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Explaining Students' Digital Entrepreneurial Behavior: The Role of Social Media Adoption in an Integrated TPB–UTAUT Model

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Abstract

Amidst digital transformation and demographic bonuses in Indonesia, the emergence of digital entrepreneurship among the younger generation has become a promising yet challenging phenomenon. The main objective of this study is to develop and empirically evaluate an integrated model that explains students' digital entrepreneurial behavior by integrating psychological and technological viewpoints and combining the Theory of Planned Behavior (TPB) and the Unified Theory of Acceptance and Use of Technology (UTAUT) approaches. TPB has been widely used to predict entrepreneurial intentions and behavior. However, TPB is not yet considered to be able to capture the role of comprehensive technology adoption in the context of digital entrepreneurship. To bridge this gap, this study integrates the UTAUT approach, which focuses on technology acceptance factors. This integration addresses the shortcoming of the TPB by completely including the impact of digital technology adoption on entrepreneurship, while the UTAUT fails to include psychological motivation. PLS-SEM analyzed data from 322 student entrepreneurs who run social media-based enterprises. The study found that the TPB-UTAUT framework explains 62.2% of the variation in social media adoption ($R^2 = 0.622$) and 62.6% of the variance in entrepreneurial activity ($R^2 = 0.626$). Eight out of nine hypotheses were supported: attitudes ($\beta = 0.330$, $p < 0.001$) and perceived behavioral control ($\beta = 0.189$, $p = 0.008$) significantly influenced social media adoption, while attitudes ($\beta = 0.155$, $p = 0.006$), perceived behavioral control ($\beta = 0.295$, $p < 0.001$), performance expectancy ($\beta = 0.149$, $p = 0.011$), and social media adoption ($\beta = 0.225$, $p = 0.001$) directly enhanced entrepreneurial behavior. Effort expectation influenced adoption ($\beta = 0.183$, $p = 0.005$) but not behavior ($\beta = 0.101$, $p = 0.069$). The novelty of this study lies in demonstrating that among digital-native students, effort expectancy loses significance in predicting entrepreneurial behavior, indicating a generational shift in technology adoption dynamics. These insights offer theoretical enrichment and practical implications for designing digital entrepreneurship curricula and policies in developing countries.

Keywords: Social Media Adoption, Digital Entrepreneurial Behavior, Theory of Planned Behavior, UTAUT, Entrepreneurial Students, Digital Technology

1. Introduction

Entrepreneurship fosters national economic growth, generates employment, and promotes innovation [1]. A strong entrepreneurial sector enhances productivity, market competition, and overall economic resilience, providing a crucial element of sustainable development [2]. Despite its importance, Indonesia continues to experience a shortage of entrepreneurs. Only 3.47% of the population engages in entrepreneurship, less than the 4% required for economic sustainability [3]. Furthermore, the elder generations own most businesses [4], with a few youthful entrepreneurs. This reduces innovation and competitiveness in the digital economy. As a result, this study examines how to increase young people's participation in entrepreneurship by leveraging their strong digital engagement.

Technological innovation allows entrepreneurs to create firms at lower costs [5]. Social media platforms such as Instagram, Facebook, and TikTok have altered marketing, customer engagement, and sales [6], [7]. Their accessibility enables entrepreneurs to reach new audiences, establish brands, and develop consumer relationships, lowering obstacles for tech-savvy young people. Thus, the digital ecosystem presents a timely remedy to Indonesia's entrepreneurship deficiency [8].

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Young adults, Indonesia's largest social media users, represent a significant opportunity for digital entrepreneurship [9], [10], [11]. While social media can help to break down barriers and promote growth, psychological and cognitive variables also influence entrepreneurial activity. However, previous research focuses primarily on organizational-level results, leaving a gap in understanding how social media promotes entrepreneurial behavior among students in underdeveloped countries [12], [13], [14].

While digital platforms provide numerous options, psychological and cognitive aspects are essential in determining entrepreneurial intention [15], [16]. This relationship is mediated by social media usage, which provides students with industry knowledge, networks, and marketing tools that allow them to start firms with little capital [17], [18]. Evidence suggests that 76% of Indonesian students follow influencers and 68% buy based on endorsements [19], highlighting the impact of social media in changing both consumer and entrepreneurial decision-making [20], [21].

Digital participation among young individuals is increasingly associated with business aspirations [22], with 69.3% of Indonesia's 275.36 million working-age people [23]. This population, combined with technological advancement, provides numerous chances for entrepreneurship. Students familiar with digital communication frequently utilize social media to promote themselves, network, and expand their businesses [11]. Given that most people prefer online interactions to face-to-face interactions [24], [25]. This trend suggests that integrating social media-based entrepreneurial education into university curricula can enhance entrepreneurial behavior among students.

To date, most previous studies have investigated the influence of social media adoption on business performance at the organizational level, such as MSMEs [12], [13], [26]. However, limited systematic studies have been conducted to investigate how social media usage promotes entrepreneurial activity among students, particularly in developing countries such as Indonesia [14], [27]. This study seeks to address this gap by investigating the factors that drive social media adoption for business and how that adoption influences entrepreneurial behavior.

