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Strengthening Students' Entrepreneurial Intentions through the Entrepreneurial Ecosystem: Supporting the Sustainable Development Goal on Quality Education

Nurlaila[1*], Arina Salsabilla Haq[2]
[1]Universitas Negeri Surabaya, Surabaya, Indonesia
[2]Louis Leitz Schule, Stuttgart, Deutschland Germany

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ABSTRACT

Objective: *This study aims to examine how key components of the entrepreneurial ecosystem, including access to funding, government programs and support, physical infrastructure, and entrepreneurship education, influence students' entrepreneurial intentions. The research aligns with the Sustainable Development Goals (SDGs), particularly SDG 4.4, which focuses on enhancing skills for employment, decent work, and entrepreneurship among youth.* ***Method:*** *A quantitative approach was employed in this research. The subjects of this research are undergraduate students from the 2021 and 2022 cohorts of the Economics Education Study Program, Faculty of Economics and Business, State University of Surabaya, with a sample of 125 students selected through simple random sampling. Data were collected using a questionnaire and analyzed using Structural Equation Modeling (SEM) with the help of WarpPLS software.* ***Results:*** *The results demonstrate that all four ecosystem components have a significant and positive effect on entrepreneurial intention, with entrepreneurship education and training exerting the strongest influence. These findings validate the Theory of Planned Behavior (TPB) by linking ecosystem factors with key psychological determinants such as attitudes, subjective norms, and perceived behavioral control.* ***Novelty:*** *The novelty of this research lies in its contextual focus on pre-service economics teachers as future agents of entrepreneurial education and in its contribution to SDG oriented entrepreneurship policy and curriculum development in higher education.*

INTRODUCTION

Entrepreneurship has become a major focus in Indonesia due to its critical role in driving economic growth (Andriyati et al., 2023; Nursanti et al., 2024). Over recent years, attention to entrepreneurship has intensified, driven by awareness of its importance in creating employment and increasing welfare (Endris & Kassegn, 2022; Opute et al., 2021). Despite these efforts, Indonesia's entrepreneurial activity remains relatively low, with only 3.35% of the workforce engaged in entrepreneurship, compared to 4.74% in Malaysia, 8.76% in Singapore, and 12% in the United States (Purwantono, 2024). This challenge is closely aligned with the broader agenda of the Sustainable Development Goals (SDGs), a global framework comprising 17 goals and 169 targets that address interconnected themes of economic growth, social development, and environmental protection (UN, 2015), where entrepreneurship is seen as a key driver to advance inclusive economic opportunities and sustainable prosperity. Entrepreneurship serves as a key driver in promoting global sustainable

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development by fostering innovation, job creation, and economic resilience. In particular, it contributes directly to the achievement of the United Nations Sustainable Development Goals (SDGs), notably SDG 4: Quality Education. In SDG 4.4 specifically emphasizes equipping youth with relevant skills, including technical and vocational education, for employment and entrepreneurship (Edokpolor, 2020). SDG 4.4 is a sub-target of SDG 4 that aims to substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs, and entrepreneurship. It highlights the need to enhance education systems so they can produce not only academically competent graduates but also individuals prepared for the demands of the labor market and capable of creating employment through entrepreneurial ventures (Martín-Gutiérrez et al., 2024).

To address this gap, the Indonesian government has implemented strategic programs targeting youth, such as the Indonesian Student Entrepreneurship Program (PKMI). These efforts align with SDG 4.4, which emphasizes equipping youth with skills for employment and entrepreneurship. Nevertheless, students still face systemic challenges such as limited funding access, insufficient entrepreneurial training, and inadequate infrastructure (Arianto & Masnawati, 2024).

Entrepreneurial intention is a pivotal factor in nurturing entrepreneurial ecosystems, as recognized by Ajzen's Theory of Planned Behavior (TPB). According to TPB, entrepreneurial intention is influenced by attitudes, subjective norms, and perceived behavioral control (Ajzen, 1991). These factors are deeply connected to ecosystem components such as funding access, government support, physical infrastructure, and entrepreneurship education (Lu et al., 2021).

