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Structural Model of Financial and Digital Literacy in Preventing Online Gambling among Students

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Abstract

Financial and digital literacy are essential competencies for college students, enabling them to manage their finances efficiently and avoid engaging in online gambling. Lack of risk awareness and poor self-control can make college students more vulnerable to harmful financial habits. This study explores how financial and digital literacy influence college students' financial behavior, with Financial Stress Reduction (FSR) and Better Self-Control and Budgeting Behavior (BSCB) acting as mediators of Gambling Risk Awareness (AGR) and Gambling Access Resistance (RGA). This study employed a quantitative, cross-sectional approach, surveying 517 students from various academic levels, selected through random sampling. Information was collected through an online survey consisting of 35 questions with a five-point Likert scale and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.1.0.3. The results indicate that financial and digital literacy have a substantial impact on FSR and BSCB, fully mediating the relationship between literacy and AGR/RGA. These findings highlight the need to combine literacy programs with methods to manage financial stress and encourage responsible budgeting. Educational institutions are urged to combine literacy initiatives with training in self-control, financial planning, and digital security awareness.

Keywords: Financial literacy, Digital literacy, Gambling prevention, Financial stress reduction, Self-control, PLS-SEM

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1. Introduction

Online gambling has become a worrying global phenomenon, impacting the economic, social, and mental health of society. Data shows involvement of 46.2% of adults and 17.9% of adolescents in the past year, with adolescent participation increasing from 5.5% to 10.3% after 2020 (Malesu, 2024; Statista, 2025). In Indonesia, approximately 960,000 students are involved, the majority of whom are university students (Kemendikbudristek, 2024; Antaranews, 2024). This high student participation is related to low financial and digital literacy. Indicators show that college students' financial literacy is 47.56%, lower than the national average of 49.68%. Limited digital literacy reduces their ability to recognize financial risks and understand the social, economic, and legal impacts of online gambling (Republika Online, 2024; Li & Fisher, 2022; Ridhoh & Bakhtiar, 2025; Septanto et al., 2024). This phenomenon prompted a literature review on the role of financial and digital literacy in the context of online gambling.

Previous research has shown that financial literacy plays a crucial role in reducing individual involvement in online gambling. Good financial literacy enables individuals to accurately assess risks and manage financial stress through self-control and effective budgeting (O'Connor et al., 2025; Lusardi & Mitchell, 2014; Bai et al., 2023). Meanwhile, digital literacy, which encompasses the ability to assess, understand, and use digital information ethically and safely through the dimensions of information and data literacy and digital safety and ethics, helps individuals be critical of online content, including online gambling advertisements and promotions (OECD/UNESCO, 2023; Amonhaemanon, 2023). Recent findings also confirm that psychological factors, such as financial stress reduction, self-control, and healthy budgeting behaviors, may mediate the relationship between financial literacy and online gambling engagement, while digital literacy strengthens individuals' resilience to exposure to risky digital platforms (Baek et al., 2024; Kim & Xiao, 2023; Park et al., 2024; Lim & Oh, 2025). However, most research still focuses on financial literacy or online

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behavior in general, so the direct relationship between digital literacy and the ability to resist online gambling access has not been thoroughly studied.

Although financial and digital literacy have been shown to be important, research combining the two into a single model for preventing online gambling involvement is limited, particularly among Indonesian university students. Most studies only examine the direct relationship between literacy and involvement, without considering psychological mechanisms as mediators. Furthermore, multidimensional measures of financial literacy (knowledge, attitudes, behaviors) and digital literacy (information and data, safety and ethics, digital problem-solving) are rarely applied together in a single analytical model.

Based on this gap, this study developed and tested a conceptual model explaining the influence of financial literacy and digital literacy on students' ability to resist online gambling access and increase their awareness of online gambling risks. This conceptual model is depicted in Figure 1 below:

