

Entrepreneurial Alertness, Risk-Taking, and Intention Among University Students in East Java: The Moderating Role of Entrepreneurial Knowledge Using PLS-SEM

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Abstract

The Indonesian government actively promotes youth entrepreneurship within higher education institutions to reduce graduate unemployment. This study examines the influence of entrepreneurial alertness and risk tolerance on entrepreneurial intention among university students in East Java, Indonesia, while evaluating the moderating role of entrepreneurial knowledge. Employing a quantitative design, empirical data were collected via a structured questionnaire from 203 students and analyzed using Partial Least Squares–Structural Equation Modeling (PLS-SEM). Structural evaluation reveals that entrepreneurial alertness exerts a statistically significant positive effect on entrepreneurial intention ($\beta = 0.165$; $t = 2.047$; $p = 0.041$), whereas risk tolerance demonstrates no significant impact ($\beta = 0.041$; $t = 0.657$; $p = 0.511$). Entrepreneurial knowledge significantly strengthens the positive relationship between entrepreneurial alertness and entrepreneurial intention ($\beta = 0.312$; $t = 5.141$; $p = 0.000$); however, it fails to moderate the association between risk tolerance and intention ($\beta = 0.088$; $t = 1.171$; $p = 0.242$). Overall, the proposed model explains 48.3% of the variance in entrepreneurial intention ($R^2_{adj} = 0.483$). Theoretically, this research extends Social Cognitive Theory (SCT) by underscoring that cognitive architectures and domain knowledge acquisition predominate over dispositional personality traits in driving entrepreneurial intention.

Keywords: entrepreneurial alertness, entrepreneurial intention, entrepreneurial knowledge, risk tolerance, social cognitive theory

1. INTRODUCTION

Entrepreneurship serves as a vital dynamic catalyst for a nation's macroeconomic growth and structural transformation, primarily orchestrated through the systematic identification and creative configuration of unexploited business opportunities (Ratten, 2023). Within the Indonesian economic landscape, Micro, Small, and Medium Enterprises (MSMEs) function as the foundational backbone of economic resilience, empirically generating 61.9% of the nation's Gross Domestic Product (GDP) and mobilizing approximately 119 million laborers, which accounts for 97% of the total domestic workforce (Otoritas Jasa Keuangan, 2025). However, a severe structural anomaly arises when analyzing Indonesia's aggregate entrepreneurship ratio, which remains critically stagnant at a mere 3.35%. This figure lags significantly behind the competitive socio-economic frameworks of neighboring ASEAN counterparts, such as Malaysia (4.74%) and Singapore (8.76%), as well as developed economies, which maintain an average benchmark of approximately 12% (Azizah, 2024). This empirical disparity underscores an urgent imperative for governments and higher education institutions to evaluate the efficacy of existing pedagogical ecosystems and systematically nurture an entrepreneurial mindset among the youth to catalyze innovation-driven economic transformation (Azizah, 2024).

In the domain of entrepreneurial psychology, entrepreneurial intention stands as the most reliable, validated cognitive proxy for predicting an individual's actual behavioral commitment to launching a new venture. According to a comprehensive systematic literature review by Maheshwari et al. (2023), the antecedents constructing entrepreneurial intention span a multitude of multidimensional fields; however, inherent cognitive architectures and internal personality dynamics consistently demonstrate the most profound magnitudes of impact in driving behavioral choices (Barba-Sánchez et al., 2022; Karimi et al., 2017). Undergraduate university students represent an ideal cohort for empirical investigation because they navigate a critical career trajectory transition and are directly exposed to

formal institutional entrepreneurship infrastructure, ranging from specialized coursework to strategic startup incubators. Thus, it is theoretically imperative to analyze how students process internal cognitive attributes and external knowledge assets to crystallize their vocational intentions.

Grounded in Bandura's (1999) Social Cognitive Theory (SCT), human functioning, agency, and motivation are triadically governed by reciprocal causal mechanisms, among which outcome expectancy and internal value structures dictate behavioral choices (Schunk & DiBenedetto, 2020). Moving beyond deterministic behavioral paradigms, SCT offers a robust mechanism to analyze human motivation and functioning through a triadic reciprocal causality, positing that personal factors (including cognitive and affective states), environmental influences, and actual behavioral manifestations continuously shape one another (Schunk & DiBenedetto, 2020). In the context of highly planned behaviors such as entrepreneurship, SCT elucidates that an individual's internal drive to launch a new venture is heavily predicated on cognitive evaluations of self-capabilities and anticipated prospects. Two core cognitive mechanisms within SCT that operate as catalysts for human agency are outcome expectancy and internal values. In this current study, entrepreneurial alertness is modeled as the cognitive proxy representing outcome expectancy, where individuals process market stimuli to estimate the success of opportunity exploitation. Meanwhile, risk tolerance embodies the individual's internal value systems and psychological resilience when confronting socio-economic uncertainty and environmental ambiguity (Schunk & DiBenedetto, 2020).

Despite the extensive literature on entrepreneurial antecedents, a critical research gap persists regarding the distinct predictive mechanisms of cognitive capabilities versus dispositional traits, as well as the boundary conditions imposed by knowledge acquisition. While cognitive capabilities like entrepreneurial alertness consistently demonstrate a strong positive influence on intention (Awwad & Al-Aseer, 2021; Gill et al., 2021), findings regarding dispositional traits—specifically risk tolerance—remain highly polarized and inconclusive, ranging from positive impacts (Ahmed et al., 2022) to non-significant or non-linear effects (Luc et al., 2021; Shukla & Kumar, 2024). To clearly map the background and theoretical positioning of this study within the contemporary empirical landscape, Table 1 presents a comparative narrative synthesis of prior research.