Access to funding affects perceived behavioral control, as financial support reduces perceived risk and enhances self-efficacy (Azis et al., 2023; Indarto & Santoso, 2020). Government programs and support influence subjective norms, creating a social climate that encourages entrepreneurship (Hisyam et al., 2024; Wang & Zhang, 2024). Physical infrastructure (transport, digital networks) reinforces perceived behavioral control by enabling efficient operations and access to markets (Kaggwa et al., 2024; Venâncio et al., 2023). Entrepreneurship education and training shape attitudes by increasing awareness, skills, and motivation to become entrepreneurs (Aboobaker & D., 2020; Al-Tekreeti et al., 2024).

Chaudhary et al. (2024), Rabelo Neto et al. (2024) and Rocha et al. (2024) emphasize that the entrepreneurial ecosystem is a collaborative structure involving government, universities, investors, and communities. This interconnection ensures the availability of capital, mentoring, and operational resources that influence entrepreneurial decisions.

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While prior research has addressed these components, Economics Education students remain an underrepresented group. These students, as future educators, play a dual role in promoting economic literacy and entrepreneurial values. This study focuses on Economics Education students at Universitas Negeri Surabaya (UNESA), aligning with East Java's regional efforts to boost youth entrepreneurship and Indonesia's commitment to achieving SDG 4.4: Quality Education for Entrepreneurship.

This research offers several key contributions. For students, it provides insights into the factors that influence entrepreneurial intention, encouraging them to actively develop and pursue business ideas. For academics, the study contributes to both theoretical and empirical understandings of how the entrepreneurial ecosystem affects students' entrepreneurial intentions, particularly among those in the Economics Education Program. For government and policymakers, the findings serve as scientific evidence to guide the formulation of more effective entrepreneurship-support policies for higher education students. For entrepreneurs and industry players, this research serves as a reference for developing incubation programs and collaborative initiatives with universities to promote youth entrepreneurship. This study contributes to the literature and policy by examining how entrepreneurial ecosystems shape student intention, thereby supporting broader SDG 4.4 objectives.

Based on these contributions, the study seeks to answer the following research questions: (1) How does access to funding influence the entrepreneurial intention of students (2) How do government programs and support affect the entrepreneurial intention of these students? (3) How does access to physical infrastructure impact their entrepreneurial intention? (4) How does entrepreneurship education and training shape their entrepreneurial intention?

Accordingly, the research aims to: (1) Analyze the influence of funding access on students' entrepreneurial intention, (2) Examine the effect of government programs and support, (3) Investigate the role of physical infrastructure access, and (4) Assess the impact of entrepreneurship education and training on the entrepreneurial intention of students in the Economics Education Program at UNESA.

The entrepreneurial ecosystem encompasses institutional and contextual factors that collectively support or hinder entrepreneurship. It includes access to capital, educational programs, infrastructure, and policy support (Chaudhary et al., 2024). hese elements are critical in shaping the environment in which entrepreneurial intentions are formed, particularly within educational settings.

Sustainable Development Goal 4.4 targets the enhancement of technical and vocational skills to support youth employability and entrepreneurship. According to Ajzen's Theory of Planned Behavior (TPB), entrepreneurial intention is influenced by

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attitudes, subjective norms, and perceived behavioral control. These psychological components are shaped by the surrounding ecosystem. Access to funding boosts perceived behavioral control by minimizing risk and increasing confidence (Azis et al., 2023. Government programs influence subjective norms by legitimizing entrepreneurship as a viable career path (Hisyam et al., 2024). Infrastructure, particularly digital and communication resources, supports the feasibility of business operations (Venâncio et al., 2023). Most importantly, entrepreneurship education cultivates positive attitudes by providing students with knowledge, motivation, and self-efficacy (Aboobaker & D., 2020).

Despite the growing literature, the integration of ecosystemic and psychological frameworks within the SDG context remains limited, especially among future educators. This study bridges that gap by focusing on students in teacher training programs, providing insight into how educational environments contribute to sustainable economic development.

RESEARCH METHOD

Materials and Methods

This study employs a quantitative approach with the aim of analyzing the influence of factors within the entrepreneurial ecosystem on students' entrepreneurial intention. The research is associative in nature, meaning it investigates the relationships and effects between defined exogenous and endogenous variables.

