



The Influence of Financial Literacy, M-Banking Services on Saving Behavior moderated by Gender and Self-Control

Hasna Nur Faramida , Muhammad Sabandi, Dini Octoria

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Economic Education Study Program, Faculty of Teacher Training and Education, Universitas Sebelas Maret, Surakarta, Indonesia

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Abstract

This research aims to determine the influence of financial literacy and mobile banking services on the saving behavior of UNS students and to find out whether gender and self-control can moderate financial literacy and mobile banking services on the saving behavior of UNS students. This study uses a type of quantitative research with a population of UNS students. The determined sample of 144 samples was taken using a non probably sampling technique. The data collection technique uses a five-point Likert scale of 1-5 points distributed via Google Forms. Test the validity of the instrument using Confirmatory Factor Analysis (CFA) and test the reliability using Cronbach Alpha (α). All data is processed using SPSS 25 software. The results of the study prove that: (1) there is a significant and positive effect of financial literacy on saving behavior of UNS students; (2) there is a significant and positive effect of mobile banking services on saving behavior of UNS students; (3) gender can moderate financial literacy and mobile banking services on saving behavior UNS students; and (4) self-control can moderate financial literacy and mobile banking services on saving behavior of UNS students.

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 Correspondance Address:

Jalan Insinyur Sutami No.36 A Kentingan, Jebres, Kec. Jebres, Kota Surakarta, Jawa Tengah 57126

Email: hasnafaramida123@gmail.com

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INTRODUCTION

Economic growth is one of the important indicators in the success of a country's development which can show that the country is financially capable or can be said to be prosperous. Kapounek et al. (2016) revealed that one of the drivers of economic growth is the high level of savings used to finance investment both domestically and abroad, so that it can increase the rate of investment.

According to Kassim (2020) savings is a balance obtained from income and not spent on current consumption needs. Saving behavior is caused by a person's urge to set aside some of the income they earn so that they can meet their needs in the future (Alkhwaja & Albaity, 2022). The importance of saving habits must be instilled because it minimizes never-ending needs in the future, functions to create long-lasting wealth and provides solutions to future financial problems.

Based on global findex data on savings account ownership in 2021 Demirgüç-Kunt et al. (2021) Indonesian people who have savings over 15 years old are only 52%. This number shows that public savings ownership in Indonesia is still relatively low compared to neighboring countries such as Singapore at 98%, Malaysia at 88%, and Thailand at 96%. So, it can be said that the savings culture of Indonesian society is still relatively low.

Students as an academic community whose number is quite large is one of the important components that cannot be separated in improving the economy of a country. Students are expected to participate in improving the economy by increasing the amount of savings they have. However, most students generally experience financial problems such as not having a steady income, limited savings for monthly needs, and delays in remittances from parents. The lecture period is a transitional period where everything that initially depends on parents becomes financially independent, so that students generally face various financial problems such as hampered saving behavior due to excessive consumption

habits (Raszad & Purwanto, 2021). According to Martono & Khafid (2019) at present, the lack of public awareness in saving activities is due to the assumption that saving activities are only carried out when there is excess income after consumption needs are met. In the future, students will occupy the world of work, so they are required to have an independent life and have high responsibility for personal financial management so that they are able to manage finances well (Nababan & Sada-lia, 2012). According to Zakaria et al. (2017) people who fail to manage their finances can face problems such as bankruptcy when they have no money to pay off their debts, so this will lead to feelings of anxiety about financial security and retirement.

Based on the results of the pre-research, it can be concluded that students are still rarely involved in saving activities and prefer to save at home rather than at the bank. Basically, students save with the aim of preparing for life in the future. However, there are still obstacles faced by students such as difficulty setting aside money to reserve for unexpected needs, difficulties in managing finances, difficulties in controlling expenses, prioritizing desires rather than saving and the savings they have are only sufficient for the short term or less than one year.

According to Jamal et al. (2015) saving behavior is influenced by several factors including family involvement, financial literacy, and peers. One of the factors that will be examined in student saving behavior is financial literacy. Financial literacy is a person's ability to process matters related to the economy and make decisions based on knowledge of financial planning, accumulation of wealth, debt and retirement (Lusardi & Mitchell, 2013). Among the younger generation, financial literacy provides benefits in considering saving behavior for retirement through managing excess and lack of money which can encourage someone to make financial decisions for better future planning (Cheema et al., 2018). Someone who has knowledge and proper financial implementation will have a positive impact on

their finances, especially in saving behavior, so that it can provide benefits in meeting future needs (Tarisha et al., 2021).