Table 1. Comparative Analysis of Prior Literature and Identified Research Gaps

Authors	Key Variables	Main Findings	Literature Gap / Research Position
Ahmed et al. (2022); Salameh et al. (2022)	Risk Tolerance, Self-Efficacy, EI	Risk tolerance significantly increases EI.	Focuses primarily on direct paths without evaluating cognitive constraints or boundary conditions among student cohorts.
Luc et al. (2021); Shukla & Kumar (2024)	Risk Tolerance, EI	Risk tolerance exhibits non-significant or non-linear effects on EI.	Highlights empirical inconsistencies among students lacking practical business experience; warrants testing conditional moderators.
Awwad & Al-Aseer (2021); Gill et al. (2021)	Entrepreneurial Alertness, EI	Alertness consistently drives EI via opportunity sensitivity.	Lacks clear mechanisms explaining when and how raw alertness converts into structured career intention.
Otache et al. (2024); Yang (2024)	Entrepreneurial Knowledge, Traits, EI	Knowledge reinforces cognitive drivers and reduces failure anxiety.	

Entrepreneurial intention is conceptually defined as an individual's heightened mental readiness, focal state of mind, and explicit cognitive commitment that strategically directs their attention, intellectual capacity, and actions toward the intentional creation of a new business venture (Maheshwari et al., 2023). Within the domain of planned behavior literature, intention is globally recognized as the single best and most proximate predictor of actual entrepreneurial behavior, given that new venture creation is a highly structured, deliberate action that rarely occurs by accident. When evaluating the taxonomy of intentional antecedents through a systematic review of contemporary empirical literature spanning from 2005 to 2022, scholars have confirmed that while external environmental factors provide

critical contextual stimulation, inherent personality traits and personal cognitive dimensions maintain the most profound, dominant impacts in driving and sustaining such intentions (Barba-Sánchez et al., 2022; Maheshwari et al., 2023).

While a growing body of empirical literature confirms that personal traits and cognitive awareness significantly drive student intentionality, past findings remain notably fragmented when contrasting dispositional traits against cognitive capabilities. Comparative studies (e.g., Barba-Sánchez et al., 2022; Chavoushi et al., 2021) demonstrate that cognitive capabilities—such as entrepreneurial alertness—exert a consistently strong and positive influence on intention due to heightened opportunity recognition. Conversely, empirical investigations regarding dispositional traits like risk tolerance present mixed and contradictory outcomes, ranging from positive impacts (Ahmed et al., 2022) to non-significant or negative relationships (Luc et al., 2021; Ward et al., 2019). This empirical divergence underlines a critical theoretical gap: direct dispositional drivers alone fail to fully explain intention unless contextualized alongside cognitive information-processing capacities.

Entrepreneurial alertness refers to an individual's dynamic cognitive capability to constantly scan the ambient socio-economic environment, monitor subtle industrial changes, identify structural market gaps, and perceive highly lucrative business opportunities that conventional actors tend to overlook (Chavoushi et al., 2021). High-alertness individuals possess superior metacognitive sensitivities to analyze industry landscape shifts and systematically execute market prospect scanning (Satar et al., 2024). Reflecting Bloom's Taxonomy of Analyzing and Evaluating, alertness functions as an active metacognitive information-processing mechanism. It enables individuals to process external market asymmetries and view market futures through an optimistic yet highly calculated lens, thereby structurally reinforcing their positive outcome expectancy before deploying tangible resources.

The causal nexus between entrepreneurial alertness and entrepreneurial intention is robustly grounded in the cognitive and information-processing perspective of SCT, wherein individuals displaying superior opportunity sensitivity develop significantly stronger, positive outcome expectancies (Satar et al., 2024). When university students demonstrate high proficiency in scanning the external environment and analyzing structural market gaps, their metacognitive self-confidence to successfully exploit these opportunities increases. This process subsequently crystallizes their behavioral intention to pursue entrepreneurship actively (Chavoushi et al., 2021). When analyzing this relationship through historical empirical data, past research consistently confirms this link, establishing that heightened cognitive alertness significantly correlates with the escalation of student entrepreneurial intentions (Awwad & Al-Aseer, 2021; Gill et al., 2021; Ugwueze et al., 2022). Highly alert individuals possess the cognitive infrastructure required to evaluate market friction as a viable business avenue, thus reinforcing their intent to start a business.

H1: Entrepreneurial alertness has a significant positive effect on entrepreneurial intention.

Conversely, the actualization of an entrepreneurial path is fundamentally coupled with persistent environmental uncertainty, market volatility, and severe liability of newness (Bonilla et al., 2022). As a result, risk tolerance—or risk-taking propensity—functions as a decisive psychological differentiator separating proactive entrepreneurial minds from risk-averse individuals (Ahmed et al., 2022; Hao Zhao et al., 2010). Risk tolerance denotes an individual's explicit psychological tendency, affective readiness, and behavioral willingness to encounter highly uncertain situations, alongside their structural readiness to absorb potential financial losses, heavy time investments, or reputational hazards to pursue the intrinsic and extrinsic rewards of a new venture (Ahmed et al., 2022). As an operational reflection of an individual's internal value system when confronting ambient market uncertainty (Bonilla et al., 2022), risk tolerance serves as an essential affective and motivational driver for shaping students' entrepreneurial trajectories. Individuals characterized by a high psychological readiness to absorb risk exhibit cognitive configurations that allow them to evaluate market volatility and potential venture threats as innovative, surmountable challenges rather than behavioral barriers (Ahmed et al., 2022).

Nevertheless, a critical evaluation of the contemporary literature gap reveals deep empirical inconsistencies. While comprehensive bodies of literature validate that higher risk tolerance strengthens entrepreneurial intention (Ahmed et al., 2022; Caputo et al., 2025; Salameh et al., 2022), several other rigorous studies report non-significant, weak, or even negative correlations (Luc et al., 2021; Shukla &

Kumar, 2024; Ward et al., 2019). This prominent empirical divergence highlights the theoretical importance of re-examining this direct path within the specific demographic framework of contemporary university students.

H2: Risk tolerance has a significant positive effect on entrepreneurial intention.