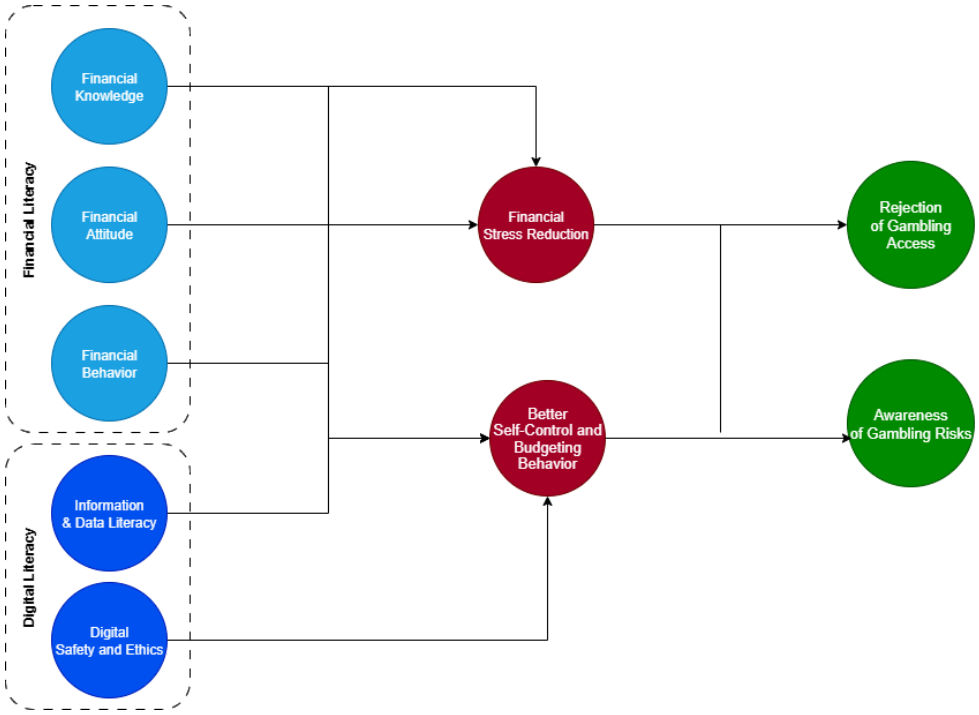

Figure 1. The proposed theoretical model

This model also considers the mediating roles of financial stress reduction, self-control, and budgeting behavior. By integrating financial and digital literacy, along with psychological mechanisms, this study is expected to provide a comprehensive understanding of students' strategies for refraining from online gambling.

2. Literature Review

2.1. Financial Literacy

Financial literacy is an individual's ability to understand and apply financial concepts in decision-making, encompassing financial knowledge, attitudes, and behaviors (OECD/INFE, 2022; Huston, 2010). Knowledge includes an understanding of compound interest, inflation, and basic investments; attitudes reflect a future orientation, savings preferences, and confidence in financial decision-making; behaviors include budgeting, disciplined saving, and avoiding consumer debt (Lusardi & Mitchell, 2014; Graña-Alvarez et al., 2024). Research suggests that high financial literacy can reduce involvement in online gambling by improving risk perception, managing financial stress, and strengthening self-control (O'Connor et al., 2025; Bai et al., 2023). Based on these findings, the following hypotheses are proposed:

H1a: Financial knowledge has a positive effect on refusing to access online gambling.
H1b: Financial attitudes have a positive effect on refusing to access online gambling.

H1c: Financial behavior has a positive effect on refusal of online gambling access.
H1d: Financial knowledge has a positive effect on digital literacy and gambling risk awareness.
H1e: Financial attitudes have a positive effect on digital literacy and gambling risk awareness.
H1f: Financial behavior has a positive effect on digital literacy and gambling risk awareness.

2.2. Digital Literacy

Digital literacy is the ability to access, evaluate, and utilize digital information effectively, safely, and ethically (UNESCO DigComp 2.0; OECD/UNESCO, 2023). Dimensions of digital literacy include information and data literacy, digital security and ethics, digital communication and collaboration, and digital problem-solving. Individuals with strong digital literacy are able to critically assess online content, recognize manipulative gambling advertisements or promotions, and use blocking tools to avoid accessing online gambling (Javaheri et al., 2023; Watanapongvanich et al., 2020). Digital literacy also strengthens the effect of financial literacy in building awareness of gambling risks. Therefore, the proposed hypothesis is:

H2a: Information and data literacy has a positive effect on refusing to access online gambling.
H2b: Digital security and ethics have a positive effect on refusal of online gambling access.
H2c: Information and data literacy has a positive effect on gambling risk awareness.
H2d: Digital security and ethics have a positive effect on gambling risk awareness.

2.3. Financial Stress Reduction

Financial stress arises from an imbalance between financial needs and capabilities, which can trigger risky behaviors such as gambling (Kristianti & Kristiana, 2023). Financial and digital literacy can reduce financial stress through budget management and self-control, thereby reducing the tendency to gamble (Gotama & Rindrayani, 2022; Julaiha et al., 2023). The proposed hypothesis is:

H3a: Financial stress reduction mediates the relationship between financial literacy and online gambling access refusal.
H3b: Financial stress reduction mediates the relationship between digital literacy and online gambling access refusal.

