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Social Media as a Moderator in Green Digital Finance Learning on Green Consumer Behavior

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Abstract: Digital transformation in financial services has increased the need for vocational education to develop digital financial competencies alongside environmentally responsible decision-making. This study examines the effect of Green Digital Finance Learning on Green Consumer Behavior and tests whether Social Media moderates this relationship among vocational students in Surabaya, Indonesia. An explanatory quantitative approach was applied to data from [N] valid respondents, selected according to the study criteria. Data were collected using a five-point Likert-scale questionnaire and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results show that Green Digital Finance Learning has a positive and significant effect on Green Consumer Behavior ($\beta = 0.620$; $t = 16.504$; $p < 0.001$). Social Media also has a positive direct effect on Green Consumer Behavior ($\beta = 0.252$; $t = 6.738$; $p < 0.001$) and significantly strengthens the relationship between Green Digital Finance Learning and Green Consumer Behavior ($\beta = 0.098$; $t = 4.226$; $p < 0.001$). The model explains 61.3% of the variance in Green Consumer Behavior ($R^2 = 0.613$). These findings indicate that sustainability-oriented financial learning is more strongly associated with green consumer behavior when supported by an active digital information environment. The study contributes to vocational education research by linking Green Digital Finance Learning with green consumption and positioning Social Media as a contextual moderator.

Keywords: Green Consumer Behavior; Green Digital Finance; Social Media; Sustainability; Vocational Education

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1. Introduction

Digital transformation is reshaping financial services, consumer decision-making, and educational needs. The expansion of digital financial services has increased the importance of digital financial literacy in helping individuals understand and use financial technologies responsibly. Evidence from Indonesia shows that digital financial literacy is associated with financial behavior among millennials and younger consumers (Kusumawardhani et al., 2025; Normawati & Santoso, 2023; Rahayu et al., 2022). At the same time, sustainability concerns require consumers to consider the environmental consequences of their economic decisions. These developments create a need for educational approaches that connect digital financial competence with environmental responsibility.

Green Digital Finance provides a relevant context for connecting these two developments. It combines digital financial technologies with sustainability-oriented financial practices and can support broader efforts toward sustainable development (Xiao et al., 2024). From an educational perspective, Lee et al. (2025)

demonstrate that education can contribute to the development of green digital finance by strengthening individual capabilities and awareness. Therefore, Green Digital Finance Learning can be positioned not only as a means of developing digital financial knowledge but also as a learning context for understanding the environmental implications of financial and consumption decisions.

Vocational education is particularly relevant because students are prepared to participate in professional and economic activities while developing practical competencies. In this context, learning outcomes may extend beyond technical knowledge to influence everyday decision-making. Muñoz-Céspedes et al. (2021) identified a relationship between financial literacy and sustainable consumer behavior, while recent Indonesian research has further demonstrated the relevance of digital financial literacy to financial behavior among younger consumers (Kusumawardhani et al., 2025). These findings provide a basis for examining whether learning that integrates digital finance and sustainability is associated with students' green consumer behavior.

Green Consumer Behavior involves consumption decisions that consider environmental consequences, including information seeking, purchasing, product use, and evaluation from a sustainability perspective. The digital environment may influence these behaviors by increasing access to environmental information and social interaction (Ng et al., 2025). Xie and Madni (2023) found that Social Media influences green consumption behavior among young consumers, while Iqbal et al. (2024) reported a positive relationship between social media influence and green consumption behavior in Indonesia. More recent research also shows that Social Media can shape green consumption attitudes and intentions through environmental information, social interaction, and digital communication (Fan et al., 2024; Hu et al., 2024).