The study was conducted among students of the Economics Education Study Program from the 2021 and 2022 cohorts at Universitas Negeri Surabaya, with a total population of 183 students. The sample was selected randomly using a simple random sampling technique, resulting in a final sample of 125 students (73 from the 2021 cohort and 52 from the 2022 cohort). According to Hair et al. (2014), a minimum sample size of 100 is considered acceptable for SEM-PLS analysis involving 4-5 constructs, which confirms that the sample size in this study ensures sufficient statistical power and robustness of results. Data collection was carried out through an online questionnaire distributed via digital platforms. The research took place from April to May 2025.

Measurement Instruments

The questionnaire used in this study was divided into two parts: measurement of the entrepreneurial ecosystem (exogenous variables) and measurement of entrepreneurial intention (endogenous variable).

The entrepreneurial intention (IB) scale was adapted from Liñán & Chen (2009) and consists of six items measured on a 5-point likert scale (1 = strongly disagree, 5 =

strongly agree). The adaptation process included forward and backward translation, linguistic adjustments, and expert judgment to ensure contextual relevance and content validity for Indonesian university students.

Items measuring the entrepreneurial ecosystem were developed based on the Global Entrepreneurship Monitor (GEM, 2019), focusing on four key dimensions: access to funding (AP), government programs and support (PDP), access to physical infrastructure (AIF), and entrepreneurship education and training (PPK). These items were also validated through expert review to ensure alignment with the local academic and institutional context.

Validity and Reliability

Before structural analysis, the instrument was tested for convergent validity, composite reliability, and internal consistency. The results demonstrated that all constructs achieved Average Variance Extracted (AVE) values above the recommended threshold of 0.50 (Hair et al., 2011), indicating that the indicators sufficiently explained the variance of their respective latent constructs. Additionally, all variables recorded Composite Reliability (CR) values above 0.70, reflecting a high level of internal consistency. Furthermore, Cronbach's Alpha coefficients for all constructs exceeded 0.70, confirming that the measurement instruments used in this study were both reliable and valid for further analysis.

Data Analysis

The collected data were analyzed using Structural Equation Modeling based on Partial Least Squares (SEM-PLS) to test the proposed model of variable relationships, utilizing WarpPLS 7.0 software. This method allows for simultaneous analysis of complex models involving latent variables and is appropriate for studies with relatively small to medium sample sizes. The analysis includes evaluation of the measurement model (outer model) and structural model (inner model), including path coefficients, significance values, and R-squared scores.

In Structural Equation Modeling (SEM), the variables analyzed are latent variables, whose measurements are indirectly obtained through a series of observable indicators (F. Hair Jr et al., 2014). PLS-SEM analysis involves three stages, beginning with model specification, which defines two components: the structural (inner) model that illustrates causal relationships between constructs, and the measurement (outer) model that links indicators to their constructs, either reflectively or formatively. The process starts by designing a path model grounded in theory, classifying constructs as exogenous (independent, e.g., X1–X4) or endogenous (dependent, e.g., Y), as shown in Figure 1.