2.4. Better Self-Control and Budgeting Behavior

Strong self-control and effective budgeting behavior are essential for avoiding impulsive behavior, including gambling. Individuals with high self-control tend to stick to budget plans and manage their finances wisely (Huston, 2010). Financial literacy supports these skills practically through realistic budgeting and psychologically by suppressing gambling urges (Kristianti & Kristiana, 2023). The proposed hypothesis:

H4a: Self-control and budgeting mediate the relationship between financial literacy and gambling risk awareness.
H4b: Self-control and budgeting mediate the relationship between digital literacy and gambling risk awareness.

2.5. Awareness of Gambling Risks

Gambling risk awareness encompasses an understanding of the financial, social, and psychological impacts of online gambling (Enzovani et al., 2025; Maro'ah et al., 2024). This level of awareness is closely related to avoiding risky behaviors and developing healthy financial habits. Research shows that education and literacy programs are effective in increasing risk awareness, especially among university students (Karli et al., 2023; Wibowo et al., 2024).

2.6. Rejection of Gambling

Gambling refusal refers to the ability to avoid online gambling sites or apps, for example by using content blockers, and adopting a responsible attitude towards digital technology (Suarantalla et al., 2023). Factors supporting this refusal include risk awareness, digital skills, and financial literacy. Empirical evidence suggests that a combination of financial literacy, digital literacy, financial stress reduction, and self-control enhances students' ability to refuse access to online gambling (Nasruddin & Bado, 2021).

3. Methods

3.1. Research design

This study uses a quantitative approach with a cross-sectional survey design to investigate the relationship between financial literacy, digital literacy, financial stress management, self-control, budgeting behavior, and gambling risk

awareness among college students.(Rohita & Rahmadini Hidayat, 2023)A cross-sectional survey design was chosen due to its efficiency in collecting data at a single point in time, allowing for the exploration of students' perceptions, behaviors, and attitudes regarding financial and digital literacy and their involvement in online gambling.(Maulidina et al., 2023)This approach is very useful for understanding the relationships between variables in the model, which can cover various aspects related to student financial literacy and habits that are influenced by internal (behavior) and external (literacy) factors.

3.2. Samples and data collection

The target population in this study was students in Indonesia, who are a key group in efforts to develop financial and digital literacy and prevent online gambling behavior. This study used a purposive sampling data collection technique to select respondents who met specific criteria relevant to the research objectives.(Patrisia et al., 2023). Sample selection was carried out selectively to ensure that the selected respondents had the capacity to provide valid and representative information related to the topic being researched.(El & Yahiaoui, 2023)i.

Data collection was carried out through online questionnaires distributed through various social media platforms, with the aim of expanding reach and increasing data accessibility from various regions.(Fakhri et al., 2023)This questionnaire included several items designed to measure financial literacy, digital literacy, awareness of gambling risks, and resistance to online gambling access. This approach allowed for efficient data collection and reached a broader target population, while ensuring that the selected sample reflected the diverse characteristics of college students in Indonesia.

3.3. Data analysis and procedures

The obtained data were analyzed using SMART PLS (Partial Least Squares Structural Equation Modeling) to test the research hypotheses. PLS-SEM was chosen because of its ability to handle non-normal data and is suitable for testing complex models with latent variables. Unlike covariance-based SEM, PLS-SEM does not require strict normality assumptions, making it ideal for exploratory research. This method allows for simultaneous analysis of relationships between variables, including direct, indirect, and mediating effects within a single model.(Hair et al., 2019; Ketchen, 2013).

The evaluation process was conducted in two stages: first, evaluation of the measurement model, which included confirmatory factor analysis to assess construct validity and reliability. Validity was tested through factor loadings and average variance extracted (AVE), with an AVE value above 0.5 indicating a valid construct. Construct reliability was assessed using composite reliability (rho_c), where a rho_c value above 0.7 indicates adequate instrument consistency.(Liu et al., 2022; Schwabe & Castellacci, 2020).

The second stage involved evaluating the structural model to examine the relationships between the proposed variables, such as financial literacy, digital literacy, financial stress reduction, self-control, awareness of gambling risks, and refusal to access gambling. Path coefficients were analyzed to determine the strength and direction of the relationships, while the significance of the hypotheses was tested using t-statistics and p-values. The R-squared value was used to measure the model's explanatory power.(Hair et al., 2021; Saricali et al., 2022). With this approach, research can evaluate both components, the measurement model and the structural model, comprehensively.

