding financial literacy, by providing an initial overview of the practical reality of its implementation within the mathematics classroom.

References

- Abu Talib, S., Mohamad Nasri, N., & Sofwan Mahmud, M. (2024). *Transformasi Ke Arah Profesionalisme: Kesiapan Guru Matematik dalam Menghadapi Cabaran Pendidikan*. <https://doi.org/10.17576/ebangi.2024.2103.09>
- Afni, N., & Hartono. (2020). Contextual teaching and learning (CTL) as a strategy to improve students mathematical literacy. *Journal of Physics: Conference Series*, 1581(1). <https://doi.org/10.1088/1742-6596/1581/1/012043>
- Ali, P., Anderson, M., McRae, C., & Ramsey, I. (2016). The Financial Literacy of Young People: Socioeconomic Status, Language Background, and the Rural-urban Chasm. *Australian and International Journal of Rural Education*, 26(1), 54–66. <https://doi.org/10.47381/AIJRE.V26I1.6>
- Atiqah, N., & Rosli, R. (2020). Pengetahuan Isi Kandungan Khusus dan Efikasi Kendiri Guru Sekolah Rendah dalam Pengajaran Topik Pecahan. *Akademika*, 3, 145–154. <https://doi.org/10.17576/akad-2020-90IK3-11>
- Attard, C. (2018). Financial literacy: Mathematics and money improving student engagement. *Australian Primary Mathematics Classroom*, 23(1), 9–1. <https://search.informit.org/doi/10.3316/aeipt.221368>
- Banjo, B. O., Luneta, K., & Rodríguez-Nieto, C. A. (2025). Exploring teachers' perceptions of mathematical connections in the mathematics curriculum and teaching. *Eurasia Journal of Mathematics, Science and Technology Education*, 21(9), em2703. <https://doi.org/10.29333/EJMSTE/16883>
- Barrot, J. S., Gonzales, J. M., Eniego, A. A., Salipande, A. L., & Olegario, M. L. G. (2024). Integrating Financial Literacy into the K-12 Curriculum: Teachers' and School Leaders' Experience. *Asia-Pacific Education Researcher*, 33(1), 17–25. <https://doi.org/10.1007/s40299-022-00704-y>
- Batty, M., Collins, J. M., & Odders-White, E. (2015). Experimental evidence on the effects of financial education on elementary school students' knowledge, behavior, and attitudes. *Journal of Consumer Affairs*, 49(1), 69–96. <https://doi.org/10.1111/joca.12058>
- Beteille, T., Tognatta, N., Riboud, M., Nomura, S., & Ghorpade, Y. (2020). Ready to Learn: Before School, In School, and Beyond School in South Asia. *Ready to Learn: Before School, In School, and Beyond School in South Asia*. <https://doi.org/10.1596/978-1-4648-1327-6>
- Björklund, M. (2019). Teaching Financial Literacy: Competence, Context And Strategies Among Swedish Teachers. *Journal of Social Science Education*, 18(2), 28–48. <https://doi.org/10.4119/jsse-1426>
- Cattaneo, A., Adukia, A., Brown, D. L., Christiaensen, L., Evans, D. K., Haakenstad, A., McMenemy, T., Partridge, M., Vaz, S., & Weiss, D. J. (2022). Economic and social development along the urban–rural continuum: New opportunities to inform policy. *World Development*, 157, 105941. <https://doi.org/10.1016/J.WORLDDEV.2022.105941>
- Cavalcante, A. (2025). Three approaches to financial numeracy education in secondary mathematics textbooks. *International Electronic Journal of Mathematics Education*, 2025(3). <https://doi.org/10.29333/iejme/16079>
- Cavalcante, A., & Savard, A. (2022). Understanding our world in a time of crisis: Mathematics education pedagogy toward financial numeracy. *Journal of Honai Math*, 5(2), 109–126. <https://doi.org/10.30862/jhm.v5i2.261>
- Chan, K. K. H., & Yung, B. H. W. (2018). Developing Pedagogical Content Knowledge for Teaching a New Topic: More Than Teaching Experience and Subject Matter Knowledge.

- Research in Science Education*, 48(2), 233–265. <https://doi.org/10.1007/S11165-016-9567-1/METRICS>
- Clores, L. J., & Nueva España, R. C. (2023). Assessment of Teachers' Instructional Practices: Towards Proposing an Innovative Instructional Model for Teaching-Learning Material in Chemistry. *Journal of Practical Studies in Education*, 4(4), 1–15. <https://doi.org/10.46809/jpse.v4i4.69>
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences (2nd edition)* (Second). Lawrence Erlbaum Associates.