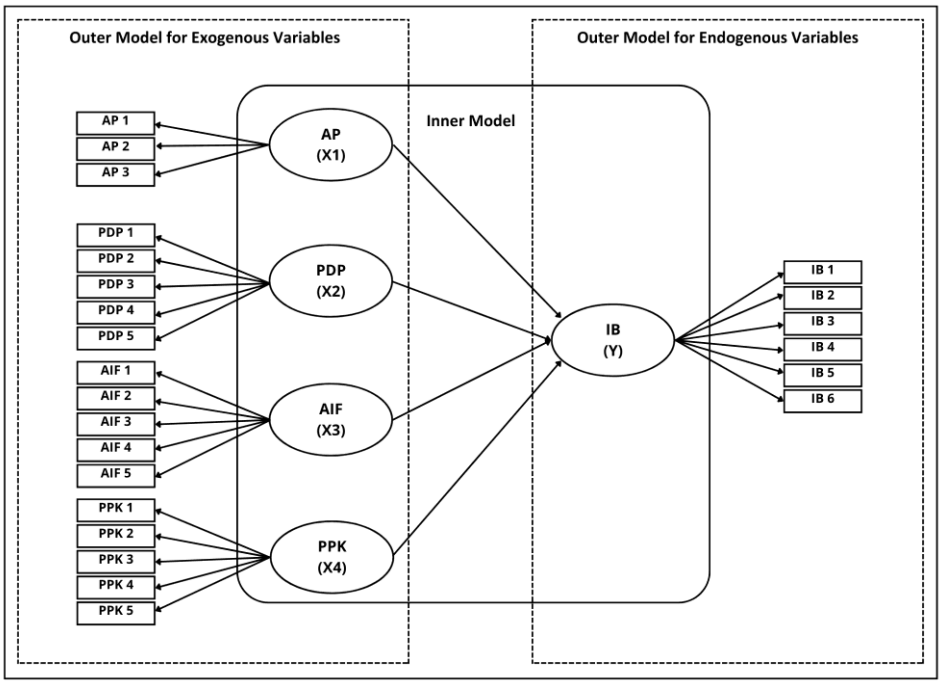

Figure 1. Model specification.

The outer model, also known as the measurement model, explains the relationship between latent variables and their observed indicators. Latent variables are abstract concepts that cannot be measured directly, so they are represented through indicators such as survey items. The outer model can be either reflective, where the indicators reflect changes in the latent construct, or formative, where the indicators collectively form the construct. Evaluation of the outer model involves testing convergent validity, discriminant validity, and reliability using measures like factor loadings, composite reliability, and Cronbach's alpha.

On the other hand, the inner model, or structural model, describes the relationships between the latent variables themselves. It shows how one construct influences or predicts another, for example, how access to funding might impact entrepreneurial intention. The inner model is assessed by examining path coefficients, which indicate the strength and direction of relationships, as well as R^2 values to determine how much variance in the dependent variable is explained.

RESULTS AND DISCUSSION

Results

Factor loadings

Table 1. Factor loading

Indicators	Loading factor	Indicators	Loading factor
AP1	0.810	AIF5	0.750

Indicators	Loading factor	Indicators	Loading factor
AP2	0.754	PPK1	0.689
AP3	0.823	PPK2	0.763
PDP1	0.666	PPK3	0.765
PDP2	0.750	PPK4	0.755
PDP3	0.779	PPK5	0.722
PDP4	0.664	IB1	0.848
PDP5	0.662	IB2	0.789
AIF1	0.793	IB3	0.859
AIF2	0.767	IB4	0.858
AIF3	0.792	IB5	0.880
AIF4	0.655	IB6	0.846

The table above shows that all indicators for each variable meet the criteria for convergent validity, with loading factor values above 0.60, indicating that each indicator significantly represents the construct being measured. For the variable Access to Funding (AP), the lowest loading value is found in indicator AP1 (0.754), and the highest in AP3 (0.823). The variable Government Programs and Support (PDP) has the lowest loading value in PDP5 (0.662) and the highest in PDP3 (0.779). For the variable Access to Physical Infrastructure (AIF), the lowest loading is in AIF4 (0.655) and the highest in AIF1 (0.793). The variable Entrepreneurship Education and Training (PPK) shows the lowest loading in PPK1 (0.689) and the highest in PPK3 (0.765). Meanwhile, in the variable Entrepreneurial Intention (IB), indicator IB1 has the lowest loading value (0.789), and IB5 has the highest (0.880). Therefore, all indicators in the five research variables have met the standard for convergent validity and are considered valid for further analysis.

Table 2. AVE

Variable	Average Variance Extracted (AVE)
AP	0.796
PDP	0.706
AIF	0.753
PPK	0.739
IB	0.847

After conducting the loading factor test to measure the contribution of each indicator to its construct, the next step is to perform the Average Variance Extracted (AVE) test. According to Hair et al. (2011), a construct is considered to have good convergent validity if its AVE value exceeds 0.60.