Although TPB is valid and consistent in describing entrepreneurial intents and behaviors across multiple situations, prior research indicates that it generally accounts for just 40% to 62% of the variability in entrepreneurial behavior [28], [29]. TPB lacks a framework for explaining digital technology adoption, particularly in cases were social media drives entrepreneurship. The dynamics of digital entrepreneurship on platforms such as Instagram, TikTok, and WhatsApp require a paradigm that incorporates behavioral intent, control, and users' perceptions of technology in entrepreneurial activity. To address this limitation, this study integrates TPB with UTAUT, thereby incorporating technology acceptance variables that are absent from TPB but are essential for understanding digital entrepreneurial behavior.

TPB [30] explains behavior using psychological constructs (attitudes, subjective norms, and perceived behavioral control), whereas UTAUT [31] emphasizes technology-related elements such as performance expectancy, effort expectancy, social influence, and facilitating conditions. Integrating the two creates a comprehensive framework for explaining how social media adoption influences entrepreneurial activity. TPB describes students' psychological motives, whereas UTAUT discusses technological reasons [11], [28], [32]. This integration is especially significant given Indonesia's demographic dividend and high digital adoption, emphasizing improving digital entrepreneurial literacy in higher education.

2. Literature Review

Research on technology adoption frequently adopts significant frameworks incorporating psychological and technological components, particularly the TPB and the UTAUT [33], [34]. TPB emphasizes psychological determinants in the form of attitudes, subjective norms, and perceptions of behavior control that affect a person's intentions and actions [30]. This theory has been widely used to explain entrepreneurial intentions and individual-based technology adoption behaviors [11], [35]. However, although the TPB effectively captures the psychological aspect, this theory has not explicitly included the technological determinants important in the digital age [36], [37]. On the other hand, UTAUT focuses on technological factors such as performance expectancy, effort expectancy, social influence, and facilitating conditions [31]. Several recent studies show that the performance expectation and effort expectation of technology use play a significant role in explaining the decision to adopt digital innovation, such as transportation services, online learning, food delivery apps, FinTech, and the use of social media [27], [33].

Several literature studies confirm that a single approach often leaves conceptual gaps, so the integration of TPB and UTAUT is needed to produce a more comprehensive understanding [33], [34]. By combining TPB and UTAUT, the research captured the psychological factors that drive digital entrepreneurial behavior and the technological factors that determine the extent to which students adopt social media as a means of business. Therefore, integrating these two theories is relevant to explaining social media-based digital entrepreneurship behavior among Indonesian students.

2.1. TPB

TPB is a theoretical framework widely used to understand and predict individual behavior, including entrepreneurship [14], [38]. This theory states that the Intention to act is influenced by three main factors: attitudes towards behavior, subjective norms, and perceived behavioral control [30]. Attitude relates to an individual's favorable or unfavorable perception of being an entrepreneur [39], [40]. The subjective norm represents perceived social pressure from significant others (such as family and friends) to engage or not engage in entrepreneurship [38], [41]. PBC refers to an individual's assessment of how easy or difficult it is to start a business, depending on available resources and self-efficacy. High PBC increases confidence in taking business risks and implementing intentions [14], [42]. TPB is relevant in the context of digital entrepreneurship because it can explain how students respond to technology-based business opportunities, such as using social media to start and grow a business [11], [43]. However, despite their conceptual relevance, subjective norms have had limited and uneven consequences. A meta-analysis [44] and following studies [45], [46], [47] discovered that attitudes, self-efficacy, and system usability affect entrepreneurial and technology adoption intentions more strongly than social pressure. As a result, this study removes subjective norms and stresses attitude and perceived behavioral control as more consistent indicators of digital entrepreneurial Intention.

Findings on TPB in digital entrepreneurship are still varied. While attitudes and perceived behavioral control reliably predict intentions, subjective standards are frequently unimportant, especially among independent-minded young [48]. Furthermore, TPB fails to explicitly account for technology-related variables, even though ease of use and perceived benefits significantly impact digital decisions. To better understand digital entrepreneurial behavior, it is crucial to integrate TPB with technology adoption frameworks like UTAUT. UTAUT [31] highlights four significant technology determinants of adoption—performance expectancy, effort expectancy, social influence, and enabling conditions—consistently influencing behavioral intentions across settings such as eHealth and fintech [49]. In entrepreneurship, these categories explain how social media improves business performance, is viewed as simple to use, is influenced by peers or consumers, and is supported by resources and infrastructure [12], [13].

UTAUT explains students' social media usage for entrepreneurship by examining perceived benefits, ease of use, social support, and available resources. However, research reveals contradictory impacts of social influence and favorable environments, especially among independent adolescents with informal technology access, creating a theoretical gap in explaining digital entrepreneurial behavior [13], [50]. In addition, UTAUT is rarely integrated with psychological frameworks like TPB to explain digital entrepreneurship fully. This study addresses the gap by combining both theories to capture how technological and psychological factors shape Indonesian students' adoption of social media for business.

