The Mediating Role of Digital Financial Literacy : Examining How Problem Based Learning Influences Consumption Decision Making Among Adolescents

Desy Wulan Ayuning Gumilar*, Khresna Bayu Sangka, Salman Alfarisy Totalia
Economic Education Department, Faculty of Teacher Training and Education,
Universitas Sebelas Maret, Indonesia.
***Corresponding Author. Email: desywulangumilar@student.uns.ac.id

Abstract: This study aims to analyze the role of digital financial literacy in mediating problem-based learning in adolescents' consumption decision-making. The research method used a survey with a quantitative approach. The population consists of tenth-grade high school students, sampled using purposive sampling from classes that had undergone problem-based learning in economics subjects covering (1) consumption and (2) financial literacy and prioritizing scales, resulting in 142 respondents. The instrument in this study was a questionnaire on Google Forms, which was distributed via QR code. The data was analyzed using SPSS 25. The results obtained by digital financial literacy can significantly mediate problem-based learning in adolescent consumption decision-making with a Z value of 3.003 > 1.96 and sig 0.002 < 0.05. Integrating digital financial literacy in problem-based learning can synergize to improve students' critical thinking, which gives them the ability to make smart consumption decisions regarding their consumption activities.

Introduction

The rapid development of the times has a broad impact on every aspect of human life, digital financial literacy is an important skill needed to meet the needs of the digital era (Ferilli et al., 2024; Li et al., 2024). Financial literacy is one way to achieve increased financial inclusion and long-term financial security and also explained that digital financial literacy is a combination of financial literacy and digital literacy, with the following dimensions: (1) knowledge of basic skills; (2) awareness of digital financial products and services; (3) digital access and use; (4) decision-making; and (5) protection of personal data, so digital financial literacy is very important to have as a form of increasing skills and knowledge that are useful in decision-making in the digital era (Lyons & Kass-Hanna, 2021). Based on (Morgan et al., 2019) Digital financial literacy consists of (1) knowledge about products and services; (2) awareness of digital financial risks; (3) knowledge of digital financial risk control; and (4) knowledge regarding consumer rights and compensation mechanisms (OJK, 2022). Meanwhile, based on (OJK, 2022) in Indonesia the financial literacy index of 49.68% is still far below financial inclusion which reaches 85.10%, according to (Cameron et al., 2014) This gap must be minimized because digital financial literacy is very important to understand, especially for the younger generation, to help them make financial or consumption decisions that suit their needs. In line with (Golden & Cordie, 2022) Digital financial literacy is possessed by individuals while increasing knowledge and skills that can be used to access digital tools to make better financial decisions.

Decision-making requires critical thinking skills to help individuals provide different rational perspectives and review information in a certain order. Critical thinking based on rational thinking will be more reliable than decision-making based on emotions.(Turan et al., 2019). Rational decision-making is an ideal choice for eliminating ambiguity for individuals to have a better choice structure (Jeanes, 2019). In (Altan et al., 2018) Decision-making theory consists of (1) normative, focusing on the ideal way to make decisions, and (2) descriptive, showing how decisions are made. Based on (Schiffman & Wisenblit, 2019) there are several stages that consumers must go through in making decisions, namely: (1) input, which is influenced by external factors; (2) process, which consists of (a) need for recognition; (b) spectrum of satisfaction; (c) search for information and evaluation; and (d) decision-making; and (3) output, the evaluation stage of the previous process. Certainty and rationality are things that work in classical decision-making theory, but this is not the case with the assumptions in behavioral decision-making theory, which agree that individuals have cognitive limitations. (Zamroni et al., 2020) this means that efforts are needed to improve individual cognitive abilities to be able to support appropriate decision-making.

