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ANALYZING THE MODERATING ROLE OF ENTREPRENEURSHIP EDUCATION ON ENTREPRENEURIAL BEHAVIOR: A THEORY OF PLANNED BEHAVIOR (TPB) – BASED STUDY OF MSMEs IN MEDAN, INDONESIA

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ABSTRACT

This study aims to analyze the moderating role of entrepreneurship education on entrepreneurial behavior based on the Theory of Planned Behavior (TPB) among 400 MSME actors in Medan City. The data were analyzed using Structural Equation Modeling (SEM) with a Partial Least Squares (PLS) approach via SmartPLS version 4. The results show that entrepreneurship education significantly moderates the influence of attitude and perceived behavioral control on entrepreneurial behavior, but does not moderate subjective norms and entrepreneurial intention. These findings highlight the importance of entrepreneurship education programs that focus on shaping positive attitudes and enhancing self-control perceptions to foster entrepreneurial behavior among MSMEs. The government and related institutions are advised to develop sustainable mentoring programs and access to capital as tangible support for MSME actors, while the entrepreneurs themselves are encouraged to actively participate in entrepreneurship training to enhance business capacity and competitiveness amid market dynamics. This study is limited to the Medan City area and relies on subjective perception data; therefore, future research is recommended to expand the geographical scope and adopt qualitative methods for deeper understanding.

KEYWORDS: Entrepreneurship Education, Theory of Planned Behavior, Entrepreneurial Behavior.

1. INTRODUCTION

Indonesia faces a structural challenge with a high unemployment rate that has the potential to hinder the nation's economic growth. According to official data from the Central Statistics Agency (BPS) and various government reports, developing the entrepreneurship sector is viewed as a key strategy to address this issue. Entrepreneurship not only has the capacity to create new jobs but also to drive innovation and strengthen an economy based on self-reliance. However, the level of entrepreneurial participation in Indonesia has yet to meet the targets set by the government, necessitating more serious efforts to enhance the role of entrepreneurs in economic development.

Data on Indonesia's entrepreneurship ratio and comparisons with ASEAN countries are reported by various official sources and media outlets. Beritasatu.com noted that in November 2021, Indonesia's entrepreneurship ratio stood at 3.47%, significantly lower than Singapore's 8.76%, Malaysia's 4.74%, and Thailand's 4.26%. Liputan6.com confirmed similar figures in April 2021, citing Minister of Cooperatives and SMEs Teten Masduki who highlighted Indonesia's low entrepreneurship ratio relative to neighboring countries. In March 2025, Kontan.co.id reported that Trade Minister Budi Santoso stated Indonesia's entrepreneurship ratio was 3.57%, while Malaysia and Thailand had surpassed 4%, and Singapore was around 8.6%. Detik.com, in July 2023, quoted Deputy Speaker of the Indonesian People's Consultative Assembly (MPR) Lestari Moerdijat confirming Indonesia's entrepreneurship ratio of only 3.47%, far behind other ASEAN nations. Collectively, these data indicate that Indonesia still faces significant challenges in increasing its number of entrepreneurs, which could hinder economic growth if not promptly addressed.

According to the Global Entrepreneurship Index (GEI), Indonesia ranks 75th out of 137 countries with a score of 26, indicating a relatively low entrepreneurial capacity on a global scale. This ranking lags behind other ASEAN countries, suggesting that Indonesia's entrepreneurial potential remains underutilized. Such conditions obstruct inclusive and sustainable economic growth due to the limited number of quality entrepreneurs and an underdeveloped supporting ecosystem. This reality underscores the urgent need for more effective interventions to foster entrepreneurial spirit, especially among youth and MSME actors in promising areas such as Medan.

Entrepreneurship education serves as a primary

driver in developing entrepreneurial intention. According to Ajzen's (2005) Theory of Planned Behavior (TPB), this intention is shaped by three core constructs: 1) Attitude toward the behavior; 2) Subjective norms ;3) Perceived behavioral control. Studies (Martin-Navarro et al., 2023; Yesmin et al., 2024) confirm that these three constructs act as vital mediators connecting external factors, such as social support and education, to the actual intention to start a business. Research by Nengseh, Kurniawan, and Praswati highlights that self-efficacy is a crucial link that bridges entrepreneurship education with an individual's psychological inclination to become an entrepreneur. Empirical evidence from 2021 to 2024 reinforces TPB as a robust framework for understanding how internal mindsets and external environments interact to drive entrepreneurial behavior. However, most previous research has focused on the mediating role within the TPB framework, with less attention given to entrepreneurship education as a moderating variable. In fact, entrepreneurship education has the potential to strengthen the relationships between TPB constructs (attitude, subjective norm, perceived behavioral control, and intention) and entrepreneurial behavior. This is particularly relevant for MSME actors in Medan, who still face challenges such as low entrepreneurship literacy and weak orientation toward new business creation.

Based on this literature gap, the present study poses the main research question: Does entrepreneurship education moderate the influence of attitude, subjective norm, perceived behavioral control, and entrepreneurial intention on entrepreneurial behavior? The objective of this study is to analyze the moderating role of entrepreneurship education within the relationships among TPB constructs and entrepreneurial behavior among MSMEs in Medan. This research employs a quantitative approach using a modified Theory of Planned Behavior framework along with moderation analysis to examine the effect of entrepreneurship education. Academically, this study aims to enrich the theoretical understanding of entrepreneurial intention and behavior formation, especially within a local context that has been underexplored. Practically, the findings are expected to serve as a basis for formulating more targeted policies in designing entrepreneurship curricula, training, and contextual MSME empowerment programs in Medan and similar regions.

2. LITERATURE REVIEW

2.1. Development of the Theory of Planned

Behavior

The Theory of Planned Behavior (TPB) was first introduced by Icek Ajzen in 1985 through his article titled "From Intentions to Actions: A Theory of Planned Behavior." This theory is an extension of the Theory of Reasoned Action (TRA), which was initially proposed by Martin Fishbein and Icek Ajzen in 1975. TRA itself is rooted in various attitude theories such as learning theories, expectancy-value theories, consistency theories, and attribution theory. According to TRA, if a person evaluates a behavior positively (attitude), and believes that significant others expect them to perform that behavior (subjective norm), this will increase their intention (motivation) to act, thereby making it more likely that the behavior will occur. The strong relationship between attitudes and subjective norms toward behavioral intention, as well as between intention and actual behavior, has been confirmed in many studies.