The technological revolution marked by the use of cell phones, computers and the internet has resulted in the emergence of digital finance such as mobile banking which refers to new technology for accessing banking services via mobile devices (Loaba, 2022). Jack & Suri (2014) revealed that mobile devices have changed from simple communication services to financial tools for society that are cheap and easy to use to carry out transactions so that they can trigger someone's saving behavior. With the existence of financial technology via mobile devices, buying and selling transactions do not need to be done face to face and carry cash directly, but can be done using long distance transactions such as using mobile banking. Based on the opinion of Akturan & Tezcan (2012) mobile banking is an innovative communication channel where consumers interact with banks via mobile devices. Mobile banking offers facilities in the form of paying bills such as electricity, purchases such as credit or data, checking account balances, and transferring or sending money via mobile devices so that it can reduce travel costs and save queue time. Apart from providing convenience, mobile banking can track transactions transparently which can increase trust between economic actors and banks so that this factor can change financial behavior, especially saving behavior (Loaba, 2022). According to Ky et al. (2018) someone who adopts mobile banking is more likely to have a desire to save than someone who doesn't use it. This is because mobile banking services provide many benefits as described.

Research by Ariffin et al. (2017) states that important factors that can influence saving behavior are financial literacy, peer influence and self-control. This is in line with research by Mpaata et al. (2020) with the results of financial literacy and self-control can influence saving behavior. However, in Riyadi & Pritami research (2018) financial literacy gives results that cannot influence saving be-

havior, but mobile banking services influence saving behavior. The results of this study are in line with Ouma et al. (2017) revealed that the factors that influence a person's saving behavior are mobile banking services and financial inclusion. While the research results Setyani (2023) revealed that digital banking services, namely mobile banking, cannot influence a person's savings behavior. According to Obayelu (2012) argue that gender differences influence saving behavior. Meanwhile, according to Termprasertsakul & Kulsiri (2011) revealed that gender has no effect on saving behavior. Based on the results of the several studies above, it was found that there were inconsistencies in the effect of behavior on saving, both the variables of financial literacy, self-control, mobile banking services, and gender on saving behavior. Thus, the focus of this research is to find out whether these variables influence student saving behavior or not.

METHODS

This type of research is a quantitative research using statistical data. The population in this study is active students at Sebelas Maret University class 2019-2022 who have mobile banking and the number is unknown. This study uses a sampling formula according to Hair, JF, Black, WC, Babin, BJ, & Anderson (2010) with the recommended number of 100-200 respondents.

Nonprobability sampling this type of purposive sampling is the technique used in sampling this study. The criteria for respondents in this study were: (1) Active students of Sebelas Maret University class 2019-2022; (2) Have carried out savings activities; and (3) Using mobile banking services.

Tests and questionnaires are techniques for collecting data in this study. The google form questionnaire link was shared online with approximately 350 student respondents through various social media such as Whatsapp and Instagram, with the number of returned questionnaires being 149, and 144 questionnaires that could be processed. To

measure financial literacy variables, using the Guttman scale type, while to measure the variables of mobile banking services, self-control, and saving behavior using a Likert scale type.

Saving behavior according to Ariffin et al. (2017) has three indicators including: (a) saving decision; (b) future needs; (c) austerity measures.

According to Lusardi (2019) financial literacy has three indicators, namely: (a) understanding of calculations; (b) interest rates; (c) understanding of inflation; and (d) understanding of risk diversification.

Mobile banking indicators according to Lewis et al. (2010) there are five indicators, among others: (a) compatibility; (b) perceived benefits; (c) perceived ease of use; (d) credibility; and (e) trust.

Gender indicators are divided into 2 indicators, namely men and women (Ariadi et al., 2015).

Self-control indicators according to Armstrong et al. (2020) consists of six aspects such as: (a) impulsive; (b) simple task preferences; (c) looking for risks; (d) physical activity

orientation; (e) egocentric; and (f) emotions.