Nowadays, consumption is not only defined as an activity to fulfill basic human needs but has also developed into a culture that changes society into a modern society where consumption activities are based on rules influenced by market policies (Umanailo et al., 2018). Thus, consumption is not limited to functionality but also how people express the values of their daily, this is in accordance with the interpretation of consumption in the Consumerism Theory of (Baudrillard, 1998; Ritzer, 1997) That public consumption is no longer based solely on use and exchange value, but rather on something abstract as a new value, which is interpreted as a sign of prestige and a luxurious lifestyle that evokes feelings of pride in the consumer, with this paradigm shift in consumption, there emerges consumption behavior that does not align with needs and tends to be consumptive (Rahmatika & Kusmaryani, 2020). The advancement of internet technology plays a role in this paradigm shift, especially in Indonesia, which is noted (Kominfo, 2019) as ranking first in e-commerce growth, with users reaching 178.94 million in 2022 and expected to potentially increase to 208.85 million by 2024 (Statista Research Department, 2023) and ranking fifth among countries with the highest frequency of online shopping. Based on (Rahmatika & Kusmaryani, 2020) consumptive behavior is caused by (1) Impulsive buying, purchases made on momentary impulses without long-term consideration; (2) Wasteful spending, engaging in purchases without definite needs; and (3) Irrational purchases, driven by social status. It is not only adults who are trapped in inappropriate consumption behaviors, but also adolescents (Anwar et al., 2019). Adolescents who carry out this behavior according to (Wening, 2014) are adolescents with weak character and easily influenced, and do not have critical thinking skills or proper good attitudes, thus causing intrapersonal and interpersonal interference such as getting angry easily and doing other inappropriate things just to get the desired item. This is enough to explain several social phenomena among adolescents, such as many adolescents getting caught in online loans (*pinjol)* just for a luxurious lifestyle, only to be unable to pay them off (Fajarnusa, 2023), consumptive behavior by using school aid funds to buy luxury goods for prestige (Wibowo, 2023).

The importance of critical thinking skills is an absolute must for every adolescent to have because it can improve their ability to make rational and effective decisions (Yang et al., 2022). Improved critical thinking according to (Tintaya et al., 2022) this can be achieved through learning methods implemented in schools, enabling students or adolescents to acquire sufficient knowledge to guide them in making and evaluating their decisions, so they can make decisions that are not detrimental. Based on Gybers in (Rowland, 2004; Zamroni et

al., 2020) think that generally, adolescents cannot make wise decisions based solely on experience, they require support and exploration through curriculum or learning that guides them towards making appropriate decisions, and the school and its environment have a more dominant influence than the family in providing sources of financial information (Sohn et al., 2012), as stated (Murtafiah, 2021) by utilizing appropriate learning methods or guidance programs, it is possible to enhance the ability to make informed decisions, especially those related to consumption activities. One of them is problem-based learning, hereinafter referred to as PBL which in the 21st century is part of innovative student-centered learning, using problem-solving tactics as its foundation. The use of real-world problems in this method aims to enhance students' skills and understanding (Akbar et al., 2023; Cachinho, 2009; Wood, 2003). PBL is also described as an approach that focuses on practical problem solving that places students at the center of the learning process by making students collaborate in groups. (Huang & Liao, 2024).

PBL is a learning method used to encourage students to have the ability to think more openly, critically, and reflectively regarding the various problems presented (Anggraeni et al., 2023) so that students' thinking skills in decision-making become honed and will be very useful in real life. In (Akbar et al., 2023) as part of innovative learning PBL has the following characteristics: (1) the problem presented must be authentic; (2) student-centered; (3) learning is active; (4) inquiry-based, where students are encouraged to explore various points of view; (5) knowledge integration; (6) the presence of facilitators; and (7) reflection and metacognition, as a process of evaluating and implementing new knowledge. In this way, PBL becomes a relevant method in the digital era because it allows students to hone their skills in dealing with problems in accordance with current conditions. In line with this, the use of problem based learning methods according to (Murtono et al., 2020; Putri et al., 2023; Yulianti & Gunawan, 2019; Zamroni et al., 2020) able to increase critical reasoning abilities in solving problems, increase knowledge and decision-making abilities, but it is different from what was conveyed by (Vecolitha & Yudiarso, 2021) that problem-based learning produces a not-too-big influence on improving critical reasoning abilities, this opens up opportunities for other factors that can enhance the impact of problem-based learning on students' critical thinking abilities in decision-making, such as digital financial literacy. Known in research (Darmansyah et al., 2023; Motiara & Suciptaningsih, 2024) the connection between problem-based learning and increasing financial literacy is effective, and the use of this method can significantly increase understanding of financial literacy concepts. Meanwhile in (Isfahani et al., 2024) statistically the use of problem-based learning does not result in significant differences compared to conventional methods. On the other hand, based on (Lusardi, 2011; Respati et al., 2023; Setiawan et al., 2022) digital financial literacy has an impact on decision-making and serves as a regulator of individual financial behavior amidst rapid technological advancements. But (Hidayanti et al., 2023; Khasanah et al., 2022) financial literacy does not have an impact on consumptive behavior, which means that whether digital financial literacy exists or not, it will not affect individual consumption decision-making. In its function as a mediator, digital financial literacy is able to mediate the use of technology for financial inclusion (Amnas et al., 2024), in other words, digital financial literacy plays a role in increasing an individual's ability to use technology effectively, which in turn can increase an individual's ability to make decisions that are more appropriate and suits their needs.