Although these studies establish the relevance of digital financial literacy, education, Social Media, and green consumption, the relationships have largely been examined through separate research streams. Studies on digital financial literacy have focused mainly on financial behavior (Rahayu et al., 2022; Normawati & Santoso, 2023; Kusumawardhani et al., 2025), whereas research on Social Media has primarily examined green consumption, green purchase intention, or environmental attitudes (Xie & Madni, 2023; Fan et al., 2024; Iqbal et al., 2024). Research directly connecting Green Digital Finance Learning with Green Consumer Behavior while considering Social Media as a contextual factor remains limited. This creates an integration gap concerning whether sustainability-oriented financial learning is translated into green consumption behavior and whether exposure to Social Media changes the strength of this relationship.

Social Media is positioned as a moderator because its function extends beyond information delivery. Students encounter environmental information, social norms, peer experiences, and sustainability-related content through digital platforms. Recent evidence indicates that Social Media can influence green consumption behavior and green purchase-related outcomes (Xie & Madni, 2023; Hu et al., 2024). Accordingly, Social Media may provide a digital environment in which knowledge acquired through formal learning is reinforced through information exposure and social interaction. Testing this moderating mechanism therefore provides a more specific explanation of the relationship between Green Digital Finance Learning and Green Consumer Behavior.

Based on this gap, the present study integrates Green Digital Finance Learning, Social Media, and Green Consumer Behavior into a single empirical model. Green Digital Finance Learning is examined as a predictor of Green Consumer Behavior, while Social Media is assessed both as a direct predictor and as a moderator of the relationship between the two constructs. This approach extends existing research by connecting sustainability-oriented financial learning with consumer behavior and by examining whether the surrounding digital information environment strengthens this relationship.

Accordingly, this study aims to examine (1) the effect of Green Digital Finance Learning on Green Consumer Behavior, (2) the direct effect of Social Media on Green Consumer Behavior, and (3) the moderating effect of Social Media on the relationship between Green Digital Finance Learning and Green Consumer Behavior among vocational students in Surabaya, Indonesia.

2. Literature Review

2.1. Green Digital Finance Learning

Green Digital Finance represents the integration of digital financial technology with green finance principles. In an educational context, Green Digital Finance learning is intended to develop students' understanding of digital financial services and technologies while simultaneously increasing awareness of their economic and environmental consequences. In this study, Green Digital Finance learning is reflected through understanding of green fintech, the use of automated technology in green financial systems, awareness of cyber risks, and environmental awareness.

Kusumawardhani et al. (2025) emphasize the role of digital financial literacy in financial behavior, while Lee et al. (2025) demonstrate that education can support the development of green digital finance. Therefore, better learning that integrates digital competencies and sustainability principles is expected to strengthen students' capacity to make more responsible economic and consumption decisions.

2.2. Green Consumer Behavior

Green Consumer Behavior refers to consumption behavior that considers environmental impacts and sustainability. Muñoz-Céspedes et al. (2021) identify a relationship between financial literacy and sustainable consumer behavior. In this study, Green Consumer Behavior is reflected through Green Information Seeking, Green Purchasing Behavior, Green Usage Behavior, and Green Evaluation Behavior (Wu & Long, 2024). These dimensions represent consumers' efforts to seek environmental information, select environmentally responsible products or services, use resources efficiently, and evaluate consumption decisions from a sustainability perspective.

2.3. Social Media as a Moderating Variable

Social media provides an information environment that can influence consumer perceptions, norms, and decisions. Among students, social media can broaden exposure to sustainability information, green consumption practices, environmental campaigns, and other users' experiences. Oetomo and Santoso (2024) underline the relevance of environmental factors in shaping green consumer behavior in the digital era. In this study, Social Media is positioned both as a direct predictor of Green Consumer Behavior and as a moderator that may strengthen the effect of Green Digital Finance learning on Green Consumer Behavior.

2.4. Research Hypotheses

H1: Green Digital Finance Learning has a positive and significant effect on Green Consumer Behavior.
H2: Social Media strengthens the effect of Green Digital Finance Learning on Green Consumer Behavior.
H3: Social Media has a positive and significant effect on Green Consumer Behavior.