Questionnaire statement items were tested for validity using the method Confirmatory Factor Analysis (CFA) and reliability testing using Cronbach Alpha. Data analysis techniques are through descriptive statistical tests, prerequisite analysis tests and hypothesis testing using hierarchical regression analysis, t test, and analysis of the coefficient of determination.

RESULTS AND DISCUSSION

This research analyzes the influence of financial literacy and mobile banking services moderated by gender and self-control on the saving behavior of Sebelas Maret University students, Class of 2019-2022. The independent variables of this research are financial literacy and mobile banking services, the dependent variable is saving behavior, and the moderating variables are gender and self-control which will strengthen or weaken the independent variable. The questionnaire was filled in by 144 respondents from various faculties.

Table 1. Characteristics of Research Respondents

Descriptive Statistics		
Sample Control Variables	Frequency	Percentage
Age		
< 19 years old	33	23%
19-22 years	62	43%
> 22 years	49	34%
Faculty		
Faculty of Law	9	6%
Faculty of Agriculture	17	12%
Faculty of Engineering	14	10%
Faculty of Humanities	10	7%
Medical School	10	7%
Faculty of Economics and Business	9	6%

Sample Control Variables	Frequency	Percentage
Faculty of Teacher Training and Education	30	21%
Faculty of art and Design	11	8%
Faculty of Mathematics and Natural Sciences	16	11%
Faculty of Social and Political Sciences	12	8%
Sports Faculty	6	4%
Pocket Money per Month		
IDR 500,000 – IDR 1,500,000	137	95%
IDR 1,500,000 – IDR 3,000,000	7	5%
> IDR 3,000,000	0	0%

Source: Processed Data, 2023

The number of samples in this study was 144 respondents from Sebelas Maret University students with different characteristics which can be seen in Table 4.1. The ages of respondents in this study were 33 people aged < 19 years, 62 people aged 19-22 years, and 49 people aged > 22 years. The origins of the respondent faculties in this research are different, namely the Faculty of Law as many as 9 people, the Faculty of Agriculture 17 people, the Faculty of Engineering 14 people, the Faculty of Cultural Sciences 10 people, the Faculty of Medicine 10 people, the Faculty of Economics and Business 9 people, the Faculty of Teacher Training and Education 30 people, Faculty of Fine Arts and Design 11 people, Faculty of Mathematics and Natural Sciences 16 people, Faculty of Social and Political Sciences 12 people, and Faculty of Sports 6 people. A total of 137 people have a monthly allowance of IDR 500.

Hypothesis testing in this research uses hierarchical regression analysis, by analyzing the data many times by adding or subtracting variables.

The independent variable can be said to have an influence on the dependent variable if it has a significance level of <0.05, because this research uses a significance level of 5%. Another criterion in the analysis of the t test is $t_{count} > t_{table}$. The way to obtain t_{table} is by using the TINV (probability; degrees of free-

dom) formula in Microsoft Excel. The probability level used is 0.05 and the degrees of freedom are obtained using the formula $df = nk - 1$ ($df = 144 - 4 - 1$) so that the value $df = 139$ is obtained. From the TINV formula, the t_{table} value is 1.9771.

The results of the t test for the financial literacy variable (X1) on saving behavior (Y) can be seen in Model 1 and Model 9. The coefficient values and t-calculated values respectively before adding the control variables are 2.790 and 7.723, after adding the control variables they are 2.742 and 7.437. The Sig value <0.05 before and after adding the control variable is 0.000. Based on the results of the $t_{count} > t_{table}$ ($7.723 > 1.9771$) and ($7.437 > 1.9771$) and the Sig. value <0.05 ($0.000 < 0.05$) so that the financial literacy variable (X1) has a significant effect on saving behavior (Y) with the direction of influence being positive because it has a positive coefficient value.