2.2. Attitude toward Digital Business, Social Media Adoption For Business, and Digital Entrepreneurial Behavior

Within TPB, attitude is the primary predictor of Intention and behavior [36], [44]. A positive attitude towards digital business reflects a favorable individual evaluation of entrepreneurial activities based on digital technology [51], [52]. Studies demonstrate that positive entrepreneurial attitudes have significant effects on digital entrepreneurial intentions and technology-driven behavior, especially among students [14], [15], [32], [53]. A positive attitude towards entrepreneurship encourages individuals to be more open to digital opportunities, including utilizing social media as a strategic tool in running and developing businesses [8], [68]. Individuals with strong entrepreneurial attitudes view social media as a valuable platform to realize their business aspirations [56], [57]. Some studies have shown that a positive attitude toward social media strongly predicts the Intention to use it in a business context, particularly among younger generations and micro and small business actors in developing countries [13], [58].

Recent studies also demonstrate that when entrepreneurs perceive social media as valuable and relevant, favorable attitudes strongly drive its adoption, enhancing business outcomes through improved relational and informational capabilities [59], [60]. Perceptions of the usefulness and relevance of social media for business encourage the formation of positive attitudes, which ultimately increase student adoption rates [17], [57]. Moreover, the influence of the social environment, performance expectations, and digital entrepreneurship education may strengthen this relationship, shaping more concrete decisions to adopt social media as part of a business strategy [17], [26]. This relationship becomes even more important in the Indonesian context, where youth engagement with digital platforms is high, but their transformation into productive entrepreneurial behavior remains relatively low [3], [11]. Based on this description, the hypothesis proposed in this study is:

H1: Positive attitudes towards digital business affect the adoption of social media for businesses.

H2: Positive attitudes towards digital business affect digital entrepreneurial behavior.

2.3. Perceived Behavioral Control, Social Media Adoption for Business, and Digital Entrepreneurial Behavior

Perceived Behavioral Control (PBC) refers to an individual's belief in the ability and access to resources needed for behavior, such as starting a digital business [30]. Investigating consumer behavior on social commerce platforms reveals that PBC significantly affects purchase intentions [61]. When consumers feel confident in their ability to navigate and utilize social media platforms, they will likely engage in purchasing behaviors [62], [63].

In a business context, the higher the PBC, the higher the level of social media adoption for businesses [64], [65]. PBC is a key factor that consistently influences SME owners' and employees' intentions and behaviors in various business contexts. [66] Research shows that PBC is the strongest predictor of Intention to implement humane business practices among Malaysian SMEs. In adopting innovations such as cross-border e-commerce in Vietnam and blockchain technology in Malaysia, PBC has also proven to be decisive in the Intention of SMEs to adopt new technologies, in addition to organizational and environmental factors [67], [68]. In financial decision-making, such as using private financing or peer-to-peer lending, PBCs, together with subjective attitudes and norms, significantly affect the intentions of SME owners [69], [70].

In a business context, SMEs' adoption of social media marketing is influenced by a combination of technological, organizational, and environmental factors [26], [71]. Furthermore, PBC has been shown to increase the adoption rate of digital marketing among entrepreneurs, highlighting the role of psychological and cognitive readiness in technology acceptance [72], [73]. Furthermore, [50] research on student respondents shows that the high frequency of social media use strengthens students' PBC levels to become digital entrepreneurs.

Moreover, research in various countries shows that PBC positively affects digital entrepreneurial intentions and behaviors [15], [74]. For example, [16] noted PBC as a significant predictor in digital entrepreneurial intentions and behavior. Similar findings from Jordan also confirm the direct influence of PBC on students' digital business intentions [75]. However, some studies show contradictory findings; PBC does not affect student entrepreneurial intention [76], [77]. This study seeks to bridge this gap by including PBC as a direct predictor of digital entrepreneurial behavior not just Intention—to provide a more realistic picture of the social media adoption process for business among students. Therefore, the hypothesis in this study is:

H3: Perceived Behavior Control affects the adoption of social media for businesses.

H4: Perceived Behavior Control affects digital entrepreneurial behavior.

2.4. Performance Expectancy, Effort Expectancy, Social Media Adoption for Business, and Digital Entrepreneurial Behavior

Performance Expectancy (PE) is the extent to which individuals believe using technology will improve their performance [31]. PE in the context of digital entrepreneurship refers to the extent to which individuals believe that using technology will increase the effectiveness and results of their business [31]. PE reflects the belief that social media can help improve business effectiveness, expand market reach, and facilitate customer communication [12],

[13]. Previous studies support PE's significant role in social media adoption intentions and behaviors for businesses. Several studies have found that PE positively influences SMEs' use of social media in developing countries [26], [71]. Research by [13] also shows that PE is a major predictor of social media adoption by small and medium-sized business actors in Thailand. However, some studies show that the influence of PE can be weakened in populations already familiar with technology, as the perceived benefits become less prominent than comfort or social factors [78], [79].

In the context of young entrepreneurs still in the early stages of business development, the perception of the benefits of social media is believed to remain an essential factor that drives adoption [11]. When students see that social media can accelerate promotion, expand the market, and facilitate interaction with customers, this perception will strengthen the drive to implement real actions in digital entrepreneurship [27], [32]. Furthermore, several studies show that performance expectations, social influences, and positive attitudes towards digital businesses directly increase the use of social media for technology-based entrepreneurial activities, especially among students and young entrepreneurs [11], [13]. When students believe that social media is efficacious in improving their business performance, they are more likely to implement digital entrepreneurial behaviors in real life [32], [80]. Therefore, the following hypothesis is proposed:

H5: Performance Expectancy affects the adoption of social media for businesses.