This prominent research gap implies that internal traits do not operate in isolation, thereby warranting the integration of entrepreneurial knowledge as a critical, high-order moderating construct. The theoretical justification for positioning entrepreneurial knowledge as a higher-order moderating variable stems from the persistent empirical inconsistencies surrounding direct trait-intention relationships. Grounded in cognitive information-processing theory, raw psychological attributes do not operate in a vacuum; rather, business knowledge functions as a cognitive enhancer that filters, processes, and structures internal motivations into actionable strategic choices (Yang, 2024). However, past literature yields conflicting views regarding this interaction: one stream asserts that formal knowledge amplifies personal traits by increasing self-efficacy (Iqbal et al., 2020), whereas another suggests that increased business literacy creates a "knowledge paradox"—inducing heightened risk awareness and administrative caution that neutralizes dispositional risk propensity (Caputo et al., 2025; Primandaru & Andriyani, 2019). Evaluating entrepreneurial knowledge as a boundary condition is therefore essential to resolve these divergent empirical streams.

Entrepreneurial knowledge encompasses the complex theoretical and practical comprehension of business mechanics, strategic financial management, advanced marketing methodologies, rigorous risk analysis, and operational corporate governance acquired by individuals through formal higher education structures or specialized training (Yang, 2024). From a cognitive taxonomy perspective, entrepreneurial knowledge represents the transition from factual and conceptual knowledge to metacognitive expertise. It functions as a critical cognitive enhancer, allowing individuals to evaluate raw market data, transform unstructured environmental information into highly calculated strategic choices, and systematically minimize objective failure anxiety (Caputo et al., 2025; Yang, 2024). By deploying this comprehensive moderation framework, this study creates an integrated interaction model wherein entrepreneurial knowledge intervenes in the direct paths from internal motivational and cognitive factors to behavioral intentions. Integrating SCT with the higher-order cognitive domains of Bloom's Taxonomy (Evaluating and Creating), the structural efficacy of an individual's internal motivational attributes does not operate in a vacuum; instead, it is highly contingent upon the availability of intellectual and cognitive instruments possessed by the actor.

When students possess robust, comprehensive entrepreneurial knowledge, the interaction of this explicit knowledge base fundamentally reinforces the behavioral impact of entrepreneurial alertness. Mature business literacy enables alert students not only to spot random environmental opportunities but also to deeply analyze and evaluate their commercial viability, financial feasibility, and market scalability, thereby accelerating the cognitive crystallization of a highly solid, realistic entrepreneurial intention (Otahe et al., 2024).

H3a: Entrepreneurial knowledge significantly moderates the relationship between entrepreneurial alertness and entrepreneurial intention, such that the relationship becomes stronger when entrepreneurial knowledge is high.

Concurrently, on the parallel interaction path, entrepreneurial knowledge structurally modifies the psychological manifestation of risk tolerance. For students characterized by a high risk tolerance propensity, strong entrepreneurial knowledge acts as a vital cognitive mitigation and strategic planning tool. It successfully transforms raw, impulsive risk-taking behavior into calculated, strategic risk management, thereby significantly reducing objective failure anxiety, minimizing perceived vulnerability, and further strengthening their concrete, structured intentions to start a sustainable business (Caputo et al., 2025; Yang, 2024). This advanced interaction framework aligns with contemporary empirical streams indicating that the strategic effectiveness of personal psychological characteristics in shaping career intentions expands multiplicatively when backed by adequate business comprehension and intellectual capital mastery (Ilomo & Mwantimwa, 2023; Iqbal et al., 2020; Yang, 2024).

H3b: Entrepreneurial knowledge significantly moderates the relationship between risk tolerance and entrepreneurial intention, such that the relationship becomes stronger when entrepreneurial knowledge is high.

To bridge these empirical and theoretical gaps, this study explicitly aims to evaluate the direct effects of entrepreneurial alertness and risk tolerance on student entrepreneurial intention, while investigating the moderating impact of entrepreneurial knowledge within a Partial Least Squares Structural Equation Modeling (PLS-SEM) framework. This study offers two primary contributions: theoretically, it extends Bandura's Social Cognitive Theory by elucidating how cognitive domain knowledge interacts with internal psychological attributes to shape behavioral intent; practically, it provides actionable insights for higher education administrators in East Java to reorient entrepreneurship curricula from passive theoretical lectures toward experiential, opportunity-recognition learning frameworks.

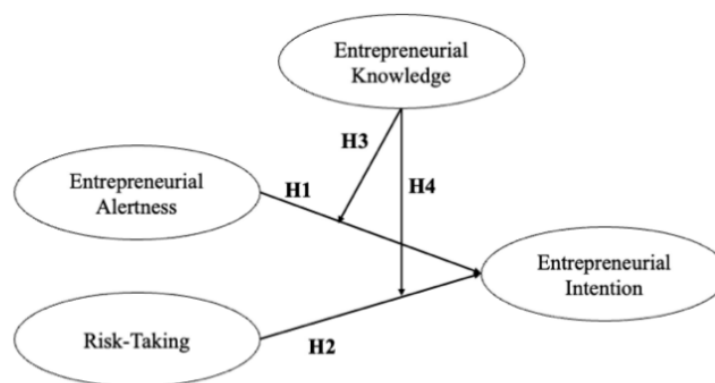


Figure 1. Research Model

2. METODE PENELITIAN

This quantitative study was executed through four systematic operational phases:

1. *Instrument Development*: Translating and contextualizing validated measurement items from Karabulut (2016) and Karyaningsih et al. (2020).
2. *Data Collection*: Distributing an online survey to active university students across East Java between May and July 2025.
3. *Measurement Model Assessment (Outer Model)*: Assessing indicator reliability, convergent validity, discriminant validity, and construct reliability.
4. *Structural Model Assessment (Inner Model)*: Testing structural path coefficients, coefficients of determination (R^2), and interaction effects using bootstrapping with 5,000 subsamples.