- Compen, B., De Witte, K., & Schelfhout, W. (2019). The role of teacher professional development in financial literacy education: A systematic literature review. In *Educational Research Review* (Vol. 26, pp. 16–31). Elsevier Ltd. <https://doi.org/10.1016/j.edurev.2018.12.001>
- Crawford, L., & Pugatch, T. (2021). Teacher labor markets in developing countries. *The Routledge Handbook of the Economics of Education*, 193–217. <https://doi.org/10.4324/9780429202520-9/TEACHER-LABOR-MARKETS-DEVELOPING-COUNTRIES-1-LEE-CRAWFURD-TODD-PUGATCH>
- Creswell, W. J., & Creswell, J. D. (2018). *Research Design Qualitative, Quantitative and Mixed Methods Approaches Fifth Edition*. SAGE Publications, Inc.
- Czech, K., Ochnio, L., Wielechowski, M., & Zabolotnyy, S. (2024). Financial Literacy: Identification of the Challenges, Needs, and Difficulties among Adults Living in Rural Areas. *Agriculture 2024*, Vol. 14, Page 1705, 14(10), 1705. <https://doi.org/10.3390/AGRICULTURE14101705>
- Davis, C. F. (2023). *Teacher Perceptions Of Financial Literacy 1 From Rags To Riches: Examining Teacher Perceptions Of The Influence Of Financial Literacy On The Psychological Well-Being Of Military-Connected Students In Kindergarten Through Grade Twelve*. Liberty University.
- De Beckker, K., Compen, B., De Bock, D., & Schelfhout, W. (2019). The capabilities of secondary school teachers to provide financial education. *Citizenship, Social and Economics Education*, 18(2), 66–81. <https://doi.org/10.1177/2047173419850152;PAGEGROUP:STRING:PUBLICATION>
- De Witte, K., Holz, O., & De Beckker, K. (2020). *Financial education: Current practices and future challenges*. Waxmann Verlag GMBH. <https://research.ou.nl/en/publications/financial-education-current-practices-and-future-challenges/>
- Deng, H.-T., Chi, L.-C., Teng, N.-Y., Tang, T.-C., & Chen, C.-L. (2013). Influence of Financial Literacy of Teachers on Financial Education Teaching in Elementary Schools. *International Journal of E-Education, e-Business, e-Management and e-Learning*. <https://doi.org/10.7763/IJEEEE.2013.V3.195>
- Evans, D. K., & Mendez Acosta, A. (2023). How to recruit teachers for hard-to-staff schools: A systematic review of evidence from low- and middle-income countries. *Economics of Education Review*, 95. <https://doi.org/10.1016/j.econedurev.2023.102430>
- Financial Education Network. (2019). *Malaysia Strategi Literasi Kewangan Kebangsaan 2019-2023*. Financial Education Network.
- Financial Industry Collective Outreach (FINCO). (2023). *Money SENSE: Malaysian Students' Grasp of Financial Matters*. <https://www.finco.my/wp-content/uploads/2023/08/Money-SENSe-Report.pdf>

- Financial Literacy and Economic Growth: How Eastern Europe Is Doing?, *Economics* ____ (2024). <https://www.afi-global.org/wp-content/uploads/2024/01/Promoting-Financial-Literacy-Case-Study-of-Bank-Negara-Malaysia.pdf>
- Frydman, C., & Camerer, C. F. (2016). The Psychology and Neuroscience of Financial Decision Making. In *Trends in Cognitive Sciences* (Vol. 20, Number 9, pp. 661–675). Elsevier Ltd. <https://doi.org/10.1016/j.tics.2016.07.003>
- Garg, N., & Singh, S. (2018). Financial literacy among youth. In *International Journal of Social Economics* (Vol. 45, Number 1, pp. 173–186). Emerald Group Publishing Ltd. <https://doi.org/10.1108/IJSE-11-2016-0303>
- Gold, L. A. (2016). *Teachers' Perceptions Regarding Financial Literacy in Kindergarten Through Grade 2*. Ohio University.
- Gold, L. A. (2022). Financial literacy in the Ohio K–2 classroom: a mixed methods study. *Education 3-13*, 50(6), 722–736. <https://doi.org/10.1080/03004279.2021.1905018>
- Golding, J. (2020). Mathematics education and financial literacy: A valued but vulnerable symbiosis. *Proceedings of the British Society for Research into Learning Mathematics*, 40(1).