H6: Performance Expectancy affects digital entrepreneurial behavior.

2.5. Effort Expectancy, Social Media Adoption for Business, and Digital Entrepreneurial Behavior

Effort Expectancy (EE) refers to the extent to which individuals believe that using a particular technology will be easy to use and does not require much effort [31]. It was also found that EE is the primary driver in the adoption of social media by micro-entrepreneurs [12], [81]. Recent research by [12] and [82] reinforces these findings, stating that MSMEs are more likely to integrate social media when they consider the platform uncomplicated and easy to learn. SMEs will hesitate to do social media marketing if the process is considered too complicated and expensive [83].

In the context of entrepreneurial students, EE is related to the perceived ease of using platforms such as Instagram, TikTok, or WhatsApp for digital promotional, communication, and business management activities [12]. The easier a platform is to use, the more likely students will adopt it to support their business activities [11], [80]. However, EE's influence on the adoption of digital technology by MSME actors is not always significant [84]. Thus, while effort expectancy is essential, its influence on digital entrepreneurial behavior is highly dependent on context, other supporting factors, and an individual's perception of the ease and benefits of using digital technology [84], [85]. Therefore, the hypothesis in this study is:

H7: Effort Expectancy Control Affects Social Media Adoption for Businesses.

H8: Effort Expectancy Control affects digital entrepreneurial behavior.

2.6. Social Media Adoption and Digital Entrepreneurial Behavior

Previous studies in various contexts in countries around the world show that the adoption of social media directly affects the business performance of SMEs in countries such as Indonesia [86], Malaysia [87], Thailand [13], Nigeria [88], and Slovenia [89]. Social media has been proven to improve company performance through improved marketing, brand management, and customer relationship capabilities, which ultimately has a positive impact on financial performance and business competitiveness, including in SMEs and e-commerce businesses [71], [90], [91]. The relatively inexpensive use of social media helps SMEs to reach and communicate with customers more widely [92], [86], increase sales and engagement with customers, and expand business networks. Social media is also considered an affordable and easy option for conducting customer analysis related to the conversion of promotions into purchases, content management, and digital automation of promotional content [71], [92]. These findings highlight the crucial role of social media in fostering digital entrepreneurship by enhancing performance, shaping intentions, and facilitating opportunity recognition in the digital business landscape.

Moreover, research indicates that social media adoption has a significant direct influence on digital entrepreneurial behavior. Recent studies have also explored the role of social media on students' entrepreneurial intentions. For instance, a study extended the Theory of Planned Behavior by incorporating social media and perceived risk as

additional variables, revealing that social media usage positively affects students' entrepreneurial intentions [93]. Another research indicates that students utilize social media technologies to promote their businesses and engage with customers, accelerating entrepreneurial growth [94], [95]. Lastly, a study by [11] shows that using social media positively affects technology-based entrepreneurial behavior among students. Therefore, the hypothesis in this study is:

H9: Social media adoption for businesses affects digital entrepreneurial behavior.

An image of the research model can be seen in figure 1.

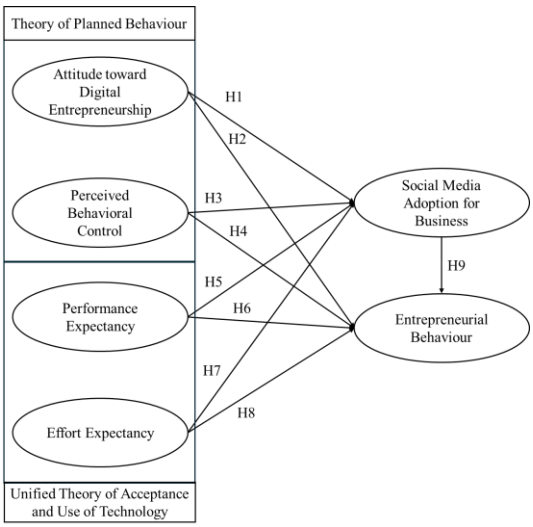

Figure 1. Research Model

3. Methodology

3.1. Research Design, Sampling, and Data Collection Techniques

This study employs a quantitative explanatory design to examine the causal relationships between psychological and technological factors influencing students' digital entrepreneurial behavior. The model integrates TPB and UTAUT to examine how attitudes, perceived behavioral control, and perceptions of social media's usefulness and ease of use drive adoption and business activity [30], [31].

The population of this study is active undergraduate students from various universities in Indonesia who have experience running a social media-based business. Purposive sampling included active 17–23-year-olds who had run a social media business for at least three months and were willing to answer the questionnaire honestly. G*Power calculation with effect size 0.15, $\alpha = 0.05$, power = 0.95, and seven predictors determined a minimum sample size of 153 respondents. The final dataset has 322 valid responses. Online Google Forms were distributed to collect data via social media, student entrepreneurship networks, and school organizations.