However, there is a counterargument stating that the relationship between behavioral intention and actual behavior is not always strong. Some studies show that intention does not always lead to actual action due to situational limitations. Because intention alone cannot be the sole determinant of behavior when individuals do not have full control over it, Ajzen introduced the Theory of Planned Behavior by adding a new component called "perceived behavioral control" (PBC). This addition expanded TRA to include behaviors that are not entirely volitional, aiming to predict behavioral intention and actual behavior more accurately.

The development of TPB began with TRA, which explains that a person's behavior is influenced by intention formed from two main factors: attitude toward the behavior and subjective norm (social pressure). However, TRA has limitations in explaining behaviors that are not fully under individual control. Therefore, in 1985, Ajzen developed TPB by adding the Perceived Behavioral Control (PBC) construct, which reflects the extent to which an individual feels capable of and has control over performing the behavior.

The Theory of Planned Behavior is a widely used social psychology theory to understand individual intentions and behaviors. TPB states that a person's intention to perform a behavior is influenced by three main constructs: attitude toward the behavior, subjective norm, and perceived behavioral control (PBC).

In the context of entrepreneurship, attitude reflects an individual's positive or negative evaluation of entrepreneurial activities; subjective

norm refers to social pressure from environments such as family, friends, or community; and PBC relates to the individual's perception of their ability to control and execute entrepreneurial behavior. Various studies have shown that these three factors significantly influence entrepreneurial intention (Che Nawi *et al.*, 2022; Maydiantoro *et al.*, 2021; Muda *et al.*, 2025).

Subjective norm tends to be more dominant in developing countries with collectivist cultures, where social pressure and group support are key factors in decision-making (Urban, 2017; Maslakci *et al.*, 2024; Maydiantoro *et al.*, 2021). However, a meta-analysis by La Barbera & Ajzen (2020) revealed that the influence of subjective norm on intention can weaken when PBC is high, indicating that the role of subjective norm may vary depending on context and individual control perceptions.

Perceived Behavioral Control (PBC) not only influences intention but also directly affects behavior, especially when individuals feel capable of overcoming obstacles and have the necessary resources (Ajzen, 2020; Conner & Norman, 2021). The variable of self-efficacy – belief in one's own ability – is often associated with PBC and has been shown to strengthen the prediction of entrepreneurial intention and behavior (Praswati *et al.*, 2022; Setiaji, 2019; Yesmin *et al.*, 2024).

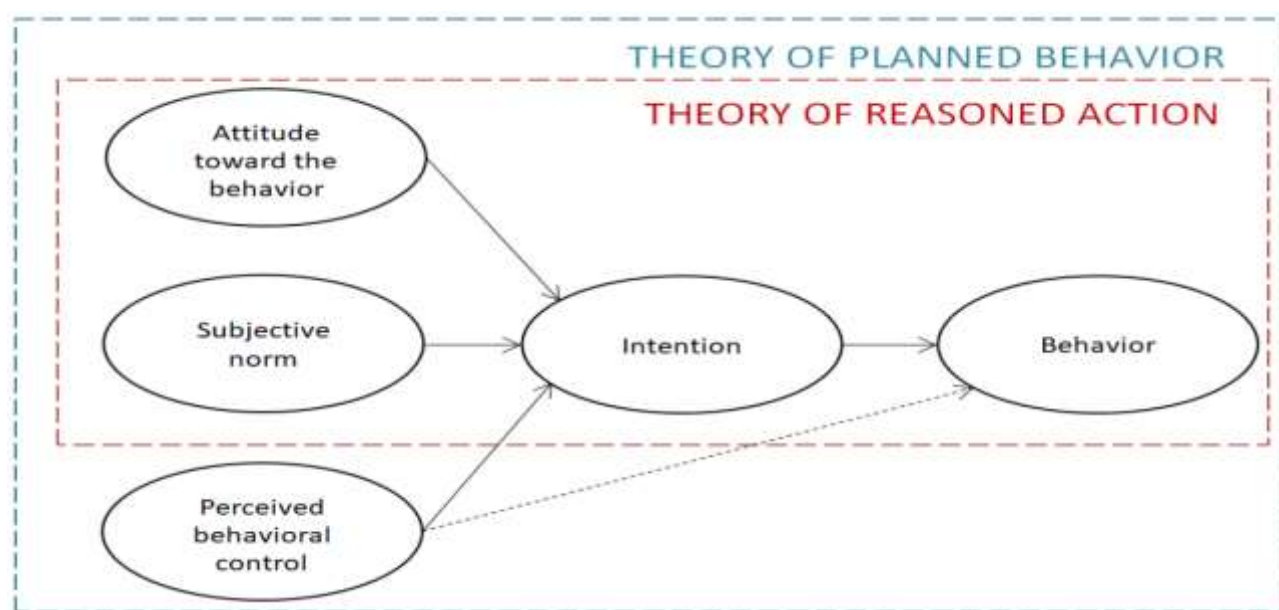
Entrepreneurship education plays a crucial role in shaping and reinforcing the three TPB constructs, particularly by enhancing positive attitudes, perceived behavioral control, and self-efficacy (Juyanto & David, 2022; Sutrisno *et al.*, 2023; Huang & Kee, 2024). However, the influence of education can be direct or indirect, with mediating variables such as opportunity recognition, entrepreneurial mindset, and motivation also affecting these relationships (Mukhtar *et al.*, 2021; Tahan, 2025; Nengseh & Kurniawan, 2021).

Overall, TPB provides a strong and flexible conceptual framework for understanding entrepreneurial intentions and behavior. This theory can be adapted by incorporating additional variables according to context, such as entrepreneurship education, social support, practical experience, and individual characteristics.

Recent research indicates that integrating these variables can improve the accuracy of predicting entrepreneurial intention and provide a solid foundation for developing effective entrepreneurship policies and educational programs (Leong *et al.*, 2023; Anjum *et al.*, 2024; Ripollés & Blesa, 2023).