4. Result and Discussion

4.1. Results

The relationships between financial literacy, digital literacy, financial stress reduction, self-control, budgeting behavior, gambling risk awareness, and gambling access denial were examined using Partial Least Squares-Structural Equation Modeling (PLS-SEM). The analysis was conducted in two main stages: measurement model assessment and structural model evaluation. This study used data from 516 Indonesian university students selected through purposive sampling and representing various academic levels and disciplines. The gender distribution was 73.6% male and 26.4% female. Most participants were aged 20-22 (45.3%), with a significant portion coming from social sciences (39.3%) and undergraduate students (72.1%). Daily internet usage was high, with 65.1% of students reporting more than 3 hours of use daily, and social media was the most common source of financial information (41.5%).

4.1.1. Measurement model evaluation

The measurement model evaluation aims to ensure that each construct in the study is measured accurately and consistently through the indicators used. Researchers conducted tests using three main components: indicator loadings, composite reliability (CR), and average variance extracted (AVE). These three components serve to assess the construct's convergent validity and reliability. Based on the guidelines of Hair et al. (2019), an indicator is declared valid if it has a loading factor value of more than 0.60, a composite reliability above 0.70, and an AVE exceeding 0.50 as the minimum limit for convergent validity. The test results are listed in Table 1.

Table 1. Indicator Loadings, Reliability, and Convergent Validity in Each Construct

Item Code	Item Description (Constructs)	Loading	Rho_C	AVE
	Awareness of Gambling Risk (AGR)			
AGR1	I'm aware of the financial risks of online gambling.	0.682		
AGR2	I understand the negative psychological impacts of gambling	0.734	0.802	0.503
AGR3	I can explain the dangers of online gambling to others.	0.715		
AGR5	I think twice before responding to gambling promotions.	0.705		
	Better Self-Control and Budgeting Behavior (BSCB)		0.815	0.524
BSCB1	I can resist impulsive spending.	0.723		
BSCB2	I strictly follow the budget I created.	0.739		
BSCB4	I regularly review my expenses.	0.698		
BSCB5	I have good control over my daily financial habits.	0.734		
	Digital Safety and Ethics (DSE)		0.784	0.548
DSE2	I am aware of digital fraud risks such as phishing.	0.710		
DSE3	I use digital security features to protect my accounts.	0.742		
DSE5	I use apps to block access to online gambling sites.	0.768		
	Financial Attitude (FA)		0.806	0.511
FA1	I prefer saving money over spending it on unnecessary things.	0.715		
FA2	I feel confident in making financial decisions.	0.733		
FA3	I believe in the importance of long-term financial planning.	0.662		
FA4	I always consider the consequences before purchasing something.	0.746		
	Financial Behavior (FB)		0.803	0.505
FB1	I create a monthly budget and record my expenses.	0.684		
FB2	I regularly set aside a portion of my income for savings.	0.749		
FB3	I avoid using loans for consumptive needs.	0.692		
FB5	I regularly review my personal finances.	0.715		
	Financial Knowledge (FK)		0.835	0.559

Item Code	Item Description (Constructs)	Loading	Rho_C	AVE
FK1	I understand the concept of compound interest in financial planning.	0.732		
FK3	I understand risks in basic investments such as mutual funds or stocks.	0.756		
FK4	I can explain how to manage debt healthily.	0.739		
FK5	I understand the importance of diversification in financial management.	0.764		
	Financial Stress Reduction (FSR)		0.810	0.516
FSR1	I feel more financially at ease after understanding financial literacy concepts.	0.714		
FSR2	I don't feel pressured when facing urgent financial needs.	0.721		
FSR4	I am confident in managing my personal financial situation.	0.725		
FSR5	I feel emotionally more stable when my financial condition is under control.	0.712		
	Information & Data Literacy (IDL)		0.818	0.529
IDL1	I can find relevant and reliable information on the internet.	0.700		
IDL3	I am aware of manipulative advertisements in digital media.	0.688		
IDL4	I find this system essential for completing administrative duties.	0.752		
IDL5	I use multiple sources before making online decisions.	0.766		
	Rejection of Gambling Access (RGA)		0.813	0.521
RGA1	I'm not interested in opening gambling sites/apps.	0.739		
RGA3	I refuse to join digital games with gambling elements.	0.697		
RGA4	I avoid engaging with gambling content on social media.	0.738		
RGA5	I feel comfortable distancing myself from gambling.	0.713		

Note: Awareness of Gambling Risk (AGR), Better Self-Control and Budgeting Behavior (BSCB), Digital Safety and Ethics (DSE), Financial Attitude (FA), Financial Behavior (FB), Financial Knowledge (FK), Financial Stress Reduction (FSR), Information & Data Literacy (IDL), Rejection of Gambling Access (RGA).