3.2. Measures

The instruments in this study are prepared based on the adaptation of theoretical constructs validated in previous research, concerning the combined framework between TPB and the UTAUT. All indicators were compiled as closed statements and measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), reflecting the level of respondents' approval of each statement.

The construct of attitude toward digital business, perceived behavioral control, and digital entrepreneurial behavior is adapted from [30] and [96], which have been widely used in research on entrepreneurial intentions and behaviors. Meanwhile, the constructs of performance expectancy, effort expectancy, social influence, facilitating conditions, and social media adoption are adapted from the UTAUT model developed by [31], [97]. Each indicator in this instrument

has undergone editorial adjustments to suit the context of students actively involved in digital entrepreneurship, especially those who use social media as a business platform.

3.3. Data Analysis

The data was analyzed using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach with SmartPLS software version 4.0. The PLS-SEM method was chosen because it can handle complex research models with many latent constructs and indicators, and does not require normal data distribution [98]. This approach is also suitable for exploratory and predictive studies in the social sciences, including in digital entrepreneurial behavior research [99].

4. Results

4.1. Demographic Profile

Based on table 1, most respondents were male (57.76%), with the largest age group 20–21 years (40.06%), indicating students at the final stage of their studies. This age reflects an early maturity phase and career exploration, which is strategic for developing digital entrepreneurial behavior. The majority came from Management, Business, or accounting programs (66.46%), suggesting that economics and business backgrounds strongly influence social media adoption and entrepreneurship, as these fields emphasize opportunities, marketing, and business management. Geographically, 87.23% of respondents resided in Banten, Jakarta, and Java (West, Central, East) regions with advanced digital infrastructure and better technology access, which supports social media adoption and the formation of digital entrepreneurial behavior.

Table 1. Demographic Profile

Category	Characteristic	Quantity	Percentage
Gender	Man	186	57.76%
	Woman	136	42.24%
Age	17-19 years old	113	35.09%
	20-21 years old	129	40.06%
	22-23 years old	80	24.84%
Education Major	Management/Business/Accounting	214	66.46%
	Information Systems	27	8.39%
	Engineering	26	8.07%
	Visual Communication Design	18	5.59%
	Informatics	7	2.17%
	Others	23	7.14%
Domicile	Banten	189	58.7%
	Jawa Barat	55	17.08%
	DKI Jakarta	29	9.01%
	Lampung	10	3.11%
	Jawa Tengah	8	2.48%
	Jawa Timur	9	2.8%
	Kepulauan Riau	5	1.55%
	Others	17	5.28

4.2. Outer (measurement model analysis)

Evaluation of the measurement model in PLS-SEM ensures that constructs meet reliability and validity standards [100]. Three main criteria were applied: construct reliability, convergent validity, and indicator reliability [101], [102]. First, construct reliability is evaluated with two main parameters: Cronbach's Alpha and Composite Reliability (CR) [102]. The minimum recommended criterion for both is a ≥ value 0.70 [103]. Based on table 2, all constructs in the model

met these thresholds. This shows that the constructs in the model have excellent internal consistency and are reliable in explaining their respective latent variables.

Second, convergent validity is assessed through the Average Variance Extracted (AVE) value, a measure of the proportion of indicator variance successfully explained by the construct. According to [102], A good AVE value is at least 0.50. Based on table 2, all constructs showed an AVE value > 0.50. This result indicates that the indicators used were adequately and theoretically supported the construct.

Third, the reliability of individual indicators is measured through the value of each indicator's outer loading or loading factor against its construct. The ideal criterion for outer loading is ≥ 0.70, indicating that the indicator is highly correlated with the construct [102]. In this Analysis, according to table 2, all indicators have a loading value above 0.70, indicating that each indicator significantly contributes to representing latent constructs.

Table 2. Construct Reliability and Convergent Validity Result

Construct	Indicators		Outer Loadings	Cronbach's Alpha	CR	AVE	VIF
Attitude toward digital entrepreneurship [30], [96]	ATTD_1	Being a digital entrepreneur is the best way for me to express myself	0.820	0.871	0.879	0.660	2.165
	ATTD_2	For my future success, I have to be a digital entrepreneur.	0.789				1.968
	ATTD_4	Being a digital entrepreneur will give me great satisfaction.	0.846				2.331
	ATTD_5	Among the various options, I prefer to be an entrepreneur	0.866				2.443
	ATTD_6	If I have the opportunity and resources, I want to be a digital entrepreneur	0.735				1.622
Perceived Behavioral Control [30], [96]	PBC_1	If I start my own business, the chances of success will be very high	0.726	0.854	0.859	0.635	1.617
	PBC_2	I have enough knowledge and skills to start a business.	0.860				2.470
	PBC_3	I can develop or manage an entrepreneurial project/business	0.854				2.452
	PBC_4	I realized the support needed to start my own business.	0.752				1.762
	PBC_5	I realized the resources needed to start my own digital business.	0.781				
Performance Expectancy [31], [104]	PE_1	Using social media has made it easier for me to improve my entrepreneurial skills	0.876	0.797	0.814	0.709	1.743
	PE_2	Using social media allows me to gain knowledge about the market and consumers	0.817				1.644
	PE_3	Using social media helped me find new business opportunities	0.833				1.703
Effort Expectancy [31], [104]	EE_1	I can use social media for my business	0.826	0.806	0.810	0.720	1.696
	EE_2	People who are important to me think that I should use social media for my business	0.878				1.933
	EE_3	My friends advised me to use social media for my business	0.842				1.684
	SMA_1	I see many opportunities to start and grow a business	0.817	0.803	0.805	0.628	1.793