The Theory of Planned Behavior can be illustrated

as follows:



Sumber: Ajzen, I. (1991). *Organizational Behavior and Human Decision Processes*, 50, P. 179-211.

Figure 1: The Expanded Theory of Planned Behavior (TPB).

Description:

1. Attitude Toward the Behavior

Attitude toward the behavior refers to an individual's positive or negative evaluation of a specific action. This evaluation is formed based on beliefs about the expected consequences of the behavior and an assessment of the value or benefit gained—whether considered advantageous or detrimental.

A positive attitude toward an action increases the likelihood that the individual intends to perform the behavior, while a negative attitude reduces the probability of such intention.

For example, a person who believes that regular exercise brings health benefits and regards it positively tends to have a supportive attitude toward exercising. Within the Theory of Planned Behavior framework, attitude is a primary predictor of behavioral intention, which acts as a direct motivator in decision-making. Numerous empirical studies confirm that consistent and strong attitudes toward a behavior significantly contribute to intention formation and the actual enactment of the behavior, making attitude change a common focus in behavioral interventions.

2. Subjective Norm

Subjective norm is defined as an individual's perception of social pressure or expectations from important people in their environment—such as

family, friends, or colleagues—to perform or avoid a behavior. This component reflects social influence affecting the individual's intention by urging them to comply with social expectations or norms prevailing in the reference group. If a person feels that significant others expect them to perform a certain behavior, the subjective norm will strengthen their intention to do so. Subjective norm plays a crucial role in social contexts, especially for individuals who highly value social acceptance and opinion. Research also shows that the influence of subjective norm may vary depending on cultural context and type of behavior, yet it remains an integral factor in the Theory of Planned Behavior model.

3. Perceived Behavioral Control (PBC)

Perceived behavioral control refers to the extent to which individuals feel they have the ability, resources, and opportunities to perform a particular action, including their perception of the difficulty or ease of performing that behavior.

This concept closely relates to self-efficacy in psychology, which is a person's belief in their capability to control actions and situations they face. Perceived control directly influences intention—the higher the perceived control, the greater the likelihood of intending to perform the behavior. Furthermore, perceived behavioral control can also directly affect behavior without mediation by intention, especially when this control reflects real barriers or significant ease of execution.

Thus, even if an individual has strong intention, if they feel incapable or lacking control, the behavior might not materialize. This component adds an important dimension that distinguishes the Theory of Planned Behavior from the Theory of Reasoned Action.

4. Behavioral Intention (Intention)

Behavioral intention, or simply intention, is the main indicator of an individual's motivation to carry out a specific action. Intention reflects readiness and commitment to act, serving as a direct predictor of the behavior that will be performed.

The formation of intention is influenced by attitude toward the behavior, subjective norm, and perceived behavioral control, representing the integration of internal and external factors in the decision-making process.

As a key mediator between psychological factors and actual behavior, intention is a necessary condition for behavior to occur; although a person may have positive attitudes, social pressure, and feel capable, the behavior will not occur without a strong intention. Therefore, in behavioral studies, intention measurement is often used as an early indicator to predict behavior.

5. Behavior

Behavior is the actual action performed by an individual as a manifestation of their intention and perceived behavioral control.

In the Theory of Planned Behavior framework, behavior is the final outcome predicted by the interaction between attitude, subjective norm, and perceived behavioral control that shape intention. Behavior can be a direct action, habit, or response to a particular situation.

However, performing behavior does not always occur automatically even if intention has formed, due to external constraints such as time limitations, resources, or other situational barriers. Therefore, understanding behavior requires consideration not only of internal motivation but also the capacity and opportunity available to the individual. This model is very useful in designing effective intervention strategies by addressing both motivational and barrier aspects in behavior change.

2.2. The Evolution of the Theory of Planned Behavior

The Theory of Planned Behavior (TPB) is a widely used social psychology framework designed to understand the formation of individual intentions and behaviors. Its conceptual foundation lies in the

Theory of Reasoned Action (TRA), proposed by Fishbein and Ajzen in 1975, which posits that an individual's behavior is primarily driven by their intention. Under TRA, this intention is formed by two main factors: attitude toward the behavior (a positive or negative evaluation of the action) and subjective norms (perceived social pressure from significant others).

However, TRA has a fundamental limitation: it assumes that behavior is entirely under an individual's volitional control and does not account for external constraints or the actual ability to perform the action.

Recognizing that intention alone cannot determine behavior when individuals face situational or technical barriers, Ajzen extended the model in 1985 to create the Theory of Planned Behavior.

The defining advancement of TPB is the addition of Perceived Behavioral Control (PBC). PBC reflects an individual's perception of the ease or difficulty of performing a behavior, encompassing their access to necessary resources, opportunities, and belief in their own capabilities (self-efficacy). This third construct allows the model to predict behaviors that are not fully volitional more accurately.

In the TPB framework, PBC serves a dual role: it influences behavior indirectly by strengthening behavioral intention, and it can also affect actual behavior directly, particularly when it reflects real-world facilitators or barriers to execution. By integrating these three components—attitude, subjective norms, and PBC—TPB provides a comprehensive lens for analyzing how psychological and environmental factors culminate in action.

2.3. Entrepreneurship Education

Numerous studies have confirmed that entrepreneurship education plays a fundamental role in shaping entrepreneurial interest, intention, and capability—both among university students and the general population.

This form of education not only delivers conceptual knowledge but also builds practical competencies and adaptive mindsets necessary to navigate dynamic and uncertain business environments.

Research by Sutrisno, Prabowo, and Kurniawan (2023) demonstrates that entrepreneurship education, when combined with the use of social media, significantly enhances students' entrepreneurial interest.

This approach is grounded in the integration of the Theory of Planned Behavior (TPB) and Social

Media Use Theory, highlighting the importance of cognitive and social dimensions in forming entrepreneurial intentions. In this context, education provides the conceptual foundation and technical skills, while social media functions as a social ecosystem that amplifies exposure to entrepreneurial norms and role models.

Furthermore, a study by Nengseh and Kurniawan (2021) underscores the role of self-efficacy as a key mediating variable in the relationship between entrepreneurship education and entrepreneurial interest.