The results of the variable t test on mobile banking services on saving behavior (Y) can be seen in Model 2 and Model 10. The coefficient values and t-calculated values respectively before adding the control variables are 0.471 and 5.849, after adding the control variables they are 0.468 and 5.910. The Sig value <0.05 before and after adding the control variable is 0.000. Based on the results of the $t_{count} > t_{table}$ ($5.849 > 1.9771$) and ($5.910 > 1.9771$) and

Table 2. Hierarchical Regression Analysis Test Results before adding Control Variables

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Key Variables								
Financial Literacy (X1)	2.790*** 7.723	1.520*** 5.381	1.672*** 5.293	2.758*** 3.432	0.141 0.139	0.808 0.764	3.451 1.608	1.747** 2.435
Mobile Banking Services (X2)	-	0.471*** 5.894	0.457*** 5.644	0.443*** 5.465	1.305*** 5.560	1.014*** 3.743	1.016*** 3.765	2.582*** 5.119
Gender(M1)	-	-	0.406** 2.132	1.918** 2.354	14.388** 4.265	12.310** 3.537	12.749*** 3.661	8.568** 2.426
Self-Control (M2)	-	-	-	-	-	0.173** 2.077	0.403** 2.204	1.805*** 4.243
Interaction Variable								
X1*M1	-	-	-	1.142** 2.118	1.151** 2.167	0.695 1.066	0.555 1.844	1.147** 2.129
X2*M1	-	-	-	-	0.611*** 3.887	0.496*** 3.006	0.501** 3.047	0.353** 2.168
X1*M2	-	-	-	-	-	-	0.097** 2.120	0.107** 2.235
X2*M2	-	-	-	-	-	-	-	0.070*** 3.616
Constant	21.927	12.064	11.522	13.204	16.043	14.368	15.551	17.808
N	144	144	144	144	144	144	144	144
R	0.135a	0.404a	0.413a	0.422a	0.486a	0.686a	0.704a	0.726a
R2	0.118	0.164	0.172	0.178	0.236	0.471	0.496	0.526
ΔR2	0	0.046	0.008	0.006	0.058	0.235	0.025	0.03

Description: *** p < 0.001; ** p < 0.05

Source: Processed Data, 2023

the Sig. value <0.05 (0.000<0.05) so that the mobile banking service variable (X2) has a significant effect on saving behavior (Y) with the direction of influence that is positive because it has a positive coefficient value.

Gender becomes a moderating variable for the independent variable, namely financial literacy (X1) and the dependent variable, namely saving behavior (Y), through the interaction variable, namely added control variables is 1.142; 2.118 and 1.590; 2,360 with a value of Sig. before and after adding control variables, respectively, namely 0.042 and 0.025. Based on the results of the tcount > ttable

(2.118>1.9771) and (2.360>1.9771), the Sig. value <0.05 (0.042<0.05) and (0.025<0.05) so that the interaction variable between financial literacy with gender having a significant effect on saving behavior (Y) with the direction of the influence being positive because it has a positive coefficient value.

Gender becomes the moderating variable for the independent variable of mobile banking services (X2) and the dependent variable for saving behavior (Y) through the interaction variable, namely X2*M1 which can be seen in Model 5 and Model 13. The coefficient values and tcount values are respectively be-

Table 3. Hierarchical Regression Analysis Test Results after adding Control Variables

Variable	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16
Key Variables								
Financial	2.742***	1.473***	1.647***	2.650***	0.036	0.705	3.025	2.357**
Literacy (X1)	7.437	5.224	5.212	3.305	0.035	0.675	1.423	1.999
Mobile Banking Services (X2)	-	0.468***	0.454***	0.441***	1.317***	1.027**	1.030**	2.633***
Gender(M1)	-	-	1.956**	1.849	14.577***	12.502***	12.916***	8.506**
Self-Control (M2)	-	-	1.998	1.695	4.330	3.602	3.712	2.419
						0.171**	0.373**	1.810***
						2.087	2.062	4.337
Interaction Variable								
X1*M1	-	-	-	1.590**	1.315**	0.760	0.636	1.615**
				2.360	2.000	1.180	0.978	2.776
X2*M1	-	-	-	-	0.621***	0.506**	0.511**	0.355**
					3.973	3.086	3.125	2.201
X1*M2	-	-	-	-	-	-	0.085**	0.126**
							2.054	2.474
X2*M2	-	-	-	-	-	-	-	0.072***
								3.781
Control Variables								
Age	0.821**	0.768**	0.802**	0.795**	0.829**	0.830**	0.808**	0.833**
	2.244	2.338	2.439	2.424	2.659	2.697	2.624	2.839
Faculty	0.117	0.114	0.126	0.131	0.167	0.166	0.164	0.158**
	1.185	1.288	1.418	1.476	1.971	1.982	1.973	1.992
Pocket Money per Month	0.207	0.368	0.335	0.299	0.389	0.303	0.282	0.319
	0.252	0.495	0.451	0.404	0.553	0.435	0.406	0.482
Constant	22.787	13.446	12.808	14.590	17.140	15.511	16.036	18.705
N	144	144	144	144	144	144	144	144
R	0.260a	0.444a	0.448a	0.455a	0.516a	0.701a	0.726a	0.734a
R2	0.168	0.197	0.201	0.207	0.266	0.505	0.526	0.532
ΔR2	0	0.129	0.004	0.006	0.059	0.239	0.021	0.006