Composite Reliability

Table 3. Composite Reliability

Variable	Composite Reliability
AP	0.839
PDP	0.832
AIF	0.867
PPK	0.858
IB	0.938

The results of the composite reliability test show that all variables have coefficient values greater than 0.60, thus meeting the established reliability criteria. This indicates that each variable demonstrates a good level of measurement consistency and can be trusted to represent the constructs measured in this study.

Cronbach's Alpha

Table 4. Cronbach's Alpha

Variable	Cronbach's Alpha
AP	0.711
PDP	0.746
AIF	0.808
PPK	0.792
IB	0.921

Based on the results of the Cronbach's alpha test shown in the table above, all variables in this study exceed the minimum required threshold of 0.60. This indicates that each construct has adequate internal consistency in measuring the intended concept. The Cronbach's Alpha values that meet the reliability threshold confirm that all constructs in this study have satisfied both validity and reliability criteria.

Coefficient of Determination (R^2)

Table 5. Coefficient of Determination (R^2)

	AP	PDP	AIF	PPK	IB
R-Squared					0.576

The R-Squared (R^2) test result shows a value of 0.576 or 57.6%, which indicates that the variable Entrepreneurial Intention (IB) can be explained by the variables Access to Funding (AP), Government Programs and Support (PDP), Access to Physical Infrastructure (AIF), and Entrepreneurship Education and Training (PPK). The

remaining 42.4% is influenced by other variables outside the model. According to the criteria by Hair et al. (2014), an R^2 value of 0.576 falls into the moderate category, suggesting that the model has a reasonably good predictive ability.

Hypothesis Testing

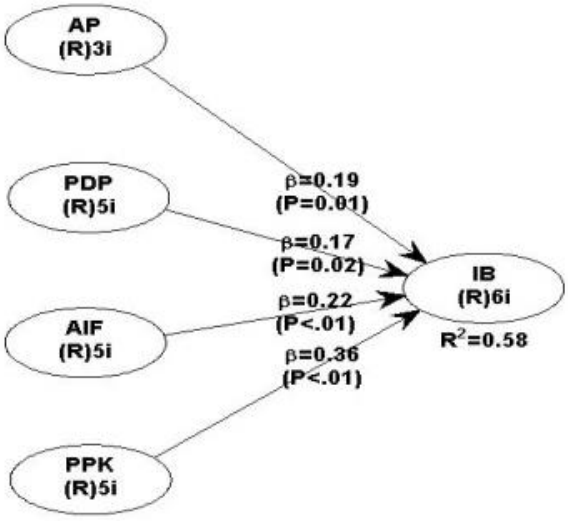

Figure 2. Hypothesis Testing

Table 6. Path Coefficients

Relationship Between Variables (Exogenous → Endogenous Variable)		path coefficients	p-value	Description
AP	IB	0.188	0.015	Accepted
PDP	IB	0.171	0.024	Accepted
AIF	IB	0.217	0.006	Accepted
PPK	IB	0.356	<0.001	Accepted

The variable of funding access was found to have a significant effect on entrepreneurial intention, aligning with the established hypothesis. Based on the analysis using WarpPLS 7.0, the path coefficient was 0.188 with a p-value of 0.015, which is below the 0.05 significance threshold. This indicates that the influence of funding access on entrepreneurial intention is statistically significant. Furthermore, the positive path coefficient suggests that improved access to funding contributes positively to the enhancement of students' entrepreneurial intentions. Therefore, the first hypothesis (H1) is accepted.

Similarly, government programs and support also demonstrated a significant impact on entrepreneurial intention, as hypothesized. The path coefficient was 0.171 with a p-value of 0.024, which is below the 0.05 threshold, indicating statistical significance. The positive coefficient implies that increased government support and programs correlate

with stronger entrepreneurial intentions among students. Hence, the second hypothesis (H2) is supported.

The hypothesis regarding the influence of access to physical infrastructure on entrepreneurial intention is also supported by the analysis results, with a path coefficient of 0.217 and a p-value of 0.006, indicating a statistically significant relationship. The positive coefficient confirms that better access to physical infrastructure enhances students' entrepreneurial intention. Therefore, the third hypothesis (H3) is accepted.