This finding aligns with research by Praswati, Purnama Sari, and Murwanti (2022), who identified self-efficacy as the psychological bridge linking entrepreneurial learning experiences to the formation of entrepreneurial intentions. Thus, education not only directly enhances interest, but also indirectly strengthens individuals' belief in their own entrepreneurial abilities.

Social and personal environmental factors are also recognized as critical determinants in the effectiveness of entrepreneurship education. Maslakci, Sürücü, and Harun (2024) emphasize that institutional support and social norms significantly influence entrepreneurial intentions.

Meanwhile, Yesmin et al. (2024) add that educational and social support positively correlate with the components of TPB, including attitudes, subjective norms, and perceived behavioral control, and further contribute to the enhancement of self-efficacy.

The application of TPB as a theoretical framework has been widely adopted in entrepreneurship research due to its explanatory power in linking psychological constructs to actual behavior. Setiaji (2019) and Prabandari & Sholihah (2015) argue that attitudes toward entrepreneurship, subjective norms, and perceived behavioral control are variables that can be effectively shaped through educational interventions to foster entrepreneurial intentions.

On a broader scale, entrepreneurship education has also been shown to impact business performance. A study by Liu, Yang, and Singhdong (2024) indicates that entrepreneurship education contributes to improved entrepreneurial performance indirectly through enhanced entrepreneurial competencies, with the dynamics of the business environment acting as a moderating factor.

Anjum et al. (2024) and Chen (2024) highlight that the effectiveness of entrepreneurship education is significantly improved when complemented by

supportive interventions such as business incubators and reinforced by personal characteristics such as a proactive personality.

These findings illustrate that the success of entrepreneurship education depends on the synergy among instructional, environmental, and psychological factors.

2.4. Entrepreneurship Education within the TPB Framework

Within the TPB framework, entrepreneurship education can be understood as an external determinant influencing the model's three core components: attitude toward the behavior, subjective norms, and perceived behavioral control.

Several studies have found that entrepreneurship education strengthens positive attitudes toward entrepreneurship, increases perceived behavioral control, and enhances self-efficacy (Sutrisno et al., 2023; Nengseh & Kurniawan, 2021; Juyanto & David, 2022; Setiawan et al., 2024).

In addition, studies by Anjum et al. (2024) and Shah et al. (2020) suggest that entrepreneurship education may act as a moderating variable, reinforcing the relationship between TPB components and entrepreneurial intention. However, findings from Hartono et al. (2022) indicate that the effect of education is not direct and becomes significant only when mediated by attitude, subjective norms, and perceived behavioral control.

This suggests that entrepreneurship education should not focus solely on cognitive aspects but must also address the affective and conative domains of learners.

Overall, empirical literature supports the argument that entrepreneurship education serves as more than a vehicle for knowledge transfer; it is a strategic instrument in shaping intention, motivation, self-efficacy, and practical entrepreneurial competence. Educational approaches integrated with the TPB framework and which account for personal and environmental dynamics have proven effective in cultivating individuals ready to face entrepreneurial challenges.

Consequently, the development of entrepreneurship curricula and educational policies must be designed holistically, contextually, and applicatively to yield tangible impacts on entrepreneurial behavior.

Based on theoretical concepts and previous research findings supporting the development of the Theory of Planned Behavior (TPB) model by incorporating entrepreneurship education as a moderating variable the conceptual framework of

this study can be illustrated as follows:

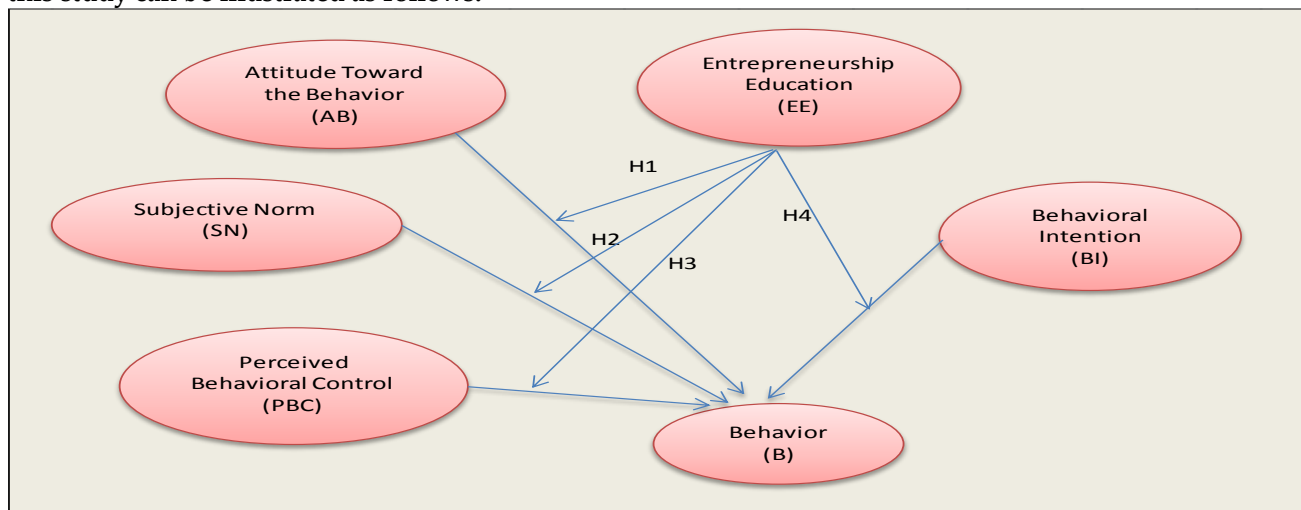


Figure 2: Conceptual Framework.

3. METHOD

This study employs a quantitative method as it enables the statistical and objective testing of relationships between variables. This approach is particularly suitable for measuring the moderating effect of entrepreneurship education within the Theory of Planned Behavior (TPB) model. Additionally, the method supports the use of Structural Equation Modeling Partial Least Squares (SEM-PLS) techniques to comprehensively test the structural model.

The research sample consisted of 400 Micro, Small, and Medium Enterprises (MSMEs) operators in Medan City. Respondents included active entrepreneurs from various business sectors, characterized by productive age, entrepreneurial experience, and diverse educational backgrounds. The study assumes that respondents understand the survey questions well and answer honestly, and that the entrepreneurship education they have received varies in intensity sufficiently to moderate the relationships among variables within the TPB model.