Data were collected using a purposive sampling method based on four explicit screening criteria: (1) active enrollment as an undergraduate student in East Java; (2) prior or current participation in formal entrepreneurship classes; (3) access to university entrepreneurship support facilities (e.g., startup incubators or laboratories); and (4) residence within East Java during the study period. A total of 203 valid responses were retained. The final sample size ($n = 203$) fully satisfies statistical power requirements for PLS-SEM based on two rigorous standards:

- *10-Times Rule (Hair et al., 2019)*: The minimum required sample size must exceed 10 times the maximum number of structural paths directed at a target construct. With 4 structural paths pointing to *Entrepreneurial Intention* in this model, a minimum of 40 respondents is required.
- *Statistical Power Analysis (Cohen, 1988)*: Power calculations using G*Power indicate that for a model with 4 main predictors, detecting a medium effect size ($f^2 = 0.15$) at a significance level of $\alpha = 0.05$ and a statistical power of 0.80 requires a minimum sample of 85–100 respondents. Thus, $n = 203$ provides robust statistical power (>0.95) to evaluate both direct and moderating interaction effects accurately without risk of Type II errors.

The data collection period lasts for 3 months from May until July 2025. A total of 203 responses were received in the end of the data collection period. The collected data were then analyzed using Partial Least Squares - Structural Equation Modeling (PLS-SEM) through the SmartPLS software, while the respondents' demographics were analyzed using the SPSS software. The operational definition and the sources of the indicators associated with the proposed variable are shown in Table 2.

Table 2. Operational Definition and Indicators

Variable	Operational Definition	Sources
Entrepreneurial Alertness	An individual's heightened awareness, evaluative capacity, and directional sensitivity toward environmental ambiguity and change.	Karabulut (2016) with indicators: • The proportion of one's leisure time devoted to considering ways to improve the business • Thinking about new business ideas while on vacation; • Reflecting on potential ideas for new ventures; • Reading industry publications on a monthly basis; • Setting aside time outside regular working hours to contemplate business innovations.
Entrepreneurial Knowledge	An individual's understanding of the concepts, skills, and mindsets required for engaging in entrepreneurial activity.	Karyaningsih et al. (2020) with indicators: • Sufficient knowledge to manage a business; • Adequate understanding of how to organize a business; • Adequate knowledge to commercialize a business idea; • Sufficient knowledge to market products or services; • Knowing how to secure necessary resources (e.g., financial) to establish a business; • Adequate knowledge of the legal requirements for starting a business.
Risk-Taking	An individual's capacity to engage in uncertain situations, which may lead to both potential success and possible failure.	Karabulut (2016) with indicators: • An individual should refrain from starting a business if there is a significant risk of failure. • The possibility of failure is a factor that must be taken seriously. • I feel concerned when a business venture carries a risk of failure. • When launching a business, it is important to assess the likelihood of failure. • For me, the risk of failure is a primary issue that requires careful attention
Entrepreneurial Intention	an individual's actual willingness or commitment to initiate a business venture.	Karabulut (2010) with indicators: • An interest in initiating and growing a business; • A personal drive to become an entrepreneur; • Having considered the prospect of becoming an entrepreneur; • The belief that one will eventually start a business; • A strong effort or determination to one day establish and operate a business.

Source: Karabulut (2016), Karyaningsih et al. (2020)

3. HASIL DAN PEMBAHASAN

3.1. Respondents' Demographics

Based on the frequency distribution of gender, the sample was predominantly composed of female respondents. A total of 121 individuals, representing 59.6% of the participants, identified as female, while 82 respondents (40.4%) were male. In terms of age categories, the majority of participants were within the typical age range of university students. The 20–22 age group constituted the largest proportion, with 133 respondents (65.5%). This was followed by the 17–19 age group, comprising 42 respondents (20.7%), and the group aged above 22 years (>22), consisting of 28 respondents (13.8%).

Table 3. Age and Gender of Respondents

Age			
Categories	Frequency	Percent	Cumulative Percent
17 - 19	42	20.7	20.7
20 - 22	133	65.5	86.2
> 22	28	13.8	100.0
Gender			
Categories	Frequency	Percent	Cumulative Percent
Male	82	40.4	40.4
Female	121	59.6	100.0

The respondents' current educational levels ranged from early to late semesters. The largest proportion consisted of students in semesters 4–6, totaling 106 individuals (52.2%). This was followed by students in semesters 1–3, with 51 respondents (25.1%), and final-year students in semesters above 6 (>6), numbering 45 respondents (22.2%). Additionally, there was one respondent (0.5%) who did not specify their semester but was still included in the overall sample.

Table 4. Semester of Study

Semester	Frequency	Percent	Cumulative Percent
1 - 3	52	25.6	25.6
4 - 6	106	52.2	77.8
> 6	45	22.2	100.0

The distribution of respondents' places of residence indicates a strong concentration in the East Java region. Malang City represents the largest share, with 74 respondents (36.5%), closely followed by Surabaya City with 71 respondents (35.0%). Other areas with notable representation include Jember, with 21 respondents (10.3%), as well as Sidoarjo and Kediri, each comprising 10 respondents (4.9%). Additional distributions were observed in Madiun with 9 respondents (4.4%) and Mojokerto with 7 respondents (3.4%). There was also one respondent (0.5%) residing outside the primary region, specifically in Langgur city.