In initial observations carried out on the high school adolescent population in Ngawi Region, 53% still engaged in consumption behavior that was not in accordance with the needs of their average pocket money, 70% of them are influenced by external factors. Based

on the above explanation, the study aims to explore the mediating role of digital financial literacy in adolescent consumption decision-making using students' perceptions of problem-based learning methods, digital financial literacy, and decision-making. Digital financial literacy is possessed by individuals while increasing knowledge and skills that can be used to access digital tools to make better financial decisions (Golden & Cordie, 2022) and also the integration of digital financial literacy in the context of problem based learning adds problem construct, therefore students can generate many hypotheses about the causes of problems and possible solution (Patria, 2015). Financial literacy, both conventional and digital, has an important role for young people, which can help them face various decision-making possibilities related to consumption and finances that have important consequences throughout their lives (Lusardi, 2015), thus forming a younger generation that is more confident and capable of facing various challenges in the future with greater information and self-assurance.

Research Method

This research used a survey method with a quantitative approach. Data was collected via a Google Form in March 2024 at SMAN 2 Ngawi East Java Province, which was distributed via QR code scanning. The research sample was taken using a purposive sampling method, which was carried out in classes that had received problem-based learning in economics subjects with (1) consumption materials and (2) financial literacy and a priority scale, so that 142 respondents were obtained. The questionnaire used has provided answers that have a weighted score on a 4-answer Likert Scale by eliminating neutral or undecided options (1 = strongly disagree, 4 = strongly agree). There are three variables in this research, namely (1) problem-based learning (PBL), with 14 items related to student perceptions of student-centered learning, small groups, problems as stimuli, real-world problems, and self-directed learning (Patria, 2015). (2) digital financial literacy with 14 items related to students' perceptions of financial knowledge, digital knowledge, awareness of digital financial services, and practical know-how to use digital financial services (Lyons & Kass-Hanna, 2021; Morgan et al., 2019; Respati et al., 2023). (3) consumption decision-making with 10 items related to student perceptions in identifying problems, generating alternative solutions, determining choices, and evaluating the effectiveness of choices (Altan et al., 2018; O'Hare et al., 2016; Sutinah et al., 2023).
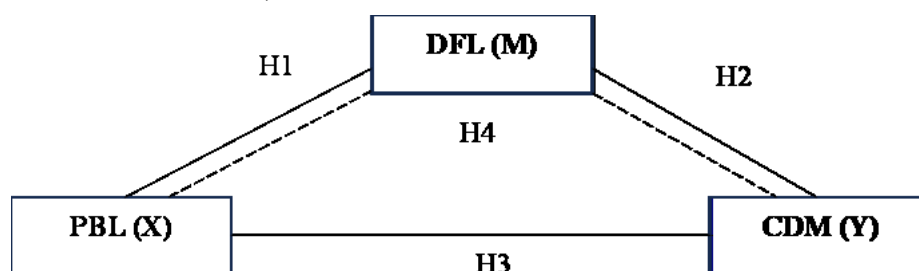

Figure 1. Conceptual Framework

The questionnaire results were analyzed using IBM SPSS version 25 software. The instrument is said to be valid if the calculated r > r table (Sugiyono, 2017). In this study, the calculated r is greater than > 0.349 with a significance value of less than 0.05. Then, for the reliability value, use Cronbach's alpha, where the value range is obtained from 0.735 to 0.872, which is higher than 0.6, so that the reliability of the instrument is accepted. Then proceed with the data analysis process, which will be carried out sequentially: (1) normality

test; (2) linearity test; (3) multicollinearity test; (4) heteroscedasticity; (5) path analysis; and (6) Sobel Test.