4. RESULTS AND DISCUSSION

4.1. Overview Of Medan City

Medan City, located on the eastern coast of Sumatra Island near the Strait of Malacca, holds a strategic position as a hub for both national and international trade. With a lowland topography approximately 25 meters above sea level and a tropical climate, Medan supports agricultural activities, although it is prone to flooding during the rainy season. The Deli and Babura Rivers serve as main water sources and have traditionally functioned as important transportation routes.

As the capital of North Sumatra Province, Medan has experienced rapid growth, with a population of approximately 2.5 million people, driven by urbanization and ethnic diversity—including Batak, Javanese, Malay, and Chinese communities. Population growth is uneven, with certain districts expanding quickly while the city center tends to stagnate.

The Open Unemployment Rate (OUR) significantly decreased from 10.74% in 2020 to 8.13% in 2024, thanks to economic recovery, investment, infrastructure development, and job training programs. Micro, Small, and Medium Enterprises (MSMEs) remain the backbone of the local economy, with 38,343 business units recorded in 2022, mainly in the sectors of trade, culinary, fashion, automotive, and agriculture.

Medan holds strong potential for sustainable economic development, supported by its geographic location and rapid urban growth. However, the city also faces challenges such as infrastructure limitations, structural unemployment, and spatial planning pressures, requiring adaptive policies and long-term planning.

4.2. Respondent Characteristics

Business actors in Medan come from diverse backgrounds in terms of age, gender, education, and experience, reflecting cross-generational entrepreneurship. The majority of business owners are between 50–59 years old, with extensive business experience, followed by those aged 40–49 who possess managerial skills, and younger entrepreneurs aged 30–39 who tend to be more innovative. Female participation is more prominent in flexible sectors such as culinary and digital

businesses, while males dominate traditional, large-scale enterprises.

Respondents' educational levels vary, with most having completed high school or vocational school and relying on practical skills. Meanwhile, university graduates are more active in the service and technology sectors. Business experience generally ranges from 5 to 10 years, with a significant proportion of beginner entrepreneurs. Those with more than 10 years of experience demonstrate greater business resilience.

The main business sectors include trade, culinary, and services, followed by processed food, workshops, handicrafts, and digital technology. Most businesses are micro-scale, operating with limited capital and labor, and are often family-run with informal management structures.

Most business locations are situated in the city center to facilitate market access, although suburban areas offer lower operating costs. Funding is mainly sourced from financial institutions and personal capital, while the use of grants remains minimal.

Many businesses still operate informally without a Business Identification Number (NIB), limiting their access to government programs and assistance. Direct cash assistance from the government has also not yet optimally reached these entrepreneurs.

In terms of income, most business owners earn more than IDR 100 million per year, although there are still some earning below that figure. While not all have prior entrepreneurial experience, several respondents have participated in training or mentoring programs, indicating strong entrepreneurial growth potential in Medan City.

4.3. Model Measurement Results (Outer Model)

Convergent validity means that indicators within one construct are highly correlated (Ghozali & Latan, 2015). The evaluation is conducted using the Average Variance Extracted (AVE) with an ideal value of ≥ 0.5 , indicating that the construct can explain at least 50% of the variance of its indicators (Wong, 2013; Sarstedt et al., 2017).

Table 1: Average Variance Extracted (Ave).

Konstruk	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
AB	0.917	0.918	0.931	0.601
B	0.940	0.940	0.949	0.650
BI	0.922	0.923	0.935	0.617
EE	0.926	0.929	0.937	0.600
PBC	0.956	0.957	0.962	0.739
SN	0.927	0.928	0.938	0.605

Source: Data Processed Using SEM-PLS

Based on the table, the AVE values for all variables—attitude toward behavior, subjective norm, perceived behavioral control, entrepreneurship education, behavioral intention, and behavior—are all above 0.5, indicating good convergent validity and the latent variables' ability to explain more than 50% of the variance in their indicators.

B) Fornell-Larcker Criterion

Table 2: The Square Root of AVE Value.

Konstruk	AB	B	BI	EE	PBC	SN
AB	0.775					
B	0.370	0.806				
BI	0.447	0.431	0.786			
EE	0.793	0.359	0.471	0.774		
PBC	0.172	0.542	0.257	0.131	0.860	
SN	0.488	0.347	0.434	0.518	0.142	0.778

Source: Data Processed Using SEM-PLS

Based on the table, the square root of the AVE for each variable is greater than its correlation with other variables. For example, the variable attitude toward the behavior has a square root AVE of 0.775, which is higher than its correlation with behavior (0.370),

behavioral intention (0.447), entrepreneurship education (0.793), self-efficacy (0.368), perceived behavioral control (0.172), and subjective norm (0.488).

3. Reliability Testinga) Cronbach's Alpha

Reliability testing was conducted using Cronbach's Alpha, which reflects the internal

consistency of all indicators within the model. A minimum value of 0.7 is considered acceptable, while ideal values are 0.8 or 0.9 (Ghozali, 2016).

Table 3: Cronbach's Alpha and Composite Reliability Values.

Konstruk	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
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PBC	0.956	0.957	0.962	0.739
SN	0.927	0.928	0.938	0.605

Source: Data Processed Using SEM-PLS

Based on the table above, the Cronbach's Alpha values for the variables attitude toward the behavior, subjective norm, perceived behavioral control, entrepreneurship education, behavioral intention, and behavior are all above 0.7, indicating that all constructs are reliable.

B) Composite Reliability

Some experts argue that cross loading and the Fornell-Larcker criterion are not sufficiently sensitive in assessing discriminant validity. As an alternative, the HTMT (Heterotrait-Monotrait ratio), which is

based on the multitrait-multimethod matrix, is recommended. A value below 0.90 is required to confirm discriminant validity between reflective constructs (Henseler et al., 2015).

A) Inner VIF

Multicollinearity occurs when two or more independent variables are highly correlated, which can weaken the predictive power of the model (Sekaran & Bougie, 2016). A VIF value below 5 indicates that there is no multicollinearity among the constructs (Sarstedt et al., 2017).

Table 4: Vif Value.