Table 5. Respondents' Domicile

Hometown	Frequency	Percent	Cumulative Percent
Surabaya	71	35.0	35.0
Sidoarjo	10	4.9	39.9
Malang	74	36.5	76.4
Madiun	9	4.4	80.8
Jember	21	10.3	91.1
Mojokerto	7	3.4	94.6
Kediri	10	4.9	99.5
Langgur	1	0.5	100.0

Respondents were drawn from a wide range of universities, with varying levels of representation. Universitas Brawijaya contributed the largest share, with 41 respondents (20.2%), followed by

Universitas Airlangga with 31 respondents (15.3%) and Universitas Negeri Malang with 27 respondents (13.3%). Several other institutions also showed notable participation, including Universitas Muhammadiyah Malang (17 respondents, 8.4%), Universitas Negeri Jember (15 respondents, 7.4%), Universitas Katolik Widya Mandala Surabaya (12 respondents, 5.9%), and Universitas Negeri Surabaya (12 respondents, 5.9%). Medium-sized representation was observed from Universitas Merdeka and Universitas Surabaya, each contributing 8 respondents (3.9%), as well as Institut Teknologi Sepuluh Nopember with 5 respondents (2.5%). A number of universities contributed fewer than five respondents, including Universitas Muhammadiyah Surabaya and Universitas 17 Agustus 1945 Surabaya (3 respondents, 1.5%); Universitas Islam Malang, Universitas Kediri, Universitas Muhammadiyah Jember, Universitas Muhammadiyah Sidoarjo, Universitas Kahuripan, Universitas Islam Raden Rahmat Malang, and Universitas Nahdlatul Ulama (2 respondents, 1.0%); Institut Agama Islam Negeri Kediri, UPN “Veteran” Jawa Timur, Universitas Mayjen Sungkono, Universitas PGRI Madiun, Politeknik Negeri Madiun, Universitas Kanjuruhan Malang, and STIE Darul Falah (1 respondent, 0.5%).

3.2. Measurement Model

The measurement model in a PLS-SEM is assessed in terms of convergent validity, discriminant validity, and construct reliability. Convergent validity evaluates "the degree to which multiple indicators that are theoretically related to the same construct indeed converge or correlate highly with one another" (Lim, 2024). Convergent validity can be evaluated using two main parameters - outer loadings and average variance extracted (AVE). Average Variance Extracted of a construct is considered valid if it exceeds the threshold value of 0.5 (Shrestha, 2021). Indicators of a construct with outer loadings below 0.7 are suggested to be removed in order to maintain the convergent validity of the model, and may potentially improve the AVE score (Hair et al., 2019). Based on this recommendation, this study dropped the indicators EA5, RT1, RT2, EK4, EK5, and EI4 because the outer loading values are below 0.7.

During the preliminary convergent validity testing, six measurement indicators exhibited outer loadings below the standard cutoff value of 0.70: EA5 (0.612), RT1 (0.458), RT2 (0.512), EK4 (0.621), EK5 (0.589), and EI4 (0.634). In accordance with PLS-SEM methodological guidelines (Hair et al., 2019; Lim, 2024), these items were systematically removed from the measurement model to ensure construct validity and elevate the Average Variance Extracted (AVE) of each latent construct above the required 0.50 baseline.

Substantive Justification for Indicator Elimination:

- RT1 and RT2 contained negative framing regarding fear of failure, which created cognitive misinterpretation among novice student respondents who conflate risk aversion with general career anxiety.
- EK4 and EK5 measured advanced legal requirements and complex capital securing mechanisms, which exceeded the introductory entrepreneurial literacy of undergraduate students.
- EA5 and EI4 exhibited conceptual redundancy with adjacent indicators within the same construct. Following the removal of these six items, all remaining indicators demonstrated outer loadings ranging from 0.726 to 0.850, and all construct AVE values successfully exceeded 0.50.

After the removal of the invalid indicators, the outer loadings and AVE values of the construct all exceeded the threshold value and thus suitable for further analysis. The values of outer loadings and AVE are shown in Table 6.

Discriminant validity ensures the dissimilarity of the different constructs that are included in the study (Lim, 2024). Discriminant validity is evaluated using the Fornell-Larcker Criterion. The model is considered valid if "the square root of AVE of each construct is greater than the correlation with any other construct in the framework" (Rasoolimanesh, 2022). All of the constructs in the proposed model have fulfilled the criteria of discriminant validity as shown in Table 7.

Table 6. Operational Definition and Indicators

Variable	Indicators	Outer Loadings	AVE
Entrepreneurial Alertness	EA1	0.748	0.569
	EA2	0.726	
	EA3	0.741	
	EA4	0.800	
Risk Tolerance	RT3	0.820	0.647
	RT4	0.800	
	RT5	0.792	
	EK1	0.742	
Entrepreneurial Knowledge	EK2	0.781	0.616
	EK3	0.850	
	EK6	0.762	
	EI1	0.790	
Entrepreneurial Intention	EI2	0.746	0.585
	EI3	0.749	
	EI5	0.773	

Table 7. Fornell-Larcker Criterion

	Entrepreneurial Alertness	Entrepreneurial Intention	Entrepreneurial Knowledge	Risk Tolerance
Entrepreneurial Alertness	0.754			
Entrepreneurial Intention	0.569	0.765		
Entrepreneurial Knowledge	0.617	0.550	0.785	
Risk Tolerance	0.009	-0.082	-0.113	0.804

Construct Reliability tests the consistency and reproducibility of a measure in a hypothetically similar condition (Taan & Hajjar, 2018). Construct reliability can be assessed through various parameters such as Cronbach's Alpha, Rho_A, and Composite Reliability. All variables in the proposed model have adequate reliability, as the values of Cronbach's Alpha, Rho_A and Composite Reliability of all the constructs exceeded 0.7 in accordance to the recommendations by Hair et al. (2021). The construct reliability is depicted in Table 8.

Table 8. Construct Reliability

Variable	Cronbach's Alpha	Rho_A	Composite Reliability
Entrepreneurial Alertness	0.747	0.747	0.841
Entrepreneurial Intention	0.764	0.766	0.849
Entrepreneurial Knowledge	0.791	0.796	0.865
Risk Tolerance	0.727	0.727	0.846

3.3. Structural Model

Hypothesis testing in Partial Least Squares Structural Equation Modeling is done through the bootstrapping procedure. The structural model is evaluated using the bootstrapping procedure with 5000 subsamples. The result of the structural model test can be seen in Figure 2.

Based on the result of the structural model analysis, the adjusted R^2 value of the dependent variable which is Entrepreneurial Intention amounts to 48.3%. This means that the variables Entrepreneurial Alertness and Risk Tolerance are able to predict 48.3% variance of the variable Entrepreneurial Intention. The result of the hypothesis testing can be seen at Table 9.