- Goyibova, N., Muslimov, N., Sabirova, G., Kadirova, N., & Samatova, B. (2025). Differentiation approach in education: Tailoring instruction for diverse learner needs. *MethodsX*, 14, 103163. <https://doi.org/10.1016/J.MEX.2025.103163>
- Gremi, E., Çerri, S., Morina, M., Kotollaku, M., Çela, M., & Durmishi, A. (2025). Raising awareness of financial education among youth in the Elbasan region, Albania. In *Multidisciplinary Reviews* (Vol. 8, Number 4). Malque Publishing. <https://doi.org/10.31893/multirev.2025130>
- Guo, Y., Liu, C., Liu, H., Chen, K., & He, D. (2023). Financial Literacy, Borrowing Behavior and Rural Households' Income: Evidence from the Collective Forest Area, China. *Sustainability* 2023, Vol. 15, Page 1153, 15(2), 1153. <https://doi.org/10.3390/SU15021153>
- Henderson, G. E., Beach, P., & Coombs, A. (2021). Financial Literacy Education In Ontario: An Exploratory Study Of Elementary Teachers' Perceptions, Attitudes, And Practices. *Canadian Journal of Education*, 44, 309–336. www.cje-rce.ca
- Jala, C. L. (2024). *Financial Literacy And Retirement Preparedness Of Public-School Teachers: Basis Of Developmental Plan For Retirement*. 26(10), 1122–1137. <https://doi.org/10.5281/zenodo.13968091>
- Jayaraman, J. D., Jambunathan, S., & Counselman, K. (2018). The Connection between Financial Literacy and Numeracy: A Case Study from India. *Numeracy Advancing Education in Quantitative Literacy*, 11(2). <https://doi.org/10.5038/1936-4660.11.2.5>
- Jayaraman, J., Jambunathan, S., & Counselman, K. (2018). *Numeracy Advancing Education in Quantitative Literacy*. 11. <https://doi.org/10.5038/1936-4660.11.2.5>
- Kamber, E., Atance, C. M., Kamawar, D., & Mahy, C. E. V. (2024). Children's saving: A review and proposed ecological framework. *Developmental Review*, 74, 101163. <https://doi.org/10.1016/J.DR.2024.101163>
- Karki, S. K., Andaregie, A., & Takagi, I. (2023). Impact of financial literacy training on the financial decisions of rural households in Nepal. *International Review of Economics* 2023 71:2, 71(2), 149–173. <https://doi.org/10.1007/S12232-023-00438-3>

- Keohane, B. K. (2024). How Do Teacher Perceptions and Biases Affect or Influence Student Behavior. *Journal of Educational Leadership in Action*, 9. <https://doi.org/https://doi.org/10.62608/2164-1102.1147>
- Klapper, L., & Lusardi, A. (2020). Financial literacy and financial resilience: Evidence from around the world. *Financial Management*, 49(3), 589–614. <https://doi.org/10.1111/FIMA.12283>;PAGEGROUP:STRING:PUBLICATION
- Komara, R., & Widyastuti, A. (2018). Does Financial Literacy Impact Financial Decision Making Among The Government Employee. *Journal of Contemporary Accounting and Economics Symposium 2018 on Special Session for Indonesian Study*, 174–184.
- KPM. (2016). *Panduan Pelaksanaan Pendidikan-Kewangan*. Kementerian Pendidikan Malaysia.
- KPM. (2024). *Pelan Pembangunan Pendidikan Malaysia 2013-2025 Laporan Tahunan 2023*. www.moe.gov.my
- Kumar, M. (2021). Financial Literacy among the Academicians: A Study of Haryana. *Turkish Online Journal of Qualitative Inquiry (TOJQI)*, 12(9), 195–209.