Konstruk	VIF
AB -> B	2.938
BI -> B	1.513
PBC -> B	1.121
SN -> B	1.676
EE x AB -> B	1.676
EE x SN -> B	2.299
EE x BI -> B	1.661
EE x PBC -> B	1.465

Source: Data Processed Using SEM-PLS

The VIF values for all variables – such as attitude, subjective norm, perceived behavioral control, and entrepreneurship education – are all below 5, indicating that there is no multicollinearity issue.

B) R Square

The coefficient of determination (R^2) is used to

measure how much of the variance in the endogenous construct is explained by the exogenous constructs. R^2 values range from 0 to 1, with the following criteria: 0.75 = substantial, 0.50 = moderate, 0.25 = weak (Sarstedt et al., 2017), and 0.67 = substantial, 0.33 = moderate, 0.19 = weak (Chin, as cited in Ghozali & Latan, 2015).

Table 5: R-Square and Adjusted R-Square Values

Konstruk	R-square	R-square adjusted
B	0.468	0.452
BI	0.297	0.290

Source: Data Processed Using SEM-PLS

The Adjusted R Square value indicates that 45.2% of the variation in entrepreneurial behavior can be explained by attitude, subjective norm, perceived behavioral control, self-efficacy, and entrepreneurial intention, while the remaining 54.8% is influenced by other factors outside the scope of this study. Meanwhile, 29% of the variation in entrepreneurial

intention is explained by attitude, subjective norm, and perceived behavioral control, with the remaining 71% accounted for by other unexamined variables.

5. Hypothesis Testing

Hypothesis testing is a crucial step in quantitative research to determine whether the assumed

relationships between variables (hypotheses) are statistically supported. The goal is to assess whether

the effects observed in the sample can also be generalized to the population.

Table 6: Original Sample (O) Values and T Statistics.

Konstruk	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ($ O/STDEV $)	P values	Keterangan
EE x AB -> B	0.086	0.085	0.037	2.311	0.021	Support
EE x SN -> B	-0.104	-0.109	0.042	2.493	0.013	Not Support
EE x BI -> B	-0.154	-0.156	0.042	3.701	0.000	Support
EE x PBC -> B	0.120	0.124	0.053	2.253	0.024	Not Support

Source: Data Processed Using SEM-PLS

Explanation: AB = Attitude Toward the Behavior, SN = Subjective Norm, PBC = Perceived Behavioral Control, EE = Entrepreneurship Education, BI = Behavioral Intention, B = Behavior

Based on the analysis results, it was found that entrepreneurship education plays a significant moderating role on the influence of attitude (AB), subjective norm (SN), behavioral intention (BI), and perceived behavioral control (PBC) on entrepreneurial behavior.

- 1) Hypothesis Test 1: Entrepreneurship education can moderate the influence of attitude on entrepreneurial behavior in the community of Medan City. Based on the table above, entrepreneurship education is proven to moderate (strengthen) the influence of attitude on entrepreneurial behavior, with a coefficient of 0.086. This indicates that the presence of entrepreneurship education increases the impact of an individual's positive attitude on the realization of entrepreneurial actions. The t-statistic value = 2.311 > 1.96 and p-value = 0.021 < 0.05, so H_0 is rejected and H_1 is accepted. This means entrepreneurship education can positively and significantly moderate (strengthen) the influence of attitude on entrepreneurial behavior in the community of Medan City. Thus, Hypothesis 1 is accepted.
- 2) Hypothesis Test 2: Entrepreneurship education can moderate the influence of subjective norm on entrepreneurial behavior in the community of Medan City. Based on the table above, entrepreneurship education is not proven to moderate the influence of subjective norm on entrepreneurial behavior, with a coefficient of -0.109. This means the presence of entrepreneurship education weakens the impact of subjective norm on entrepreneurial behavior. The t-statistic value = 2.493 > 1.96 and p-value = 0.013 < 0.05, so H_0 is accepted and H_1 is rejected. This means entrepreneurship education cannot positively moderate the influence of subjective norm on entrepreneurial behavior in the community of Medan City. Thus, Hypothesis 2 is rejected.
- 3) Hypothesis Test 3: Entrepreneurship education can moderate the influence of

perceived behavioral control on entrepreneurial behavior in the community of Medan City.

Based on the table above, entrepreneurship education is proven to moderate (strengthen) the influence of perceived behavioral control on entrepreneurial behavior, with a coefficient of 0.120. This means the presence of entrepreneurship education strengthens the influence of perceived behavioral control on entrepreneurial behavior. The t-statistic value = 2.253 > 1.96 and p-value = 0.024 < 0.05, so H_0 is rejected and H_1 is accepted. This means entrepreneurship education can positively and significantly moderate (strengthen) the influence of perceived behavioral control on entrepreneurial behavior in the community of Medan City. Thus, Hypothesis 3 is accepted.

4) Hypothesis Test 4: Entrepreneurship education can moderate the influence of behavioral intention on entrepreneurial behavior in the community of Medan City. Based on the table above, entrepreneurship education is not proven to moderate (strengthen) the influence of behavioral intention on entrepreneurial behavior, with a coefficient of -0.154. This means the presence of entrepreneurship education weakens the influence of behavioral intention on entrepreneurial behavior. The t-statistic value = 3.701 > 1.96 and p-value = 0.000 < 0.05, so H_0 is accepted and H_1 is rejected. This means entrepreneurship education cannot positively and significantly moderate (strengthen) the influence of behavioral intention on entrepreneurial behavior in the community of Medan City. Thus, Hypothesis 4 is rejected.

5. DISCUSSION

Entrepreneurship education is a strategic catalyst designed to foster entrepreneurial intention—the cognitive representation of an individual's readiness to perform entrepreneurial behavior. Attitude Toward the Behavior:

The degree to which a student evaluates the prospect of starting a business as favorable or unfavorable. Education aims to shift this perception

by highlighting the rewards and personal fulfillment of entrepreneurship. The perceived social pressure from influential figures (parents, peers, or mentors). Entrepreneurial ecosystems within universities can strengthen these norms by creating a supportive community.

The perceived ease or difficulty of becoming an entrepreneur. This is often closely linked to Self-Efficacy, or the belief in one's capability to execute the necessary tasks for business success.