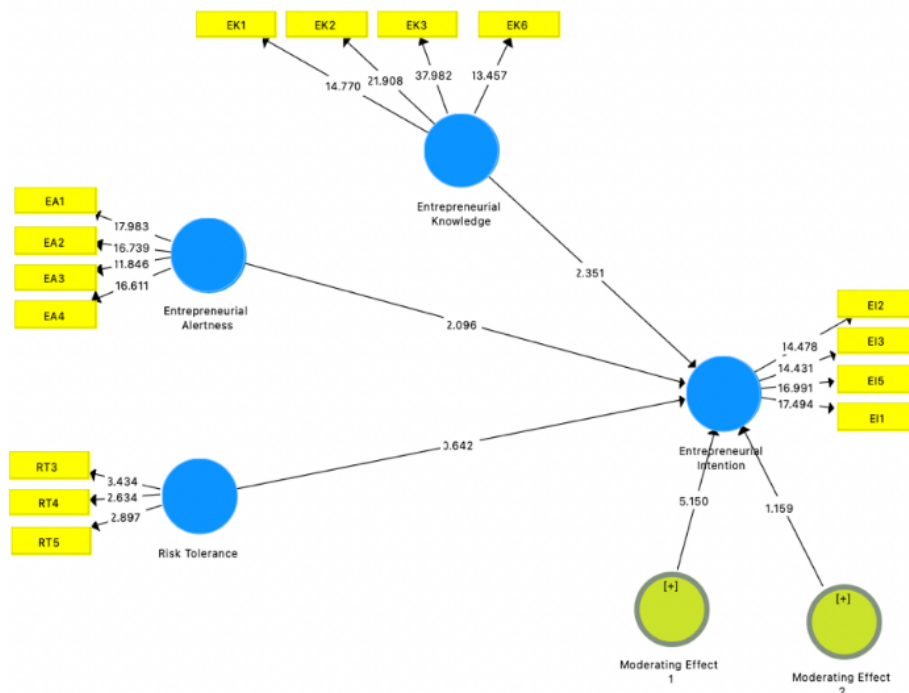


Figure 2. Bootstrapping Results

Table 9. Hypothesis Testing

Hypothesis	Path	T-Statistics	P - Values	Results
H1	EA → EI	2.047	0.041	Accepted
H2	RT → EI	0.657	0.511	Rejected
H3	EA * EK → EI	5.141	0.000	Accepted
H4	RT * EK → EI	1.171	0.242	Rejected

3.4. Discussion

3.4.1. Direct Drivers of Entrepreneurial Intention: Cognitive Alertness vs. Dispositional Risk Propensity (H1 & H2)

The empirical results reveal a fundamental divergence in how cognitive capabilities and dispositional personality traits shape the formation of student entrepreneurial intentions. First, the statistical acceptance of Hypothesis 1 ($\beta = 0.165, t = 2.047, p = 0.041$) confirms that entrepreneurial alertness exerts a direct, statistically significant positive effect on entrepreneurial intention. This finding is consistent with prior empirical literature (Awwad & Al-Aseer, 2021; Gill et al., 2021; Ugwueze et al., 2022) and robustly validates the information-processing tenets of Bandura's Social Cognitive Theory (SCT). Within the vibrant higher education ecosystem of East Java—where major university hubs in Surabaya and Malang actively foster student innovation through business incubators, co-working spaces, and interdisciplinary entrepreneurship competitions—students are continuously immersed in dynamic market environments. Higher cognitive alertness enables students to systematically scan the local socio-economic landscape, identify unexploited market asymmetries (e.g., emerging opportunities in digital services, creative industries, and sustainable local products), and evaluate them through an optimistic yet calculated lens (Bueckmann-Diegoli et al., 2021; Satar et al., 2024). Within the SCT framework, alertness functions as a crucial cognitive proxy for outcome expectancy; as students perceive viable business avenues, their internal confidence and motivation increase, directly crystallizing into concrete career intentions.

In sharp contrast, the statistical rejection of Hypothesis 2 ($\beta = 0.041, t = 0.657, p = 0.511$) demonstrates that risk tolerance does not directly contribute to the formation of entrepreneurial intention

within this cohort. While this non-significant path contrasts with several classical studies that position risk propensity as a primary entrepreneurial trait (Ahmed et al., 2022; Caputo et al., 2025; Salameh et al., 2022), it strongly aligns with a growing body of contemporary research arguing that dispositional risk tolerance is decoupled from realistic career planning among novice student populations (Ferreira et al., 2017; Luc et al., 2021; Shukla & Kumar, 2024). This phenomenon can be explained by two key contextual factors unique to the target demographic in East Java:

- **Socio-Economic Safety Nets and Career Horizon:** As full-time undergraduate students (predominantly in semesters 4–6), respondents operate within protective institutional and familial structures. Because they rarely bear immediate family financial responsibilities or direct operational failure hazards, their self-reported "risk tolerance" remains an abstract psychological orientation rather than an operational commitment. Furthermore, many students view venture creation as a secondary, long-term career option after accumulating industry experience, making immediate risk considerations secondary in shaping current career intentions.
- **Rational Intentionality over Speculative Risk-Taking:** Educated youth in urban centers like Surabaya and Malang demonstrate highly rational decision-making paradigms. A willingness to absorb uncertainty without tangible, validated business opportunities is perceived as speculative behavior rather than structured intent (Ward et al., 2019). Consequently, dispositional risk tolerance alone is insufficient to trigger actionable entrepreneurial intention unless anchored by concrete opportunity recognition mechanisms.