Note: *** p < 0.001; ** p < 0.05

Source: Processed Data, 2023

fore and after being added control variable is 0.611; 3.887 and 0.621; 3.973 with a Sig value. before and after adding the control variable, namely 0.000. Based on the results of tcount

> ttable (3.887>1.9771) and (3.973>1.9771), Sig. value <0.05 (0.000<0.05) so that the interaction variable between mobile banking services and gender has a significant effect on

saving behavior (Y) with the direction of influence being positive because it has a positive coefficient value.

Self-control is a moderating variable for the independent variable financial literacy (X1) and the dependent variable saving behavior (Y) through the interaction variable, namely added control variable is 0.097; 2.120 and 0.085; 2.054 with a Sig value. before and after adding control variables, respectively, namely 0.042 and 0.046. Based on the results of the $t_{count} > t_{table}$ ($2.120 > 1.9771$) and ($2.054 > 1.9771$), the Sig. value < 0.05 ($0.042 < 0.05$) and ($0.046 < 0.05$) so that the interaction variable between financial literacy with self-control has a significant effect on saving behavior (Y) with the direction of the influence being positive because it has a positive coefficient value.

Self-control becomes a moderating variable for the independent variable of mobile banking services (X2) and the dependent variable for saving behavior (Y) through the interaction variable, namely $X2 * M2$ which can be seen in Model 8 and Model 16. The coefficient values and t values are calculated respectively before and after adding control variables it is 0.070; 3.616 and 0.072; 3.781 with a Sig value. before and after adding the control variable, namely 0.000. Based on the results of $t_{count} > t_{table}$ ($3.616 > 1.9771$) and ($3.781 > 1.9771$), the value of $Sig < 0.000$ ($0.000 < 0.05$) so that the interaction variable between mobile banking services and self-control has a significant effect on saving behavior (Y) with the direction of influence being positive because it has a positive coefficient value.

Based on the results of the hypothesis through the t test, it can be concluded that the research independent variable partially has an influence on the dependent variable. Financial literacy has a positive and significant effect on saving behavior and mobile banking services have a positive and significant effect on saving behavior. Gender moderation variable as an interaction variable with financial literacy and

mobile banking services has a positive and significant effect on saving behavior. The moderating variable of self-control as an interaction variable with financial literacy and mobile banking services has a positive and significant effect on saving behavior.

Attribution theory provides an explanation of how a person determines the causes of his behavior and the consequences that will be received for subsequent behavior (Schmitt, 2015). Attribution theory states that a person's behavior is determined by internal and external factors (Heider, 1958). Internal factors involve explaining behavior based on internal factors that exist within a person, while external factors involve explaining behavior based on external factors that come from outside the individual's control. Internal factors that implement the attribution theory in this study are financial literacy variables that describe a person's knowledge, understanding, and skills in managing their own finances based on their level of literacy, while external factors that implement the attribution theory in this study are mobile banking services where users can assess and interpret their experience with the service.

Effect of Financial Literacy on Saving Behavior

Based on the results of the study, it showed that there was a positive and significant effect of financial literacy on the saving behavior of UNS students. The results of this study are in line with Mpata et al. (2020) which shows that financial literacy significantly influences saving behavior. It can be concluded that the higher the level of financial literacy, the higher the saving behavior of students. The results of this study are not in line with Riyadi & Pritami (2018) that financial literacy has no effect on saving behavior, this is because someone who has a good understanding of financial literacy cannot determine how good someone is at carrying out saving behavior. A person's level of financial literacy has a big impact

on saving behavior, because it can encourage confidence in planning and the willingness to save. Financial literacy can increase a person's understanding of how to manage their personal finances effectively and can reduce the likelihood of making poor financial decisions. Knowledge of financial literacy helps a person make decisions and supports their personal welfare. Without financial literacy, a person will be burdened by a lack of understanding about financial issues. Thus, financial knowledge, skills and abilities are important factors in improving financial behavior. This research gives the result that, Those who have a better understanding of finances are more likely to save effectively. It is proven that financial literacy has a positive and significant impact on saving behavior.