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Social Media Adoption for Business [31], [104]	SMA_2	Finding potential business opportunities was easy for me	0.757				1.557
	SMA_3	In general, there are many opportunities for new product innovation	0.806				1.758
	SMA_4	I often come across new ideas when I go about my daily activities	0.789				1.661
Digital Entrepreneurship Behavioral [30], [96]	EB_1	I have experience in starting a new project or digital business	0.780	0.881	0.883	0.627	1.932
	EB_2	I can develop a good business plan	0.838				2.289
	EB_3	I know how to start a new business	0.833				2.249
	EB_4	I know how to do market research	0.760				1.788
	EB_5	I have invested capital or other resources in several small businesses	0.752				1.783

After confirming convergent validity and construct reliability, discriminant validity was evaluated to ensure each construct is empirically distinct [102]. Two approaches were applied: the Fornell-Larcker criterion and the Heterotrait-Monotrait ratio (HTMT). Following [105], discriminant validity is attained when the square root of a construct's AVE exceeds its correlations with any other construct. Results in table 3 confirm this requirement for all constructs, indicating stronger variance with their own indicators than with others. The HTMT approach, considered more rigorous, further supports this conclusion with thresholds of <0.85 (conservative) and <0.90 (lenient) [102]; all construct pairings recorded HTMT values below 0.85. This indicates that the constructs in the model are empirically distinct and free from multicollinearity issues. Thus, both Fornell-Larcker and HTMT results confirm the discriminant validity of the measurement model.

Table 3. Discriminant Validity

Construct	Fornell Larcker						HTMT					
	ATTD	EE	EB	PBC	PE	SMA	ATTD	EE	EB	PBC	PE	SMA
ATTD	0.813											
EE	0.599	0.849					0.716					
EB	0.683	0.626	0.792				0.776	0.743				
PBC	0.734	0.611	0.712	0.797			0.851	0.739	0.819			
PE	0.609	0.706	0.641	0.601	0.842		0.729	0.882	0.755	0.723		
SMA	0.712	0.651	0.699	0.675	0.663	0.793	0.848	0.806	0.831	0.815	0.813	

Note: Attitude toward Social Media for Business (ATTD), Entrepreneurial Behaviour (EB), EE, PBC, PE, Social Media Adoption (SMA)

4.3. Inner (structural model analysis)

Assess the model's explanatory and predictive power using R^2 (determining coefficient) and Q^2 (predictive relevance) before examining the significance of the path coefficient. The R^2 score indicates how much the model's exogenous constructs explain the variance of endogenous constructs. A higher R^2 suggests a stronger predictor's explanatory power over the dependent variable [102]. According to [106], R^2 threshold criteria are 0.67, 0.33, and 0.19, indicating substantial, moderate, and weak, respectively. Table 4 shows that SMA has an R^2 value of 0.622, whereas EB has 0.626. The model explains about 62% of the variance in both constructs with moderate to considerable values. This suggests the integrated TPB-UTAUT framework can explain students' social media adoption and entrepreneurial behaviour. Q^2 evaluates the model's predictive significance through a blind folding technique. If the Q^2 value is larger than zero, the model has sufficient predictive power, while a value below zero implies no predictive power [106]. Table 4 shows that SMA and EB Q2 values are larger than 0, showing predictive model capabilities.

Moreover, the relationship between variables is evaluated based on the value of the path coefficient (β), t-value, and p-value. In this context, a hypothesis is declared significant if it has a p-value below 0.05 and a t-value greater than 1.65

at a significance level of 5% [98]. First, the statistical Analysis results in this study focus on the influence of individual psychology in the technology adoption process, which is evaluated using the TPB theoretical framework. Based on table 5, it is known that Attitude (ATTD) has a significant effect on SMA (with β-value = 0.330, t-value = 4.763, and p-value = 0.000), so the H1 hypothesis is accepted. In the context of influence on Entrepreneurial Behavior (EB), ATTD showed significant direct influence (β = 0.155; t = 2.486; p = 0.006), supporting H2. Moreover, the study result indicates that the PBC construct significantly affects SMA (β-value = 0.189; t-value = 2.427; p-value = 0.008), supporting H3. Similarly, PBC strongly affected EB (β-value = 0.295; t-value = 5.078; p-value = 0.000), supporting H4.

After discussing the psychological aspects in the technology adoption process, the next stage is to look at the influence of technological attribute aspects, which are analyzed using UTAUT theory. Based on table 5, PE has a significant impact on SMA (with β-values = 0.219 and 0.183) and EB (β = 0.149; t = 2.279; p = 0.011), respectively. Thus, H5 and H6 were accepted. Moreover, the effect of EE is only significant on SMA (β-value = 0.183; t-value = 2.565; p-value = 0.005). However, the impact of EE on EB (H8) was not statistically significant (β-value = 0.101; t-value = 1.483; p-value = 0.069), so this hypothesis was rejected. Lastly, SMA significantly influenced EB (with a β-value = 0.225, t-value = 3.194, and p-value = 0.001), so H9 was accepted. Eight of the nine hypotheses proposed in this research model were proven significant and accepted.