3. Materials and Methods

3.1. Research Design and Participants

This study employed an explanatory quantitative design to examine the hypothesized relationships among Green Digital Finance Learning, Social Media, and Green Consumer Behavior. The population comprised vocational students in Surabaya, with respondents directed toward diploma-level students whose fields of study were related to finance or accounting. Data were collected through a structured questionnaire using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The final number of valid respondents should be reported consistently with the original survey record and is not stated here where the available manuscript does not provide a verifiable figure.

3.2. Research Variables and Measurement

The research model comprised Green Digital Finance Learning (X), Green Consumer Behavior (Y), and Social Media (Z). Green Digital Finance Learning was measured through indicators covering understanding of green fintech, the use of technology in green financial systems, cyber-risk awareness, and environmental awareness. Green Consumer Behavior was assessed through green information seeking, green purchasing behavior, green usage behavior, and green evaluation behavior. Social Media was positioned as both a direct explanatory variable and a moderating variable in the model.

The proposed relationships were specified as follows: Green Digital Finance Learning was expected to influence Green Consumer Behavior (H1); Social Media was expected to strengthen the relationship between Green Digital Finance Learning and Green Consumer Behavior (H2); and Social Media was expected to have a direct effect on Green Consumer Behavior (H3).

3.3. Data Analysis

The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS. PLS-SEM was selected to evaluate the measurement properties of the constructs and the hypothesized structural relationships within the proposed model. The analysis comprised measurement-model and structural-model assessments.

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The measurement model was evaluated primarily through indicator outer loadings and construct reliability and validity. The structural model was assessed using path coefficients, coefficient of determination (R^2), t-statistics, and p-values. Hypothesis testing was conducted through bootstrapping. Statistical significance was determined using a t-statistic greater than 1.96 and a p-value below 0.05. The moderating effect of Social Media was examined through the interaction between Green Digital Finance Learning and Social Media.

The analytical model therefore estimated both the direct relationships and the interaction effect:

$$Y = \beta_0 + \beta_1 X + \beta_2 Z + \beta_3 (X \times Z) + \varepsilon$$

Where X represents Green Digital Finance Learning, Z represents Social Media, Y represents Green Consumer Behavior, and X × Z represents the interaction term used to assess the moderating effect of Social Media.

4. Results and Disscussion

4.1. Data Distribution

Descriptive results indicate that the Social Media construct has a skewness value of -0.179 and excess kurtosis of -0.834, suggesting a relatively symmetric and flatter-than-normal distribution. Green Digital Finance Learning has a skewness value of -0.730 and excess kurtosis of 0.060, indicating a moderately negative skew with kurtosis close to a normal distribution. Green Consumer Behavior has a skewness value of -0.093 and excess kurtosis of -0.817, indicating a nearly symmetric and relatively flat distribution.

The Cramér-von Mises test produced $p < 0.001$ for all three constructs, indicating deviations from the normality assumption. This condition does not constitute a major limitation for the analysis because PLS-SEM is a variance-based approach that does not impose a strict multivariate normality requirement. The significance of the model parameters was therefore evaluated using the bootstrapping procedure.

Table 1. Summary of Construct Distributions

Construct	Observed Min	Observed Max	Skewness	Excess Kurtosis
Social Media (Z)	-2.080	1.564	-0.179	-0.834
Green Digital Finance Learning (X)	-2.955	1.230	-0.730	0.060
Green Consumer Behavior (Y)	-2.322	1.501	-0.093	-0.817

4.2. Measurement Model Evaluation (Outer Model)

Convergent validity was used to assess the ability of the indicators to represent their latent constructs. In general, outer loadings above 0.70 are considered ideal, while values between 0.60 and 0.70 may still be acceptable in exploratory or social science research when overall construct quality is adequate. The Green Digital Finance Learning indicators ranged from 0.673 to 0.752, the Social Media indicators ranged from 0.732 to 0.803, and the Green Consumer Behavior indicators ranged from 0.692 to 0.798. These results indicate that the indicators demonstrate adequate to good convergent validity and can be retained for structural model evaluation.