The results in Table 1 show that all indicators have loading factor values between 0.682 and 0.768, indicating good reliability. Composite reliability (CR) values range from 0.784 to 0.835, confirming that each construct has high internal consistency. Furthermore, the AVE values for all constructs range from 0.503 to 0.559, exceeding the minimum threshold of 0.50 and demonstrating that each construct meets convergent validity criteria. The Financial Knowledge (FK) construct ($\rho c = 0.835$; AVE = 0.559) and Information & Data Literacy (IDL) construct ($\rho c = 0.818$; AVE = 0.529) demonstrate the highest measurement quality. This indicates that respondents have a good and consistent understanding of the concepts of financial and digital literacy.

Financial behavior and attitude constructs such as Better Self-Control and Budgeting Behavior (BSCB) ($\rho c = 0.815$; AVE = 0.524), Financial Behavior (FB) ($\rho c = 0.803$; AVE = 0.505), and Financial Attitude (FA) ($\rho c = 0.806$; AVE =

0.511) showed good reliability. This finding indicates that respondents have consistent behavior in managing personal finances. The constructs Awareness of Gambling Risk (AGR) (ρc = 0.802; AVE = 0.503) and Rejection of Gambling Access (RGA) (ρc = 0.813; AVE = 0.521) have adequate convergent validity, which means these indicators are able to describe respondents' perceptions of risk and rejection of online gambling activities. Evaluation of the measurement model shows that all constructs have met the criteria for good convergent validity and reliability.

In addition to convergent validity and reliability, this study tested discriminant validity to ensure that each construct has clear distinctions and that there is no overlap between latent variables. Discriminant validity indicates the extent to which a construct differs from other constructs in the research model (Hair et al., 2019). The researchers used the Fornell–Larcker Criterion approach in this test, where the square root of the Average Variance Extracted (AVE) on the diagonal of the table must be greater than the correlation value between constructs in the same row and column. The test results can be seen in Table 2.

Table 2. Presents the Fornell-Larcker criterion results

	AGR	BSBC	DSE	FA	FB	FK	FSR	IDL	RGA
AGR	0.709								
BSCB	0.612	0.724							
DSE	0.605	0.608	0.740						
FA	0.600	0.615	0.586	0.715					
FB	0.678	0.682	0.622	0.653	0.710				
FK	0.582	0.673	0.620	0.637	0.667	0.748			
FSR	0.661	0.653	0.617	0.656	0.687	0.669	0.718		
IDL	0.638	0.648	0.647	0.630	0.653	0.630	0.660	0.727	
RGA	0.658	0.612	0.552	0.608	0.600	0.532	0.618	0.592	0.722

Note: Awareness of Gambling Risk (AGR), Better Self-Control and Budgeting Behavior (BSCB), Digital Safety and Ethics (DSE), Financial Attitude (FA), Financial Behavior (FB), Financial Knowledge (FK), Financial Stress Reduction (FSR), Information & Data Literacy (IDL), Rejection of Gambling Access (RGA).

The results in Table 2 show that each construct has a higher AVE square root value compared to the correlation between the other constructs. This finding indicates that each construct has significant differences and does not overlap conceptually or empirically. For example, the Financial Knowledge (FK) and Financial Attitude (FA) constructs show a higher AVE value than the correlation between them, indicating that the two constructs are measuring different concepts, even though they are both related to financial literacy. The Awareness of Gambling Risk (AGR) and Rejection of Gambling Access (RGA) constructs display higher AVE values than the correlation between them, indicating that the two constructs have different but complementary dimensions in the context of financial behavior.

The Fornell–Larcker Criterion test indicates that the research model meets the criteria for good discriminant validity. This finding confirms that each construct is conceptually unique and there is no redundancy between latent variables. Therefore, the measurement model in this study can be declared valid, stable, and reliable, making it suitable for use in the structural model analysis stage.

4.1.2. Structural model evaluation

One important step in ensuring the quality of a structural model is to evaluate multicollinearity for each predictor construct in the model. This evaluation aims to ensure that each construct can contribute independently without any double influence or high overlap between predictor variables. Variance Inflation Factor (VIF) analysis is necessary to ensure model reliability, as a low VIF value indicates no significant multicollinearity among the variables. A low VIF value indicates that each variable contributes clearly and independently to the model. The results of the VIF evaluation are presented in detail in Table 3, which illustrates the VIF values for each analyzed variable.