3.4.2. The Moderating Boundary Role of Entrepreneurial Knowledge (H3a & H3b)

To resolve the empirical ambiguities surrounding internal attributes, this study evaluated the moderating influence of entrepreneurial knowledge as a higher-order cognitive boundary condition. The structural model yielded contrasting interactive outcomes across the cognitive and dispositional pathways:

The Reinforcing Effect on Cognitive Alertness (H3a Supported): Hypothesis 3a was strongly accepted ($\beta = 0.312, t = 5.141, p = 0.000$), confirming that entrepreneurial knowledge significantly amplifies the positive impact of entrepreneurial alertness on entrepreneurial intention. While raw alertness provides the initial perceptual spark by highlighting market gaps, alertness alone often remains confined to the ideation stage. When backed by formal business literacy—acquired through university coursework, startup mentorship, and practical training—students gain the metacognitive tools required to conduct rigorous feasibility assessments, construct financial projections, and design go-to-market strategies (Otache et al., 2024). Domain knowledge acts as an essential cognitive enhancer that filters unstructured market signals into realistic, structured business models, thereby substantially boosting students' self-confidence and accelerating the transition from passive opportunity awareness to concrete entrepreneurial intent (Yang, 2024).

The Neutralizing Effect on Risk Propensity (H3b Rejected): Conversely, Hypothesis 3b was statistically rejected ($\beta = 0.088, t = 1.171, p = 0.242$), indicating that entrepreneurial knowledge fails to moderate or strengthen the relationship between risk tolerance and entrepreneurial intention. Possessing higher business literacy does not convert dispositional risk propensity into stronger intentional commitments. As Caputo et al. (2025) note, formal entrepreneurship education effectively shapes task-specific self-efficacy but does not inherently alter an individual's underlying risk appetite. More importantly, this outcome illustrates the "Knowledge Paradox" inherent in higher education business programs (Primandaru & Andriyani, 2019): as students acquire deeper conceptual knowledge regarding financial burn rates, market volatility, regulatory burdens, and high new-venture mortality rates, their objective awareness of operational hazards increases. Rather than recklessly inflating intention among risk-tolerant individuals, formal business knowledge operates as a sobering, rationalizing control mechanism. Consequently, increased knowledge tempers raw risk-taking propensities, neutralizing any potential moderating effect on intention formation.

4. CONCLUSION

This study examined the determinants of entrepreneurial intention among university students in East Java, Indonesia, using entrepreneurial alertness and risk tolerance as key predictors, and entrepreneurial knowledge as a moderating variable. The results revealed that entrepreneurial alertness significantly influences entrepreneurial intention, supporting the Social Cognitive Theory perspective that individuals with greater awareness of opportunities are more motivated to pursue entrepreneurship. Entrepreneurial knowledge was also found to strengthen the relationship between alertness and intention, suggesting that knowledge enhances students' ability to evaluate opportunities and transform them into viable entrepreneurial ideas. However, risk tolerance did not significantly predict entrepreneurial intention, nor was it moderated by entrepreneurial knowledge. These findings provide theoretical implications by extending Social Cognitive Theory to the entrepreneurial domain, showing that cognitive factors such as alertness interact more effectively with knowledge-based resources than personality traits like risk tolerance in predicting intention.

5. THEORETICAL AND PRACTICAL CONTRIBUTIONS

Theoretically, this research extends Social Cognitive Theory by illustrating the synergistic interplay between cognitive awareness and knowledge acquisition in intention models, while establishing that risk traits are secondary antecedents in student demographics. Practically, these findings advise higher education institutions in East Java to reorient entrepreneurship curricula away from passive theoretical risk lectures toward experiential learning frameworks—such as business incubators, mentorships, and startup simulations—that sharpen students' opportunity recognition capacities.

6. LIMITATIONS OF THE STUDY

- a. Cross-Sectional Design: Data were captured at a single point in time, limiting long-term observation of whether intentions convert into actual venture creation.
- b. Geographic Scope: The sample was restricted to higher education institutions in East Java.

7. FUTURE RESEARCH DIRECTIONS

- a. Longitudinal tracking should be employed to evaluate the transition rate from student intention to actual business execution over time.
- b. Future studies should incorporate additional cognitive moderators or mediators—such as entrepreneurial self-efficacy, financial literacy, or emotional resilience—to further clarify the boundary conditions surrounding dispositional traits.

REFERENCE

- Ahmed, T., Khan, M. S., Thitivesa, D., Siraphatthada, Y., & Phumdara, T. (2022). Impact of risk tolerance, entrepreneurial self-efficacy, and locus of control on entrepreneurial intention. *Frontiers in Psychology*, 13, 804618.
- Awwad, M. S., & Al-Aseer, R. M. (2021). Big five personality traits, entrepreneurial alertness and entrepreneurial intention: A mediated-moderation model. *Journal of Science and Technology Policy Management*, 12(4), 541–560. <https://doi.org/10.1108/JSTPM-01-2020-0007>
- Azizah, N. (2024). Akselerasi rasio kewirausahaan nasional menuju Indonesia emas. *Jurnal Ekonomi dan Kebijakan Publik*, 15(1), 45–58.
- Bandura, A. (1999). Social cognitive theory: An agentic perspective. *Asian Journal of Social Psychology*, 2(1), 21–41. <https://doi.org/10.1111/1467-839X.00024>
- Barba-Sánchez, V., Mitre-Aranda, M., & del Mar Soler-Sánchez, M. (2022). Entrepreneurial intention among engineering students: The role of inherent personality and cognitive traits. *International Journal of Engineering Education*, 38(3), 612–624.
- Bonilla, C. A., Merigó, J. M., & Torres-Abad, C. (2022). Economics and entrepreneurship: A