- Kusumawati, I. B., Fachrudin, A. D., Indra Putri, R. I., & Zulkardi. (2023). Infusing Islamic financial literacy in mathematics education for Islamic school. *Journal on Mathematics Education*, 14(1), 19–34. <https://doi.org/10.22342/JME.V14I1.PP19-34>
- Lancian, J. I., Arak, P. M., & Susada, M. D. (2024). Financial Literacy Of Teachers: A Quantitative Study. *IJARIE*, 10(5), 2024. www.ijarie.com
- Li, J., Li, Q., & Wei, X. (2020). Financial literacy, household portfolio choice and investment return. *Pacific Basin Finance Journal*, 62. <https://doi.org/10.1016/j.pacfin.2020.101370>
- Livy, S., Muir, T., Trakulphadetkrai, N. V., & Larkin, K. (2023). Australian primary school teachers' perceived barriers to and enablers for the integration of children's literature in mathematics teaching and learning. *Journal of Mathematics Teacher Education*, 26(1), 5–26. <https://doi.org/10.1007/S10857-021-09517-0/TABLES/3>
- Loh, A. M., Peong, K. K., & Peong, K. P. (2019). Determinants of Personal Financial Literacy among Young Adults in Malaysian Accounting Firms. *GATR Global Journal of Business Social Sciences Review*, 7(1), 8–19. [https://doi.org/10.35609/GJBSSR.2019.7.1\(2\)](https://doi.org/10.35609/GJBSSR.2019.7.1(2))
- Lusardi, A., & Messy, F.-A. (2023). The importance of financial literacy and its impact on financial wellbeing. *Journal of Financial Literacy and Wellbeing*, 1(1), 1–11. <https://doi.org/10.1017/flw.2023.8>
- Lusardi, A., & Mitchell, O. S. (2023). The Importance of Financial Literacy: Opening a New Field. *Journal of Economic Perspectives*, 37(4), 137–154. <https://doi.org/10.1257/jep.37.4.137>
- Mani, M. (2022). Financial Inclusion Through Financial Literacy: Evidence, Policies, and Practices. *International Journal of Social Ecology and Sustainable Development (IJSESD)*, 13(1). <https://doi.org/10.4018/IJSESD.2022010102>
- Marchetti, A., Rinaldi, T., Lombardi, E., Massaro, D., & Valle, A. (2021). Learning to wait, be altruistic, and fair: A primary school training in economic education. *Financial Education and Risk Literacy*, 112–122. <https://doi.org/10.4337/9781789908855.00014>
- Matías, B.-V., Danilo, D.-L., & Jael, O.-M. (2025). Teaching mathematics in rural schools: Asystematic review of classroom implementations. *Multidisciplinary Reviews*. <https://doi.org/https://doi.org/10.31893/multirev.2026140>
- Merter, A. K., & Balcıoğlu, Y. S. (2025). Financial literacy and decision-making: The impact of knowledge gaps on financial outcomes. *Borsa Istanbul Review*, 25, 101–108. <https://doi.org/10.1016/J.BIR.2025.07.010>

- Mireku, K., Appiah, F., & Agana, J. A. (2023). Is there a link between financial literacy and financial behaviour? *Cogent Economics & Finance*, 11(1). <https://doi.org/10.1080/23322039.2023.2188712>
- Nolka, E., & Sofianopoulou, C. (2024). *SOCIO-ECONOMIC STATUS AND STUDENTS' MATHEMATICAL LITERACY ABILITIES*. <https://doi.org/10.36315/2024v1end031>
- OECD. (2020). *PISA 2018 Results (Volume IV)*. OECD. <https://doi.org/10.1787/48ebd1ba-en>
- OECD. (2023). *Financial Competence Framework For Children And Youth In The European Union*. [Publications Office of the European Union]. <https://doi.org/10.2874/297346>
- OECD. (2024a). *PISA 2022 Results (Volume IV): How Financially Smart Are Students? PISA, PISA*. <https://doi.org/10.1787/5A849C2A-EN>
- OECD. (2024b). *Shaping Students' Financial Literacy: The Role of Parents and Socio-Economic Backgrounds*.