Recent scholarly work (2021–2024) provides deeper nuance into how these constructs interact within educational settings:

Research by Martin-Navarro *et al.* (2023) and Yesmin *et al.* (2024) suggests that entrepreneurship education does not always lead directly to intention. Instead, it works by first improving a student's *attitude* and *perceived control*, which then "mediates" or carries the impact over to their final *intention* to start a business.

As noted by Nengseh, Kurniawan, and Praswati, self-efficacy acts as the critical "missing link." Education provides the skills, but unless the student feels a boost in their self-efficacy (their internal confidence), the educational input may not successfully translate into a strong entrepreneurial inclination.

The consistent validation of TPB in recent years confirms it as the gold standard for educators and researchers to measure the effectiveness of entrepreneurship programs.

1. The Moderating Role of Entrepreneurship Education (EE) on Attitude (AB)
 - a. The results demonstrate that entrepreneurship education significantly strengthens the relationship between a positive attitude and actual entrepreneurial behavior. This suggests that for MSME actors in Medan, formal or informal training serves as a catalyst, transforming a mere favorable disposition toward business into concrete action. This finding aligns with the TPB-based research of Shah *et al.* (2020) and Heuer & Kolvereid (2014), who both identify EE as a critical moderator that enhances the "attitude-to-action" pathway.
 - b. Furthermore, the cognitive development provided by EE helps individuals internalize role models and innovation strategies, a perspective shared by Amofah & Saladrighes (2022) and Tahan (2025). In essence, while a positive attitude provides the initial spark, entrepreneurship education provides the psychological framework and vocational

"know-how" necessary to sustain that drive into actual behavior.

2. The Moderating Role of EE on Subjective Norms (SN)
 - a. In a departure from much of the existing literature, this study found that entrepreneurship education does not significantly moderate the influence of subjective norms on entrepreneurial behavior. While scholars like Yesmin *et al.* (2024) and Anjum *et al.* (2024) argue that social support and educational programs work synergistically to drive behavior, the data from Medan suggests otherwise.
 - b. A possible explanation for this discrepancy is that in the culturally tight-knit community of Medan, social pressure and family expectations (subjective norms) are already so powerful that educational interventions do little to amplify or diminish their impact. The internal social drive may be independent of formal classroom learning. This contradicts the findings of Shah *et al.* (2020) and Heuer & Kolvereid (2014), suggesting that in certain urban Indonesian contexts, the "referent others" hold a level of influence that remains unaffected by pedagogical moderating factors.
3. The Moderating Role of EE on Perceived Behavioral Control (PBC)
 - a. The findings indicate that EE effectively moderates (strengthens) the influence of Perceived Behavioral Control on entrepreneurial behavior. This confirms that when MSME actors feel they have the capability and resources (PBC), entrepreneurship education further empowers them to act on those beliefs. This result is consistent with Sutrisno *et al.* (2023) and Yesmin *et al.* (2024), who emphasize that EE increases self-efficacy and resource management skills.
 - b. By providing technical skills and strategic knowledge, entrepreneurship education reduces the perceived barriers to entry. As supported by Anjum *et al.* (2024), the interaction between educational programs and the internal sense of control creates a robust foundation for behavioral execution, making the transition from "feeling capable" to "performing the business task" much more seamless.
4. The Moderating Role of EE on Behavioral Intention (BI)
 - a. Interestingly, the research shows that

entrepreneurship education does not significantly moderate the link between behavioral intention and actual behavior. This presents a "knowledge-action gap." While studies by Shah et al. (2020) and Sutrisno et al. (2023) suggest that EE acts as a "booster" that helps turn intentions into actions, our findings in Medan indicate that having the intent to start a business does not necessarily require education to translate into behavior.

- b. This may imply that for MSME actors in this region, the leap from intention to action is driven more by economic necessity or immediate opportunity than by the moderating influence of a curriculum. While the educational framework strengthens the foundations of intention (Attitude and PBC), it does not appear to be the final bridge that moves an individual from "planning" to "doing." This highlights a unique area for future research: identifying what specific external factors, if not education, bridge the intention-behavior gap in the Medan MSME sector.

6. CONCLUSION

Based on the research results and hypothesis testing conducted, several key findings are concluded as follows:

1. Entrepreneurship education has been proven to significantly moderate the relationship between attitude and entrepreneurial behavior. This finding indicates that the higher the level of entrepreneurship education an individual possesses, the stronger the influence of attitude on the tendency to engage in entrepreneurial behavior. This confirms that entrepreneurship education acts as a moderating variable that strengthens this relationship.
2. Entrepreneurship education does not positively moderate the relationship between subjective norms and entrepreneurial behavior. In fact, the presence of entrepreneurship education tends to weaken the influence of subjective norms on entrepreneurial behavior. This suggests that the educational approach used has not yet effectively facilitated the internalization of social norms into entrepreneurial actions.
3. Entrepreneurship education plays a significant moderating role in the

relationship between perceived behavioral control and entrepreneurial behavior. In other words, entrepreneurship education can strengthen individuals' confidence in their ability to perform entrepreneurial actions.

4. Entrepreneurship education is not proven to strengthen the relationship between entrepreneurial intention and entrepreneurial behavior. This may be due to an educational approach that is theoretical and lacks direct practical experience, making it less effective in translating intention into real entrepreneurial actions, especially in the context of Medan City.