Table 2. Summary of Outer Loadings

Construct	Number of Indicators in the Model	Outer Loading Range	Interpretation
Green Digital Finance Learning (X)	8	0.673-0.752	Adequate
Social Media (Z)	6	0.732-0.803	Good
Green Consumer Behavior (Y)	8	0.692-0.798	Adequate-Good

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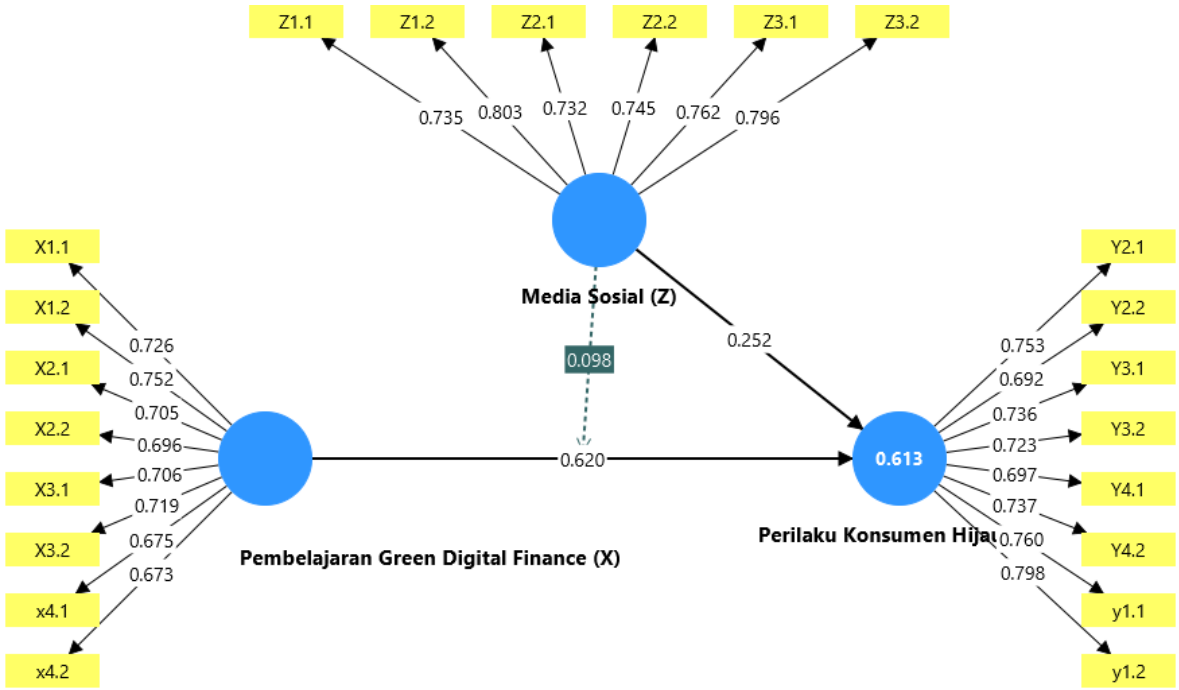


Figure 1. PLS-SEM Model and Path Coefficients

4.3. Structural Model Evaluation (Inner Model)

The R^2 value for Green Consumer Behavior was 0.613, indicating that Green Digital Finance Learning, Social Media, and their interaction jointly explain 61.3% of the variance in Green Consumer Behavior. The remaining 38.7% is explained by factors outside the model. This result demonstrates that the proposed model has substantial explanatory power for understanding green consumer behavior among vocational students.

Table 3. Coefficient of Determination

Endogenous Variable	R^2	Interpretation
Green Consumer Behavior (Y)	0.613	61.3% of variance explained by the model

4.4. Hypothesis Testing

Hypothesis testing was conducted through bootstrapping. All proposed paths produced t-statistics above 1.96 and p-values below 0.05. For scholarly reporting, SmartPLS output shown as $p = 0.000$ is reported as $p < 0.001$.