Results and Discussion

Based on data obtained from respondents, the majority were female with a total of 101 and 41 male. On average, they have an e-wallet in the form of ShopeePay, with a total of 87; Dana (e-wallet) is 18, GoPay is 17, OVO is 4 respondents, and the rest say they don't have one**.** As for e-commerce, which is often used to make purchases, 125 respondents used Shopee, 5 used Tokopedia, and the rest used TikTokShop and Lazada

Table 1. Descriptive Statistics

Statistics			
	PBL	**DFL**	**CDM**
N Valid	142	142	142
Missing	0	0	0
Mean	44.32	48.16	32.95
Median	44.00	48.00	33.00
Std. Deviation	4.311	4.295	2.789
Minimum	34	36	27
Maximum	56	56	40

Note : PBL=Problem Based Learning; DFL=Digital Financial Literacy; CDM=Consumption Decision Making

Based on table 1, it can be seen that the 142 research samples produced a mean PBL (X) value of 44.32; DFL (M) is 48.16 and CDM (Y) is 32.95. The median of PBL (X) is 44, DFL (M) is 48 and CDM (Y) is 33. Standard Deviation in PBL (X) is 4,311, DFL (M) 4.295 and CDM (Y) 2.789. The minimum value of PBL (X) is 34, DFL (M) is 36 and CDM (Y) is 27. The maximum value of PBL (X) and DFL(Y) is 56 respectively and CDM (Y) is 40.

Tabel 2. Normalitas dan Linearitas

Normality Test		Linearity Test		
N	142	Y*X	0.142	Linear
Sig.	0.061	Y*M	0.926	Linear

Based on table 2 above, the significant value is 0.061>0.05, which means the data is normally distributed. In the linearity test, the deviation from linearity values is all above 0.05, so the data is significantly linear.

Tabel 3. Heteroscedasticity

Variabel	Sig.	Result
PBL	0.980	Heteroscedasticity does not occur
DFL	0.865	Heteroscedasticity does not occur

Based on the results in the table above, the significance value is greater than 0.05, thus indicating that there are no symptoms of heteroscedasticity.

Tabel 4. Multicolinearity

Variabel	Collinearity Statistics		Result
	Tolerance	**VIF**	
PBL	0.852	1.174	Multicollinearity does not occur
DFL	0.852	1.174	Multicollinearity does not occur

Based on the data in the table above, PBL and DFL have a tolerance value greater than 0.01 and a VIF value less than 10, which indicates that the regression model does not have multicollinearity.

Tabel 5. Correlation Between Variables

Variabel	B	SE	Beta	t	Sig	R^2
PBL ⯈ DFL	0.384	0.078	0.385	4.939	0.000	0.148
DFL ⯈ CDM	0.182	0.048	0.281	3.811	0.000	0.357
PBL⯈ CDM	0.278	0.048	0.430	5.832	0.000	0.357

Note **correlation is significant at the 0,05 level (2-tailed).

Based on table 5, the data obtained from the relationship between variables shows a significant relationship, including an influence of 35.7% on the dependent variable for rational consumption decision-making. The acceptable significance value is below 0.05, which means it shows a statistically significant relationship. In more detail, the correlation value of PBL to DFL is 0.385 with a significance of 0.000, and the t-count value > t-table with 4.939 > 1.977. Thus, H_1 is accepted, indicating there is an influence between problem-based learning and digital financial literacy. The correlation value of DFL to CDM is 0.281 with a significance of 0.000 and the t-count value > t-table with 3.811 > 1.977 and H_2 is accepted, which means there is an influence between digital financial literacy on consumption decision-making. The correlation value of PBL with CDM is 0.430 with a significance of 0.000 and t-count > t-table with 5.832 > 1.977, so H_3 is accepted, which means there is a significant influence of problem-based learning on consumption decision-making. Then, to find out H_4, path analysis and the Sobel test are needed.