7. LIMITATIONS

1. This study was conducted only in Medan City, so the findings may be contextual and cannot be generalized to other regions with different social, economic, and cultural characteristics. Therefore, further research in various regions is needed to test the consistency of the findings.
2. The finding that entrepreneurship education weakens the influence of subjective norms indicates limitations in understanding the role of social norms within the context of entrepreneurship education. Factors such as local culture, social dynamics, and the influence of family and community environments have not been explored in depth.
3. The insignificant moderating role of education on the relationship between intention and entrepreneurial behavior may indicate limitations in the learning approach used. This study has not examined the effectiveness of experiential and application-based learning models, which might be more appropriate for encouraging real entrepreneurial behavior.
4. This study focused solely on entrepreneurship education as a moderator, without considering other external variables such as financial support, access to business networks, mentorship roles, or government policies that could significantly affect entrepreneurial behavior.
5. The quantitative approach used in this study limits a deeper understanding of individual dynamics and social contexts influencing entrepreneurial behavior. Qualitative or mixed-method studies could be an

alternative to enrich perspectives and research.
explain phenomena not revealed in this

REFERENCES

- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckmann (Eds.), *Action control: From cognition to behavior* (pp. 11–39). Springer Verlag.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Amofah, K., & Saladrighes, R. (2022). Entrepreneurship education, role models and intention: A cognitive and social learning perspective. *Journal of Entrepreneurship Education*, 25(6), 1–15.
- Anjum, T., Díaz Tautiva, J. A., Zaheer, A., & Heidler, P. (2024). Entrepreneurship education and cognitive factors: Moderating effects on entrepreneurial intentions and behaviors. *Journal of Innovation and Entrepreneurship*, 13(1), 1–19.
- Chen, H. X. (2024). Exploring the influence of proactive personality on entrepreneurial intention: The mediating role of entrepreneurial attitude and moderating effect of perceived educational support among university students. *SAGE Open*, 14(1), Article 21582440241233379. <https://doi.org/10.1177/21582440241233379>
- Fayolle, A., & Gailly, B. (2015). The impact of entrepreneurship education on entrepreneurial attitudes and intention: Hysteresis and persistence. *Journal of Small Business Management*, 53(1), 75–93. <https://doi.org/10.1111/jsbm.12065>
- Ghozali, I., & Latan, H. (2015). *Partial least squares: Concept, technique, and application using SmartPLS 3.0 for empirical research* [in Indonesian]. Badan Penerbit Universitas Diponegoro.
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135. <https://doi.org/10.1007/s11747-014-0403-8>
- Heuer, A., & Kolvereid, L. (2014). Education in entrepreneurship and the theory of planned behaviour. *European Journal of Training and Development*, 38(6), 506–523. <https://doi.org/10.1108/EJTD-02-2013-0019>
- Iakovleva, T., Kolvereid, L., & Stephan, U. (2011). Entrepreneurial intentions in developing and developed countries. *Education + Training*, 53(5), 353–370. <https://doi.org/10.1108/00400911111147686>
- Karimi, S., Biemans, H. J. A., Lans, T., Chizari, M., & Mulder, M. (2016). The impact of entrepreneurship education: A study of Iranian students' entrepreneurial intentions and opportunity identification. *Journal of Small Business Management*, 54(1), 187–209.
- Krueger, N. F., Reilly, M. D., & Carsrud, A. L. (2000). Competing models of entrepreneurial intentions. *Journal of Business Venturing*, 15(5–6), 411–432. [https://doi.org/10.1016/S0883-9026\(98\)00033-0](https://doi.org/10.1016/S0883-9026(98)00033-0)
- Liñán, F., & Chen, Y.-W. (2009). Development and cross-cultural application of a specific instrument to measure entrepreneurial intentions. *Entrepreneurship Theory and Practice*, 33(3), 593–617. <https://doi.org/10.1111/j.1540-6520.2009.00318.x>
- Martin-Navarro, A., Peña-García, F., & Sánchez-Cañizares, S. (2023). Cognitive antecedents of entrepreneurship: The role of attitude and education. *International Entrepreneurship and Management Journal*. <https://doi.org/10.1007/s11365-023-00862-0>
- Nabi, G., Liñán, F., Fayolle, A., Krueger, N., & Walmsley, A. (2017). The impact of entrepreneurship education in higher education: A systematic review and research agenda. *Academy of Management Learning & Education*, 16(2), 277–299. <https://doi.org/10.5465/amle.2015.0026>
- Nguyen, T. H., Nguyen, D. P., & Nguyen, T. H. (2017). The application of Theory of Planned Behavior to entrepreneurial intentions of Vietnamese students. *Journal of Asian Business Strategy*, 7(3), 113–123.
- Sarstedt, M., Hair, J. F., Cheah, J.-H., Becker, J. M., & Ringle, C. M. (2017). How to specify, estimate, and validate higher-order constructs in PLS-SEM. *Australasian Marketing Journal*, 25(3), 197–211. <https://doi.org/10.1016/j.ausmj.2017.07.001>
- Sarstedt, M., Hair, J. F., Ringle, C. M., Thiele, K. O., & Gudergan, S. P. (2017). Estimation issues with PLS and CBSEM: Where the bias lies! *Journal of Business Research*, 69(10), 3998–4010. <https://doi.org/10.1016/j.jbusres.2016.06.007>
- Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill-building approach* (7th ed.). Wiley.
- Shah, N., Amjed, S., & Jaboo, S. (2020). Moderating role of entrepreneurship education on the theory of planned behaviour: Evidence from developing country. *Journal of Entrepreneurship Education*, 23(3),

1-10.

- Shi, J., Zhao, H., & Zhang, X. (2020). Creativity as a moderator in entrepreneurial intention: The role of perceived behavioral control and subjective norms. *Journal of Business Research*, 115, 237-246. <https://doi.org/10.1016/j.jbusres.2020.05.030>
- Sutrisno, A., Prabowo, H., & Kurniawan, R. (2023). The role of entrepreneurship education and perceived behavioral control on entrepreneurial intention and behavior among university students. *Journal of Entrepreneurship Development*, 25(2), 134-148.
- Tahan, M. (2025). Psychological enablers of entrepreneurship: Innovation, education, and cognitive mechanisms in action. *Journal of Business Psychology and Innovation*, 8(1), 22-35.
- Utami, H. N. (2020). Entrepreneurship education and its impact on entrepreneurial self-efficacy and entrepreneurial intentions among university students. *International Journal of Innovation, Creativity and Change*, 14(3), 620-635. Retrieved from www.ijicc.net
- Wu, S., & Wu, L. (2008). The impact of higher education on entrepreneurial intentions of university students in China. *Journal of Small Business and Enterprise Development*, 15(4), 752-774. <https://doi.org/10.1108/14626000810917843>
- Yesmin, N., Rahman, M., & Alam, S. S. (2024). The synergy of entrepreneurship education and social support in enhancing entrepreneurial intentions: A TPB-based study. *International Journal of Entrepreneurial Behavior & Research*, 30(2), 225-244.