Table 4. R^2 and Q^2 Result

Latent Variables	R^2	Q^2
SMA	0.622	0.603
EB	0.626	0.591

Table 5. Path Coefficient Result

Hypotheses		Beta	T-Value	P-Value	Decision	f^2
H1	ATTD→SMA	0.330	4.763	0.000	Supported	0.120
H2	ATTD→EB	0.155	2.486	0.006	Supported	0.024
H3	PBC→SMA	0.189	2.427	0.008	Supported	0.039
H4	PBC→EB	0.295	5.078	0.000	Supported	0.093
H5	PE→SMA	0.219	2.632	0.004	Supported	0.056
H6	PE→EB	0.149	2.279	0.011	Supported	0.025
H7	EE→SMA	0.183	2.565	0.005	Supported	0.039
H8	EE→EB	0.101	1.483	0.069	Not Supported	0.012
H9	SMA→EB	0.225	3.194	0.001	Supported	0.052

5. Discussion

Indonesia continues to experience an entrepreneurial deficit, with only 3.47% of the population engaging in entrepreneurship, below the 4% threshold deemed critical for economic resilience [3]. This emphasizes the importance of promoting entrepreneurship, especially among young people, who comprise most of the workforce. Given its profound integration into the daily lives of young Indonesians, digital entrepreneurship through the judicious use of social media is a promising avenue.

In the Indonesian setting, social media adoption is significant. In a business setting, social media utilization provides a low-cost and easily accessible tool for marketing, product development, and consumer engagement [6], [7]. Platforms like Instagram, TikTok, and WhatsApp provide accessible marketing, innovation, and consumer engagement tools, allowing students to explore business concepts with limited resources [6], [7]. Previous research [19], [107] shows that students are active digital consumers; transitioning from consumers to entrepreneurs requires stronger psychological and technological support.

A comprehensive understanding of youth digital entrepreneurship requires integrating psychological and technological perspectives. TPB highlights individual motivations but ignores technology, while UTAUT explains adoption drivers but omits entrepreneurial intent. To address this gap, this study develops and tests an integrated TPB–UTAUT model to describe the digital entrepreneurial behavior of Indonesian university students engaged in social media-based businesses. Studies supported eight of the nine suggested hypotheses, demonstrating the strength of the TPB-UTAUT as an integration framework in describing entrepreneurial behavior in digital contexts. This finding emphasizes that psychological preparedness and technology perceptions are critical in promoting social media adoption and entrepreneurial behavior among young entrepreneurs. The importance of attitude and perceived behavioral control aligns with previous research on the TPB in entrepreneurship [41], [43], affirming that psychological preparedness is a fundamental factor in influencing entrepreneurial intent and behavior. In terms of the TPB framework, the results of this study reinforce the results of previous research conducted by [51], [52], [69], [70] which stated that positive attitudes towards digital businesses were found to influence social media adoption and entrepreneurial behavior significantly. The perceived confidence and self-efficacy in managing resources for starting and running their digital business drive the social media adoption in various contexts [11], [43]. The results of this study show that when young entrepreneurs have a good view of entrepreneurship, they are more likely to adopt social media as a business tool and are more likely to translate that attitude into concrete entrepreneurial behavior. Similarly, perceived behavior control (PBC) also showed a strong direct influence on social media adoption for business as well as entrepreneurial behavior, which is in line with the results of previous research conducted by [13], [14], [54], [65], [97], [98]. These results show that students' confidence in their skills, knowledge, and resources in using social media for business greatly determines whether they turn an opportunity into a real business venture.

Furthermore, using the UTAUT framework, the results of the Analysis of the influence of technology attributes on social media adoption for business and digital entrepreneurial behavior show a significant influence of Performance Expectations (PE). Moreover, aligning with previous research, the substantial impact on performance expectancy corroborates the findings of [13] and [12], highlighting that the perceived benefits of using social media for marketing purposes, like enhancing market reach or optimizing communication with customers, are pivotal in adoption decisions for businesses. The perceived advantages of technology, especially social media, help students manage their business digitally [27], [32]. When students see social media as tools that allow digital businesses to grow, they will become more involved in running the business digitally. Furthermore, the results of this study show that effort EE are significant in driving social media adoption for businesses, confirming that the perception of usability and ease of use remains central in shaping adoption decisions. However, EE does not directly affect digital entrepreneurial behavior. The insignificant correlation between effort expectancy and entrepreneurial behavior offers a novel perspective. Although previous research in different contexts [85], [109] posits that ease of use of social media promotes entrepreneurial engagement, the current findings reveal that for Indonesian students who possess significant familiarity with platforms like Instagram, TikTok, and WhatsApp, the social media ease of use is no longer a critical factor influencing actual entrepreneurial behavior. These results suggest that while ease of use supports early adoption, it does not necessarily encourage sustainable entrepreneurial activity. For digital-native students familiar with social media platforms, ease of use is no longer the primary driver of entrepreneurial behavior.