Tabel 6. Direct And Indirect Relationships of Variables

X	M	Y	X⯈M	X ⯈ Y	X ⯈ M ⯈ Y	Total effect	R^2	Other Variabel
PBL	DFL	CDM	0.385	0.430	(0.385x0.281)=0.108	0.538	0.357	0.643

Tabel 7. Sobel Test

a	Med	b	a	b	Sa	Sb	Z	Sig.	Result
X	M	Y	0.384	0.182	0.078	0.048	3.003	0.002	Mediate

In table 6, the direct effect is 0.430 and the indirect effect is 0.108, and in the Sobel test, which is used to determine the significance of digital financial literacy as a mediator, it can be seen in table 7 that the Z value is 3.003 > 1.96 and the significance value is below 0.05, namely 0.002. This shows that digital financial literacy can significantly mediate problem-based learning in consumption decision-making, which also answers H^4.

Discussion
Problem Based Learning on Digital Financial Literacy

The significant and influential results obtained from the problem-based learning hypothesis test on digital financial literacy in high school adolescents show that students' perceptions when problem-based learning is carried out in economics subjects can effectively increase their knowledge and understanding of digital financial literacy, this is in accordance with previous research by (Darmansyah et al., 2023; Motiara & Suciptaningsih, 2024). This increase makes it possible for students to feel they have gained new knowledge through the use of realistic problems related to financial management because the real-world problem item received a fairly high percentage of 79%. PBL allows students to directly, either individually or in groups, gain learning experience regarding the application of financial concepts in the digital era and how to overcome these problems (Motiara & Suciptaningsih, 2024). It is hoped that the effectiveness of problem-based learning in increasing digital financial literacy will be able to reduce the difference between the level of digital financial literacy and financial inclusion, which is currently still at 35,42 (OJK, 2022), which strong proficiency in digital financial literacy will drive enhanced financial inclusion. In line with

(Gallego-Losada et al., 2023) Financial inclusion entails understanding access to a range of financial products and services, also in (Ferilli et al., 2024) Digital financial literacy is needed as an important skill for using digital financial products and services. From the explanation above, adolescents with good comprehension of financial literacy, both digital and conventional, will be more able and wiser to prepare themselves to face various financial management challenges in the future.

Digital Financial Literacy on Consumption Decision Making

In the current digital era, consumer behavior has shifted meaning. It goes beyond mere fulfillment of basic needs, transforming into symbols of prestige and a luxurious lifestyle (Baudrillard, 1998; Ritzer, 1997). The significant results obtained from digital financial literacy have on consumption decision-making, shows that the role of digital financial literacy is very positive in consumption decision-making, This is in line with the research conducted by (Lusardi, 2011; Respati et al., 2023; Setiawan et al., 2022) that digital financial literacy has an impact on decision-making and can control financial behavior. Digital financial literacy as a multidimensional concept (Morgan et al., 2019) is knowledge and skills that are capable of influencing financial behavior attitudes in enhancing the quality of decision-making and financial management. The proliferation of e-commerce provides various conveniences for shopping online, thereby increasing consumption behavior that does not meet needs such as consumptive and impulsive purchasing behavior (Gultom B.T et al., 2022; Rahmatika & Kusmaryani, 2020). In this way, adolescents who have a good understanding of digital financial literacy will be able to change their perspective when making consumption decisions that suit their needs, because they will first understand and be cautious about the complexity and risks when deciding to engage in consumption activities through available digital financial services.