- Oliver, A. G., Campbell, R., Graffin, S., & Bundy, J. (2022). Media Coverage of Earnings Announcements: How Newsworthiness Shapes Media Volume and Tone. *Journal of Management*. <https://doi.org/10.1177/01492063221080125;ISSUE:ISSUE:DOI>
- Opletalová, A. (2015). Financial Education and Financial Literacy in the Czech Education System. *Procedia - Social and Behavioral Sciences*, 171, 1176–1184. <https://doi.org/10.1016/J.SBSPRO.2015.01.229>
- Ozkale, A., & Ozdemir Erdogan, E. (2020). A Conceptual Model for the Interaction of Mathematical and Financial Literacies. *International Journal of Progressive Education*, 16(5), 288–304. <https://doi.org/10.29329/ijpe.2020.277.18>
- Pahlevan Sharif, S., & Naghavi, N. (2020). Family financial socialization, financial information seeking behavior and financial literacy among youth. *Asia-Pacific Journal of Business Administration*, 12(2), 163–181. <https://doi.org/10.1108/APJBA-09-2019-0196>
- Palinussa, A. L., Molle, J. S., & Gaspersz, M. (2021). Realistic mathematics education: Mathematical reasoning and communication skills in rural contexts. *International Journal of Evaluation and Research in Education (IJERE)*, 10(2), 522–534. <https://doi.org/10.11591/ijere.v10i2.20640>
- Pease, S. K. (2018). *Success for Every Child: The Impact of Teacher Perceptions on Student Achievement* (87). <https://openriver.winona.edu/counseloreducationcapstones>
- Pournara, -. (2016). Deepening pre-service secondary teachers' mathematical content knowledge through engaging with peers' mathematical contributions. *Perspectives in Education*, 34(1), 135–149. <https://doi.org/10.38140/PIE.V34I1.1948>
- Priyanda, R., Herman, T., Amalia, R., & Ihsan, I. R. (2025). Exploring teachers' pedagogical reasoning in mathematics education using the TPACK framework. *Frontiers in Education*, 10, 1552760. <https://doi.org/10.3389/FEDUC.2025.1552760/BIBTEX>
- Puspa Sari, E. F., Zulkardi, Indra Putri, R. I., & Darmawijoyo. (2023). Mosharafa: Jurnal Pendidikan Matematika Math Teachers' Perceptions Regarding Financial Literacy. *Jurnal Pendidikan Matematika, 12(2)*. <http://journal.institutpendidikan.ac.id/index.php/mosharafa>
- Radi, N. H., & Amran, S. (2023). Strategi dan Cabaran Pelaksanaan Pendekatan Pembelajaran Terbeza dalam Kalangan Guru di Sekolah Rendah. *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, 8(5), e002336. <https://doi.org/10.47405/MJSSH.V8I5.2336>
- Rehman, K., & Mia, M. A. (2024). Determinants Of Financial Literacy: A Systematic Review And Future Research Directions. *Future Business Journal*, 10(1). <https://doi.org/10.1186/s43093-024-00365-x>

- Sagita, L., Putri, R. I. I., Zulkardi, & Prahmana, R. C. I. (2022). Promising research studies between mathematics literacy and financial literacy through project-based learning. *Journal on Mathematics Education*, 13(4), 753–772. <https://doi.org/10.22342/jme.v13i4.pp753-772>
- Sagita, L., Utami, N. W., Dwipa, N. M. S., & Wicaksono, B. (2025). Students' financial literacy in math classroom: Insights into financial awareness. *Journal on Mathematics Education*, 16(1), 131–152. <https://doi.org/10.22342/jme.v16i1.pp131-152>
- Said, N., Meng, C. C., Musa, M., & Yaakob, M. N. (2022). Development of Financial Education Training Module for Secondary School Mathematics Teachers: Design and Development Research. *International Journal of Academic Research in Progressive Education and Development*, 11(1), 827–836. <https://doi.org/10.6007/IJARPED/V11-I1/12342>
- Salleh, S., Syed Mohamad, S. I., Haris@harith, Z., & Suraya, M. (2020). The Financial Literacy of Students From The Bachelor in Teaching Preparatory Programme at The Institute of Teacher Education Ilmu Khas Campus. *Jurnal Penyelidikan TEMPAWAN*, 37.