Table 4. Hypothesis Testing Results

Hypothesis	Relationship	β	t-statistic	p-value	Decision
H1	X → Y	0.620	16.504	< 0.001	Supported
H2	X × Z → Y	0.098	4.226	< 0.001	Supported
H3	Z → Y	0.252	6.738	< 0.001	Supported

Note: X = Green Digital Finance Learning; Z = Social Media; Y = Green Consumer Behavior.

4.5. Effect of Green Digital Finance Learning on Green Consumer Behavior

The results show that Green Digital Finance Learning has a positive and significant effect on Green Consumer Behavior ($\beta = 0.620$; $t = 16.504$; $p < 0.001$); therefore, H1 is supported. The coefficient of 0.620 is the largest direct effect in the model, indicating that the quality of Green Digital Finance learning is a dominant predictor of environmentally responsible consumer behavior among vocational students.

This finding is consistent with Kusumawardhani et al. (2025), who identify digital financial literacy as an important factor in financial behavior, and with Muñoz-Céspedes et al. (2021), who demonstrate a relationship between financial literacy and sustainable consumer behavior. The result also extends the

educational perspective by showing that integrating digital financial knowledge with sustainability principles can contribute to environmentally responsible consumption behavior among vocational students.

4.6. Effect of Social Media on Green Consumer Behavior

Social Media has a positive and significant effect on Green Consumer Behavior ($\beta = 0.252$; $t = 6.738$; $p < 0.001$); therefore, H3 is supported. This finding indicates that social media can function as an informational environment and an informal learning space that supports sustainable consumption behavior. Exposure to sustainability-related information, environmental campaigns, and green lifestyle practices may strengthen students' awareness and willingness to adopt environmentally responsible consumption choices.

This result is consistent with Oetomo and Santoso (2024), who emphasize the relevance of environmental factors in the digital era for shaping green consumer behaviour. In the context of vocational students, social media is not merely a communication channel but also a learning environment that can connect information, social norms, and examples of sustainable behavior with students' everyday consumption decisions.

4.7. Moderating Role of Social Media

The interaction between Green Digital Finance Learning and Social Media has a positive and significant coefficient ($\beta = 0.098$; $t = 4.226$; $p < 0.001$); therefore, H2 is supported. The positive direction of the interaction coefficient indicates that Social Media strengthens the effect of Green Digital Finance Learning on Green Consumer Behavior. In other words, the positive effect of sustainability-oriented digital financial learning becomes stronger when students are also exposed to supportive information and interactions through social media.

This moderating effect highlights the importance of integrating formal learning with the digital information environment. Classroom learning provides conceptual frameworks and evaluative skills, whereas social media offers examples, discussions, and practical contexts that are closer to students' daily experiences. The combination of these two learning environments can help reduce the gap between sustainability knowledge and actual green consumption behavior.

5. Conclusions

This study demonstrates that Green Digital Finance Learning has a positive and significant effect on Green Consumer Behavior among vocational students. Social Media also has a positive direct effect on Green Consumer Behavior and significantly strengthens the relationship between Green Digital Finance Learning and Green Consumer Behavior. The model explains 61.3% of the variance in Green Consumer Behavior, indicating that the integration of digital financial learning, sustainability principles, and the digital information environment is highly relevant to the formation of environmentally responsible consumer behavior.

From a practical perspective, vocational education institutions can integrate Green Digital Finance into the learning process through green fintech materials, responsible digital transactions, cyber-risk awareness, and consideration of environmental impacts. Social media can be used as a supporting learning medium through educational content, case discussions, sustainability campaigns, and examples of responsible consumption practices. Such integration can help vocational education produce graduates who are not only digitally and financially competent but also environmentally responsible.

This study is limited to the context of vocational students in Surabaya and to the constructs included in the proposed model. Future studies may broaden the geographical scope, compare students from different fields of study, and incorporate additional constructs such as environmental knowledge, green attitude, perceived behavioral control, or digital engagement. The source document also does not consistently report the final valid sample size; future manuscript finalization should ensure that the respondent profile and sample-size information are explicitly and consistently reported.

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