Third, the adoption of social media itself has been shown to affect digital entrepreneurial behavior significantly. The study result also reinforces previous research findings that ease of use and benefits of technology drive social media adoption for business purposes [26], [71], [88]. Social media usage offers a cost-effective marketing solution to effectively interact, promote, and directly sell products or services to customers. Moreover, the rise of social media offers many digital opportunities, insight into current customers, and business trends that can be used for new business ideation and development [71], [90], [91]. In the context of digital entrepreneurship, students who actively adopt social media are more likely to expand their business networks, engage with customers, and explore innovative business practices. These findings reinforce previous research that recognizes social media as a complementary tool and a strategic driver of entrepreneurial growth, especially for resource-constrained young entrepreneurs.

From a theoretical point of view, this study highlights the added value of integrating TPB and UTAUT into multidimensional explanatory models. TPB considers the psychological dimension, while UTAUT explains the technological perspective. The combined model shows strong explanatory power (R^2 for EB = 0.626) and significantly

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refines UTAUT by showing that the expectation of effort is losing significance among populations already proficient with social media, suggesting a generational shift in the dynamics of technology adoption.

This study validates the efficacy of combining the TPB and the UTAUT as a holistic framework for comprehending digital entrepreneurship. The adoption of social media serves as a mediator connecting human drive to digital involvement. The findings advocate for reforming entrepreneurial education in Indonesia to integrate mentality cultivation and technology proficiency. Programs should instruct on using digital tools and cultivate entrepreneurial confidence, opportunity identification, and strategic reasoning [11]. Similarly, governmental and academic policy initiatives must guarantee that digital infrastructure, mentorship, and finance are available to young entrepreneurs in all regions, not just urban locales. This study theoretically underscores the significance of multidimensional models integrating behavioral and technology viewpoints. It indicates that only enhancing digital literacy is inadequate; psychological empowerment and practical application must coexist to promote sustained young entrepreneurship in Indonesia's digital economy.

6. Conclusion

This research successfully develops and tests an integrated theoretical model between the TPB and the UTAUT in explaining the digital entrepreneurial behavior of Indonesian students who run social media-based businesses. The results of testing 322 respondents showed that most of the hypotheses in this research model were significantly supported. The findings reveal that psychological factors such as attitudes towards digital businesses and perceived behavioral control, as well as technological factors such as performance expectancy and effort expectancy, contribute significantly to the adoption of social media for business purposes. Furthermore, attitudes, behavior control, performance expectations, and social media adoption significantly affect students' digital entrepreneurial behavior. However, effort expectancy has not been shown to directly affect digital entrepreneurial behavior, indicating that the ease of use of technology plays a more significant role in the early adoption stage than in encouraging real action in digital business. Overall, the results of this study confirm the importance of integrating psychological motivation with technological readiness in building a sustainable digital entrepreneurship ecosystem among the younger generation. Integrating TPB and UTAUT can enrich understanding of the factors influencing digital entrepreneurial behavior in the digital transformation era. Practically, these results provide important implications for developing digital entrepreneurship curricula and higher education policy interventions that can simultaneously accommodate technological readiness and encourage student entrepreneurial motivation.

Although this study provides valuable contributions, several limitations remain. The sample was limited to students with social media business experience, reducing generalizability to broader populations. The quantitative online survey also limits insights into deeper motivations and contextual dynamics. In addition, subjective norms, facilitating conditions, and platform-specific differences (e.g., instagram, tiktok, whatsapp) were not analyzed. Lastly, the cross-sectional design prevents examination of behavioral changes over time. Future studies should address these gaps through broader samples, mixed methods, and longitudinal approaches.

Based on these limitations, several directions for future research are recommended. First, broaden the respondent scope beyond student entrepreneurs to include prospective entrepreneurs, MSME actors, and individuals from diverse geographic and educational backgrounds. Second, adopt a mixed-methods approach by combining quantitative surveys with qualitative techniques such as interviews or case studies to capture deeper psychological and social dynamics. Third, extend the model by incorporating additional variables such as subjective norms, facilitating conditions, digital literacy, and entrepreneurship education. Fourth, apply longitudinal designs to observe changes in attitudes, intentions, and behaviors over time, offering a more realistic view of entrepreneurial development. Finally, conduct comparative analyses of different social media platforms (e.g., instagram, tiktok, whatsapp) to provide sharper insights into their relative effectiveness in supporting digital business activities.

7. Declarations

7.1. Author Contributions

Conceptualization: E.D.L., F.K.; Methodology: E.D.L., D.N.; Software: A.Y.K.; Validation: F.K., H.B.; Formal Analysis: E.D.L.; Investigation: D.N., A.Y.K.; Resources: H.B.; Data Curation: D.N.; Writing – Original Draft Preparation: E.D.L.; Writing – Review and Editing: F.K., H.B.; Visualization: A.Y.K.; All authors have read and agreed to the published version of the manuscript.

7.2. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

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The authors received no financial support for the research, authorship, and/or publication of this article.

7.4. Institutional Review Board Statement

Not applicable.

7.5. Informed Consent Statement

Not applicable.

7.6. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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