Based on Table 3, all VIF values for each construct in the model are below the critical limit of 5. For example, the VIF values between Better Self-Control and Budgeting Behavior (BSCB) and other constructs range from 1.74 to 2.30; the highest values are found in Information & Data Literacy (IDL) and Financial Knowledge (FK) at 2.31 and 2.30, respectively. All these values indicate the absence of harmful multicollinearity between constructs in the model, so that the estimated relationships between variables remain valid and can be interpreted independently. Overall, the VIF

assessment results confirm that the structural model design has met the requirements for the absence of multicollinearity, so that each construct contributes independently to the model.

Table 3. Inner model VIF assessment

	AGR	BSBC	DSE	FA	FB	FK	FSR	IDL	RGA
AGR									
BSCB	1.74								1.74
DSE		2.13					2.13		
FA		2.20					2.20		
FB		2.42					2.42		
FK		2.30					2.30		
FSR	1.74								1.74
IDL		2.31					2.31		
RGA									

Note: Awareness of Gambling Risk (AGR), Better Self-Control and Budgeting Behavior (BSCB), Digital Safety and Ethics (DSE), Financial Attitude (FA), Financial Behavior (FB), Financial Knowledge (FK), Financial Stress Reduction (FSR), Information & Data Literacy (IDL), Rejection of Gambling Access (RGA).

After evaluating model quality through multicollinearity analysis, the next step is to visualize the structural relationships between constructs in the research model. This visualization displays a complete path diagram showing all influence paths between latent variables and their path coefficient values. This path model was generated through a bootstrapping procedure with 5,000 resamplings to ensure robust and stable parameter estimates. The structural model visualization is presented in Figure 2.

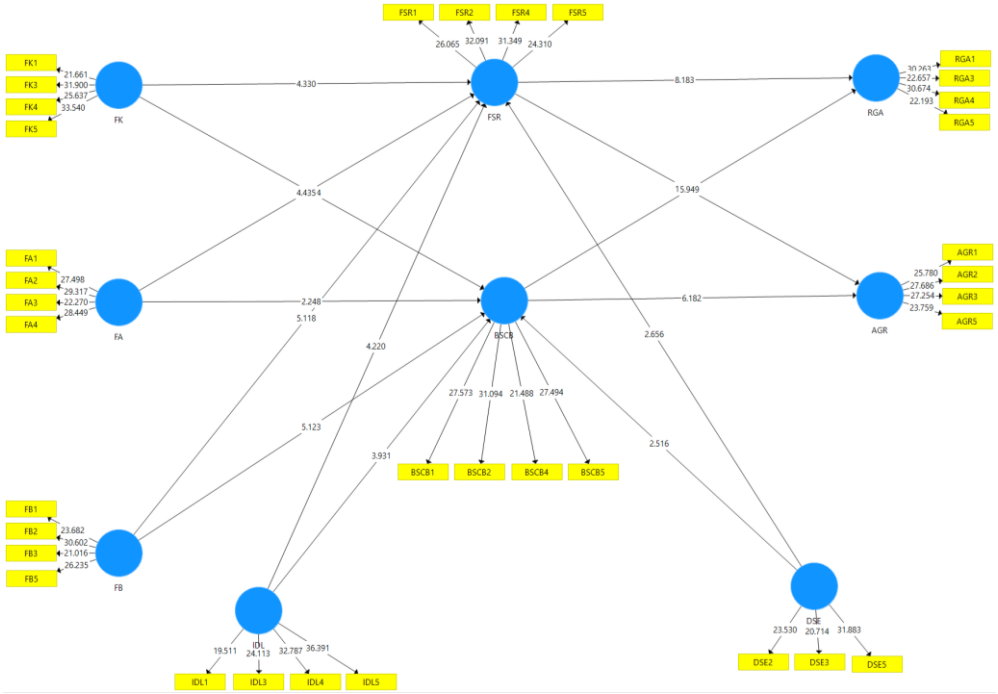

Figure 2. Bootstrapping results

Figure 2 shows the complex relationship structure between constructs in the research model. The figure shows that exogenous variables such as Better Self-Control and Budgeting Behavior (BSCB), Information & Data Literacy (IDL), and Digital Safety and Ethics (DSE) have a direct influence on mediating variables such as Financial Attitude (FA), Financial Behavior (FB), and Financial Knowledge (FK). These mediating variables influence the main endogenous variable, Rejection of Gambling Access (RGA). Each path in the diagram is accompanied by a path coefficient value

indicating the strength and direction of the relationship. To strengthen the validity of the visual findings in the path model, statistical testing was conducted on each hypothesis proposed in the study. Table 3 presents the results of the direct effect test between constructs, which includes pathway coefficient values, t-statistics, and p-values for each relationship tested. This test aims to confirm the statistical significance of each previously visualized influence pathway. The complete results of the direct effect test are presented in Table 3.