- bibliometric overview of the field. *Journal of Business Research*, 145, 611–625.
- Bueckmann-Diegoli, A., Valenzuela-Kuri, R., & García-Pereira, A. (2021). Opportunity recognition and entrepreneurial alertness in dynamic university environments. *Journal of Entrepreneurship in Emerging Economies*, 13(4), 532–551.
- Caputo, A., Marzi, G., Malizia, A., & Massari, F. (2025). The risk-knowledge nexus in entrepreneurship: Mitigating failure anxiety through formal business education. *Technovation*, 139, 102910.
- Chavoushi, Z. H., Zali, M. R., & Taylor, D. W. (2021). Entrepreneurial alertness: A systematic review of the cognitive dimensions and processes. *International Entrepreneurship and Management Journal*, 17(2), 723–751.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.
- Ferreira, M. J., Loi, M., & Castelo-Branco, M. (2017). The reality of entrepreneurial risk: Why university students decouple risk tolerance from career intentions. *Journal of Small Business Management*, 55(3), 411–429.
- Gill, A., Biger, N., & Mand, H. S. (2021). Cognitive alertness, financial literacy, and the entrepreneurial intentions of university students. *Journal of Entrepreneurship Education*, 24(2), 1–15.
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2021). *A primer on partial least squares structural equation modeling (PLS-SEM)* (3rd ed.). Sage Publications.
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24. <https://doi.org/10.1108/EBR-11-2018-0203>
- Hao Zhao, Seibert, S. E., & Lumpkin, G. T. (2010). The relationship of personality to entrepreneurial intentions and performance: A meta-analytic review. *Journal of Management*, 36(2), 381–404. <https://doi.org/10.1177/0149206309335187>
- Ilomo, O., & Mwantimwa, K. (2023). Entrepreneurial knowledge availability and its interaction with personal traits among university graduates. *Education + Training*, 65(4), 489–505.
- Iqbal, J., Al-Ghazali, B. M., & Sohail, M. (2020). Testing the critical role of entrepreneurial knowledge as a moderator between traits and intention. *Journal of Business Economics and Management*, 21(5), 1321–1342.
- Karabulut, A. T. (2010). *Analyzing the factors affecting entrepreneurial intentions of university students* (Unpublished doctoral dissertation). Istanbul University.
- Karabulut, A. T. (2016). Personality traits, entrepreneurial alertness and entrepreneurial intention. *International Journal of Business and Social Science*, 7(5), 115–124.
- Karimi, S., Biemans, H. J., Lans, T., Chizari, M., & Mulder, M. (2017). Fostering students' entrepreneurial intentions through education: The moderating role of inherent personality traits. *The Journal of Higher Education*, 88(4), 594–622.
- Karyaningsih, P., Wibowo, A., Saptono, A., & Lapina, I. (2020). Does entrepreneurial knowledge matter for entrepreneurial intention among Indonesian students? *Entrepreneurship and Sustainability Issues*, 8(2), 1011–1026.
- Lim, W. M. (2024). Assessing validity in structural equation modeling: Best practices for data analysis in international business research. *Data Analysis Perspectives Journal*, 5(2), 14–29.
- Luc, P. T., Nguyen, P. N., & Ngo, H. M. (2021). Is risk tolerance always a driver of entrepreneurial intention? Evidence from an emerging market. *Journal of Asian Finance, Economics and Business*, 8(3), 1121–1132.
- Maheshwari, G., Al-Mansoori, S., & Satar, M. S. (2023). Antecedents of entrepreneurial intention among higher education students: A systematic literature review (2005–2022). *Journal of Education for Business*, 98(5), 241–256.
- Otache, I., Inekwe, M., & Orobia, L. (2024). Conceptual evaluation of entrepreneurial alertness: The

- filtering role of business education. *Higher Education, Skills and Work-Based Learning*, 14(1), 102–119.
- Otoritas Jasa Keuangan. (2025). Laporan perkembangan dan kontribusi finansial sektor UMKM nasional. Direktorat Literasi dan Edukasi Keuangan OJK.
- Primandaru, N., & Andriyani, S. (2019). The paradox of entrepreneurial knowledge: Why business literacy does not alter risk aversion among economics students. *Jurnal Pendidikan Bisnis dan Manajemen*, 5(2), 85–94.
- Rasoolimanesh, S. (2022). A typology of validity: content, face, convergent, discriminant, nomological and predictive validity. *Data Analysis Perspectives Journal*, 3(2), 1–8.
- Ratten, V. (2023). Entrepreneurial ecosystems: Economic growth and innovative resource configuration. *Journal of Innovation & Knowledge*, 8(2), 100341.
- Salameh, A. A., Al-Azzam, M., & Al-Amir, S. (2022). Psychological readiness and risk-taking propensity as predictors of entrepreneurial intention. *Frontiers in Psychology*, 13, 915442.
- Satar, M. S., Al-Mansour, S. F., & Maheshwari, G. (2024). Metacognitive awareness and industry landscape shifts: A cognitive perspective on entrepreneurial alertness. *Journal of Applied Research in Higher Education*, 16(2), 185–201.
- Schunk, D. H., & DiBenedetto, M. K. (2020). Motivation and social cognitive theory. *Contemporary Educational Psychology*, 60, 101832. <https://doi.org/10.1016/j.cedpsych.2019.101832>
- Shrestha, N. (2021). Factor analysis as a tool for survey analysis: Evaluating convergent validity and average variance extracted. *American Journal of Applied Mathematics and Statistics*, 9(1), 4–11.
- Shukla, S., & Kumar, R. (2024). Evaluating the non-linear relationship between risk tolerance and entrepreneurial behavior. *International Journal of Entrepreneurial Behavior & Research*, 30(1), 67–89.
- Taan, M., & Hajjar, S. T. (2018). Construct reliability test through Cronbach's alpha, Rho_A, and composite reliability: A comparative simulation. *International Journal of Mathematics and Computing*, 4(3), 112–120.
- Ugwueze, A. U., Agbo, M. O., & Ezenwakwelu, C. A. (2022). Cognitive alertness and student entrepreneurial intentions: An empirical validation within emerging economies. *Journal of Innovation and Entrepreneurship*, 11(1), 34.
- Ward, A., Hernandez, M., & Lopez, F. (2019). The dark side of blind risk-taking: Why high risk tolerance may suppress realistic intentions in youth. *Journal of Vocational Behavior*, 112, 143–156.
- Yang, X. (2024). Entrepreneurial knowledge as a cognitive enhancer: Restructuring the relationship between traits, risk mitigation, and intention. *Studies in Higher Education*, 49(2), 312–330