Effect of Mobile Banking Services on Saving Behavior

The results of the study show that mobile banking services have a positive and significant influence on the saving behavior of UNS students. Resultsthis research is in line with Loaba (2022) which reveals that there is a mobile banking serviceinfluence on individual saving behavior. However, Setyani (2023) his research showed that digital banking services, namely mobile banking, had no effect on a person's saving behavior. Apart from providing convenience in financial transactions, mobile banking services also provide benefits such as reduced transaction costs, convenience and reliability which can increase their saving behavior. With financial technology via mobile devices, buying and selling transactions do not need to be done face to face and carry cash directly, but can be done remotely using mobile banking. Mobile banking offers facilities in the form of bill payments, checking account balances, and transferring or sending money via mobile devices so that it can reduce travel costs and save queue time. Mobile banking can also track transactions transparently which can increase trust between customers

and the bank, so that someone who uses mobile banking services can increase their saving behavior.

Gender Moderating the relationship between Financial Literacy and Mobile Banking Services on Saving Behavior

The gender moderating variable produces results that are able to moderate financial literacy and the use of mobile banking services on the saving behavior of UNS students. The results of this research are in line with research conducted by Ramdani (2022) which reveals that gender can moderate the influence of financial literacy on a person's saving behavior. In addition, Loaba (2022) revealed that gender can moderate the influence of using mobile banking services on a person's saving behavior. This is because there are differences between the genders of women and men as well as differences in their knowledge of financial literacy and the tendency to use mobile banking services to increase saving behavior. The results of this study indicate that gender is an important factor in saving behavior because gender as a moderating variable can strengthen student saving behavior.

Self-Control Moderates the Relationship between Financial Literacy and Mobile Banking Services on Saving Behavior

The research results show that the moderating variable self-control can moderate financial literacy and mobile banking services on the saving behavior of UNS students. This is in line with Mpaata et al. (2020) which reveals that someone with a high level of self-control can strengthen the influence of financial literacy on saving behavior. Contrary to research results Alshebami & Aldhyani (2022) that self-control cannot moderate the relationship between financial literacy and saving behavior. Self-control is able to control a person from all temptations to spend money on things that are not important. Individuals who have better self-control have better financial

behavior by saving and making the best use of their money. Self-control can help mobile banking service users manage and maintain their finances with more discipline. With easy access, users can quickly carry out transactions such as withdrawals or fund transfers. Without strong self-control, this can encourage users to make unnecessary expenses. In this case, self-control can help users limit excessive spending.

CONCLUSION

Based on the results of hypothesis testing with statistical analysis, it can be concluded that all independent variables, namely financial literacy and mobile banking services as well as the moderating variables gender and self-control which can strengthen the independent variable over the dependent variable have a positive and significant effect on saving behavior.

The results of this research support the attribution theory proposed by Heider (1958) which states that a person's behavior is determined by internal and external factors, the internal factor in this research is financial literacy and the external factor is mobile banking services. This research can be used for further research as a source of literature and references and can increase insight regarding factors that can influence saving behavior, especially factors originating from internal factors and external factors in attribution theory.

To increase understanding of financial literacy, students can take part in seminars and workshops that focus on financial topics such as financial management and investment. Students can also increase their use of mobile banking services by attending seminars, workshops or promotional events involving representatives from banks or mobile banking service providers so they can understand the benefits they will get from using these services. Apart from that, students can understand the concept of gender or the roles of men and women well, and increase self-control by setting long-term and short-term goals that they want

to achieve so that they remain focused and can provide motivation to control themselves.

This research is expected to provide relevant information for future researchers to carry out further research. Future researchers can also update the variables so that the influence of the independent variable on the dependent variable can achieve greater influence results compared to this research.

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