Table 3. Direct Effect Result

Hypothesis	Pathway	Pathway Coefficient	T Statistics	P Values	Results
H1a	FK -> RGA	0.17	5.99	0.00	Accepted
H1b	FA -> RGA	0.11	4.24	0.00	Accepted
H1c	FB -> RGA	0.18	5.89	0.00	Accepted
H1d	FK -> DL & AGR	0.17	6.16	0.00	Accepted
H1e	FA -> DL & AGR	0.12	2.36	0.01	Accepted
H1f	FB -> DL & AGR	0.03	1.99	0.02	Accepted
H2a	IDL -> RGA	0.08	3.93	0.00	Accepted
H2b	DSE -> RGA	0.08	3.76	0.00	Accepted
H2c	IDL -> DL & AGR	0.06	3.32	0.00	Accepted
H2d	DSE -> DL & AGR	0.03	2.08	0.02	Accepted

Note: Awareness of Gambling Risk (AGR), Better Self-Control and Budgeting Behavior (BSCB), Digital Safety and Ethics (DSE), Financial Attitude (FA), Financial Behavior (FB), Financial Knowledge (FK), Financial Stress Reduction (FSR), Information & Data Literacy (IDL), Rejection of Gambling Access (RGA).

The analysis results in Table 3 indicate that all direct effect hypotheses tested in this study are accepted. For example, hypothesis H1a, which states that Financial Knowledge has a positive effect on Rejection of Gambling Access, shows a pathway coefficient of 0.17 with a t-statistic of 5.99 and a p-value of 0.00, indicating a highly significant positive relationship. Similarly, hypothesis H1b, which concerns the effect of Financial Attitude on Rejection of Gambling Access, shows a coefficient of 0.11 with a t-statistic of 4.24 and a p-value of 0.00. All t-statistic values are above the critical value of 1.96 and p-values below 0.05, confirming that all direct relationships in the model have strong statistical significance.

In addition to direct effects, this research model also tests indirect effects to understand the mediating role of intermediary constructs in influencing endogenous variables. Table 4 presents the results of the indirect effect test, which demonstrates how the influence of exogenous variables on endogenous variables can be transmitted through the mediator variable. This test is important for identifying more complex mechanisms of influence within the model. The complete results of the indirect effect test are presented in Table 4.

Table 4. Indirect Effect Result

Hypothesis	Pathway	Pathway Coefficient	T Statistics	P Values	Results
H3a	FSR -> FA -> RGA	0.07	3.66	0.00	Accepted
	FSR -> FB -> RGA	0.09	4.13	0.00	Accepted
	FSR -> FK -> RGA	0.08	4.49	0.00	Accepted
H3b	FSR -> IDL -> RGA	0.07	3.37	0.00	Accepted
	FSR -> DSE -> RGA	0.04	2.36	0.01	Accepted
H4a	BSCB -> FA -> AGR	0.03	1.99	0.02	Accepted
	BSCB -> FB -> AGR	0.08	3.93	0.00	Accepted
	BSCB -> FK -> AGR	0.08	3.76	0.00	Accepted
H4b	BSCB -> IDL -> AGR	0.06	3.32	0.00	Accepted
	BSCB -> DSE -> AGR	0.03	2.08	0.02	Accepted

Note: Awareness of Gambling Risk (AGR), Better Self-Control and Budgeting Behavior (BSCB), Digital Safety and Ethics (DSE), Financial Attitude (FA), Financial Behavior (FB), Financial Knowledge (FK), Financial Stress Reduction (FSR), Information & Data Literacy (IDL), Rejection of Gambling Access (RGA).

In Table 4, all tested indirect effect pathways showed statistical significance. For example, hypothesis H3a, which tests the indirect effect of Financial Stress Reduction on Rejection of Gambling Access through Financial Attitude, shows a pathway coefficient of 0.07 with a t-statistic of 3.66 and a p-value of 0.00, indicating a significant mediation effect. Similarly, hypothesis H4a, which examines the effect of Better Self-Control and Budgeting Behavior on Awareness of Gambling Risk through Financial Attitude, shows a coefficient of 0.03 with a t-statistic of 1.99 and a p-value of 0.02. All mediation pathways show t-statistics above the critical value and significant p-values, confirming that the mediator variable plays an important role in transmitting the influence from the exogenous to the endogenous variables.