Problem Based Learning on Consumption Decision Making

Based on hypothesis testing problem-based learning on consumption decision-making, it produces significant results. Decision-making is a crucial thing in every individual's life. In (Mochis & Moore, 2015) adolescents can have good cognitive abilities and decision-making skills by relying on personal sources to dig up information related to products so that, after knowing the risks and effectiveness of the product, it will help them in making consumption decisions. This skill requires good critical thinking skills (Yang et al., 2022). Problem-based learning, as a student-centered and problem-based approach, facilitates the enhancement of critical thinking skills (Anggraeni et al., 2023; Murtono et al., 2020; Zamroni et al., 2020). Good critical thinking skills will form adolescents who are able to make smart consumption decisions in accordance with needs and minimal risk, thereby avoiding consumptive and impulsive behavior that has a negative impact on themselves and the social environment (Anwar et al., 2019; Eckersley, 2011; Sweeting et al., 2012). Based on the explanation above, it can be concluded that problem-based learning can improve consumption decision-making in adolescents by providing learning experiences based on real situations to be solved and equipping them with critical thinking skills to face complex challenges in making decisions in the future.

Digital Financial Literacy as a Mediator Between Problem Based Learning and Consumption Decision Making

Consumption tendencies that have changed from their basic function (Baudrillard, 1998) encourage consumption behavior that is not in accordance with needs (Rahmatika & Kusmaryani, 2020). The ease of transactions in online and offline consumption activities through digital financial services is gradually increasing this shifting consumption behavior in modern society (Rohayedi & Maulina, 2020) for that reason (Koskelainen et al., 2023)

Digital financial literacy can be used to recognize potential risks that may occur in the process. Adolescents are also impacted by consuming patterns that are not in line with needs (Anwar et al., 2019) which according to (Wening, 2014) those adolescents have weak characters and minimal critical thinking skills, so they are easily influenced by their consumption decisions. Problem-based learning emerges as one of the innovative teaching methods capable of enhancing critical thinking skills (Anggraeni et al., 2023) which emphasizes the use of problems according to current conditions that must be solved by students to stimulate critical thinking skills, which are very necessary to be able to make rational and intelligent decisions, especially in consumption activities. The integration of digital financial literacy in the context of problem-based learning adds to the PBL construct so that students can generate many hypotheses about the causes of problems and possible solutions (Patria, 2015). As explained by (Prasad et al., 2018) that financial literacy is generalized as the ability to manage and communicate financial matters. According to (Cameron et al., 2014) if starting at the high school level, it can be the main key to understanding and analyzing effective financial management, so that it will influence both financial and consumption decision-making in this digital era. In this way, digital financial literacy is able to become a mediator in bridging problem-based learning with consumption decision-making, as is the result of the hypothesis testing that has been carried out.

Conceptually, the results of this research show that the use of problem-based learning can strengthen digital financial literacy skills to provide new insights to students in making financial decisions for better consumption behavior in the future. According to Tebogo (2014) individuals develop knowledge and understanding through their interactions and experiences. In line with (Akbar et al., 2023; Cachinho, 2009; Wood, 2003) Problem-based learning is a student-centered approach that uses problem-solving techniques as its foundation, this method involves real problems to enhance students' skills and understanding, so that practically this research can provide an educational foundation for educators and policymakers to develop financial education models that reflect real-world scenarios, enabling them to better prepare students for the financial challenges of the digital era.

Conclusion
Based on the research results obtained by digital financial literacy can significantly mediate problem-based learning in adolescent consumption decision-making with a Z value of 3.003 > 1.96 and sig 0.002 < 0.05.The integration of digital financial literacy in problem-based learning can synergize to improve students' critical thinking, which in turn gives them the ability to make smart consumption decisions regarding their consumption activities.

Recommendation
The recommendations for future research are based on the results of the analysis of combining variables to produce R^2 of 35.7%, so there is still an opportunity for other variables to look for relationships related to consumption decision-making, such as peer influence or family socio-economic conditions, thus enhancing its influence in promoting rational consumption decision-making among adolescents. For teachers to add more varied topics related to money management in the digital era, such as the risks of using financial applications that do not adhere to regulatory standards. For students making decisions on consumption activities in the digital era, it is more important to be vigilant by fully understanding the mechanisms and procedures and exploring broader information before carrying out consumption activities.

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