- Santos, E., Tavares, F. O., & Maurício, C. (2025). What Do Children with Above-Average Abilities Understand About Financial Literacy? *Journal of Risk and Financial Management* 2025, Vol. 18, Page 254, 18(5), 254. <https://doi.org/10.3390/JRFM18050254>
- Santoso, A. B., Trinugroho, I., Nugroho, L. I., Saputro, N., & Purnama, M. Y. I. (2016). Determinants of Financial Literacy and Financial Inclusion Disparity Within a Region: Evidence from Indonesia. *Advanced Science Letters*, 22(5–6), 1622–1624. <https://doi.org/10.1166/ASL.2016.6706>
- Sawatzki, C. (2016). *Insights from a financial literacy task designer: The curious case of problem context* (pp. 576–583). Mathematics Education Research Group of Australasia Incorporated. <https://researchprofiles.canberra.edu.au/en/publications/insights-from-a-financial-literacy-task-designer-the-curious-case>
- Sawatzki, C. (2017). Lessons in financial literacy task design: authentic, imaginable, useful. *Mathematics Education Research Journal*, 29(1), 25–43. <https://doi.org/10.1007/S13394-016-0184-0/METRICS>
- Sawatzki, C., & Sullivan, P. (2017). Teachers' perceptions of financial literacy and the implications for professional learning. *Australian Journal of Teacher Education*, 42(5), 51–65. <https://doi.org/10.14221/ajte.2017v42n5.4>
- Scheresberg, C. de B. (2013). Financial Literacy and Financial Behavior among Young Adults: Evidence and Implications. *Numeracy*, 6(2), 5. <https://doi.org/http://dx.doi.org/10.5038/1936-4660.6.2.5>
- Shazreen, N., Saini, A., & Rosli, R. (2021). Financial Elements in Teaching and Learning of Mathematics: A Systematic Review. *International Research in Education*, 9(1), 1. <https://doi.org/10.5296/IRE.V9I1.18033>
- Storozuk, A., & Maloney, E. A. (2023). What's Math Got to Do with It?: Establishing Nuanced Relations between Math Anxiety, Financial Anxiety, and Financial Literacy. *Journal of Risk and Financial Management* 2023, Vol. 16, Page 238, 16(4), 238. <https://doi.org/10.3390/JRFM16040238>
- The Consumer Financial Protection Bureau (CFPB). (2018, June). *Financial Skill Scale Questionnaire*. https://files.consumerfinance.gov/f/documents/bcftp_financial-well-being_financial-skill-scale.pdf

- Thelagaa, C. L., & Rosli, R. (2024). Pengetahuan Pedagogi Isi Kandungan Guru Matematik Dalam Topik Wang Sekolah Rendah. *International Journal of Advanced Research in Education and Society*. <https://doi.org/10.55057/ijares.2024.6.2.26>
- Thi, H., Pham, H., Duc Pham, Q., Bui, C. K., & Le, H. T. (2025). Factors affecting the effectiveness of math teachers' integrated teaching in secondary schools: The case of Vietnam. *Journal of Pedagogical Research*, 9(1). <https://doi.org/10.33902/JPR.202532448>
- Trang, K. T., & Hansen, D. M. (2021). The Roles of Teacher Expectations and School Composition on Teacher–Child Relationship Quality. *Journal of Teacher Education*, 72(2), 152–167. <https://doi.org/10.1177/0022487120902404>;JOURNAL:JOURNAL:JTEA
- Villagomez Amezcua, A., & Hidalgo Everardo, J. A. (2017). Financial Literacy and Mathematics: A Study among Young Mexican High School Students. *Mexican Journal of Economics and Finance*, 12. https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1665-53462017000200001
- Voon, S. H., & Amran, M. S. (2021). *Pengaplikasian Teori Pembelajaran Konstruktivisme Dalam Pembelajaran Matematik Application of Constructivism Learning Theory in Mathematical Learning*.
- Wardat, Y., Belbase, S., Tairab, H., Takriti, R. A., Efstratopoulou, M., & Dodeen, H. (2022). The Influence of School Factors on Students' Mathematics Achievements in Trends in International Mathematics and Science Study (TIMSS) in Abu Dhabi Emirate Schools. *Education Sciences* 2022, Vol. 12, Page 424, 12(7), 424. <https://doi.org/10.3390/EDUCSCI12070424>
- Whitebread, D., & Bingham, S. (2020). Habit Formation and Learning in Young Children.
- Wu, S. J., Wei, D. Y., Zhang, Y. M., Han, J., & Hu, H. Z. (2023). A Survey of an Evaluation Index of Teaching Ability for Financial Literacy Education Based on TPACK for Primary and Secondary School Teachers. *2023 Asia Conference on Cognitive Engineering and Intelligent Interaction (CEII)*, 54–59. <https://doi.org/10.1109/CEII60565.2023.00018>
- Xu, S., Yang, Z., Ali, S. T., Li, Y., & Cui, J. (2022). Does Financial Literacy Affect Household Financial Behavior? The Role of Limited Attention. *Frontiers in Psychology*, 13, 906153. <https://doi.org/10.3389/FPSYG.2022.906153/BIBTEX>
- Zakaria, M. A., & Ahmad, M. F. (2021). Teaching as Performance Studies: Exploring the Pedagogical Content Knowledge (PCK) of Theater Arts. *International Journal of Academic Research in Business and Social Sciences*, 11(2). <https://doi.org/10.6007/ijarbss/v11-i2/9197>
- Zulaihati, S., Susanti, S., & Widyastuti, U. (2020). Teachers' financial literacy: Does it impact on financial behaviour? *Management Science Letters*, 10(3), 653–658. <https://doi.org/10.5267/j.msl.2019.9.014>