The test results presented in Tables 3 and 4 indicate that the tested structural model has strong empirical validity. Table 3 indicates that all direct effects between constructs in this model are statistically significant. Meanwhile, Table 4 reveals that the indirect effects through the mediator variables are also significant. These findings provide a comprehensive overview of the influence mechanisms in the model, both through direct and indirect pathways. Overall, these results enrich the theoretical contribution of this study and provide relevant practical implications for policymakers in designing effective interventions to reduce gambling risks through improving financial and digital literacy.

4.2. Discussion

This study aimed to examine the influence of financial literacy and digital literacy on online gambling access refusal among college students, considering the mediating role of psychological variables such as financial stress reduction and self-control. The results showed that all proposed hypotheses were accepted, indicating that financial and digital literacy play a significant role in reducing college students' involvement in online gambling. This finding is consistent with previous research showing that financial literacy can increase risk awareness and prudent financial management, thereby reducing the tendency towards risky behaviors such as online gambling (O'Connor et al., 2025; Lusardi & Mitchell, 2014). Furthermore, digital literacy has also been found to play a role in helping individuals avoid manipulative online gambling content (OECD/UNESCO, 2023; Javaheri et al., 2023).

However, this study offers a novel contribution by combining both financial and digital literacy into a single model. Most previous studies have focused on financial or digital literacy separately (Kim & Xiao, 2023; Park et al., 2024). This study demonstrates that financial and digital literacy complement each other in influencing wiser decision-making in the face of online gambling risks. This is in line with the findings of Baek et al. (2024), who showed that digital literacy strengthens the influence of financial literacy in reducing risky behaviors, including gambling. This study also introduces important mediators, namely financial stress reduction and self-control, which clarify how psychological factors can strengthen the relationship between financial and digital literacy and online gambling rejection.

Practically, the findings of this study provide a strong foundation for educational institutions to design more integrative literacy programs. Such programs could include financial literacy, digital literacy, and skills for stress management and self-control, which would help students avoid risky behaviors, such as online gambling. This aligns with recommendations put forward by Gotama & Rindrayani (2022), who advocated the importance of integrating financial and digital literacy in risk-taking prevention programs. This more holistic literacy program could mitigate the negative impact of online gambling among students, a growing global concern (Malesu, 2024).

Although this study makes significant contributions, there are several limitations worth noting. One is the cross-sectional study design, which only provides a snapshot at a single point in time. Longitudinal research could provide a more in-depth understanding of the long-term impact of financial and digital literacy on online gambling avoidance, as suggested by Kim & Xiao (2023). Furthermore, although this study focused on Indonesian university students, testing samples from other countries could help broaden the generalizability of these findings and examine whether cultural and social factors influence the relationship between literacy and online gambling avoidance (Nasruddin & Bado, 2021).

As a recommendation for further research, it is recommended to conduct longitudinal studies to observe the long-term impact of financial and digital literacy on online gambling avoidance. Further research could also involve a broader sample and include students from various countries to test whether these findings apply internationally. Future research could also explore other psychological factors, such as impulsive tendencies or social influences, that may influence students' decisions regarding online gambling (Wibowo et al., 2024). Furthermore, a multidimensional approach to

measuring financial and digital literacy, as proposed by Baek et al. (2024), could provide a more comprehensive understanding of the factors influencing online gambling avoidance.

Thus, this study paves the way for future studies that can further examine the long-term effects of financial and digital literacy in preventing students' involvement in online gambling, as well as investigate the influence of other social and psychological factors.

5. Conclusion

This study shows that financial literacy and digital literacy significantly influence responsible financial practices and reduce online gambling participation among college students. The analysis revealed that these literacy levels enhance financial stress reduction, self-control, and budgeting behavior, which fully mediate the relationship between literacy levels and gambling access refusal. These findings emphasize that effective interventions should integrate technical skills development with stress management and healthy financial habits through holistic literacy programs. Partnerships with educational technology providers and financial institutions can strengthen these interventions. However, the cross-sectional design limits causal inference, so future research needs to utilize longitudinal designs, broader populations, and technology-based behavioral assessments to provide comprehensive insights into the interplay between literacy, financial management, and online gambling prevention.

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