Lastly, entrepreneurship education and training were found to significantly influence entrepreneurial intention, with a path coefficient of 0.356 and a p-value of less than 0.001, well below the significance level of 0.05. This result confirms that entrepreneurship education and training have a strong positive impact on students' entrepreneurial intention. Accordingly, the fourth hypothesis (H4) is accepted.

Discussion

The Influence of Access to Funding on Entrepreneurial Intention

Access to funding was found to have a significant and positive influence on students' entrepreneurial intention ($\beta = 0.188$, $p = 0.015$), supporting Hypothesis 1 (H1). This confirms that better access to financial resources increases students' perceived control over their ability to initiate business ventures, in line with the Theory of Planned Behavior (TPB). In particular, AP3 (family funding) had the highest factor loading, emphasizing the crucial role of family support in lowering psychological and financial barriers. As SDG 4.4 highlights the importance of preparing youth with relevant entrepreneurship skills, access to funding can empower students by reducing barriers and building their confidence to apply those skills in real-world contexts. This suggests that family support plays a significant role in encouraging students to engage in entrepreneurship. Financial support from family not only facilitates access to start-up capital but also provides a psychological safety net that supports risk-taking in entrepreneurial ventures. These results are in line with previous studies (Arshad & Berndt, 2023; Cardella et al., 2020) which emphasize the importance of instrumental social support. However, overreliance on familial funding may reduce self-reliance, emphasizing the need for inclusive financial instruments such as micro-loans, grants, and student-friendly venture capital (Saoula et al., 2023), highlighting the need for balance between support and autonomy. This implies a need for entrepreneurship education to not only promote resource access but also cultivate independence and resilience, thereby balancing support with autonomy.

The Influence of Government Programs and Support on Entrepreneurial Intention

Government support also significantly influenced entrepreneurial intention ($\beta = 0.171$, $p = 0.024$), thus validating Hypothesis 2 (H2). The perception that government

assistance, such as subsidies, incentives, and entrepreneurial training, is available appears to reinforce subjective norms within TPB, encouraging students to pursue entrepreneurial paths. These findings reinforce the value of institutional frameworks that promote youth participation in enterprise development. Under SDG 4.4, which promotes quality education aimed at employability and entrepreneurship, government programs such as subsidies, tax reliefs, and training initiatives help translate theoretical learning into viable career pathways. However, the effect size was modest compared to other variables. This finding suggests that students particularly value and benefit from direct governmental assistance, such as business start-up subsidies, tax incentives, and easier access to financing. Such support reduces financial burdens and risk, enabling students to initiate entrepreneurial ventures with greater confidence. These findings align with research by Mawardi et al. (2025) also Shao and Wang (2023), which highlight the importance of government support in fostering entrepreneurial intention. This could reflect practical limitations, such as bureaucratic inefficiencies or limited awareness and access among students, as highlighted by Mxunyelwa & Vallabh (2025) and Seda & Ismail (2020). Although the intention behind such policies is positive, their effectiveness in influencing student behavior depends heavily on accessibility, clarity, and delivery mechanisms.

The Influence of Physical Infrastructure Access on Entrepreneurial Intention

Access to infrastructure had a significant impact on entrepreneurial intention ($\beta = 0.217$, $p = 0.006$), validating Hypothesis 3 (H3). AIF1 (communication facilities) was the strongest indicator, highlighting the importance of telecommunications infrastructure such as internet connectivity in improving students' perceived behavioral control. Within the framework of SDG 4.4, ensuring equitable access to digital tools and platforms is essential for fostering inclusive education that supports entrepreneurship. Students emphasized the importance of stable internet, digital tools, and co-working spaces in supporting entrepreneurial ventures. When students have reliable access to infrastructure, they can better manage operations, reach markets, and innovate. Effective communication enables students to expand networks, access market information, and interact efficiently with customers and business partners. These findings are consistent with studies by Gomes and Lopes (2022) and Bergantino et al. (2023), who link quality infrastructure to entrepreneurial performance. However, inequitable infrastructure development and unreliable connectivity can pose major barriers, especially in under-resourced areas (Singun, 2025). These disparities reduce students' perceived behavioral control and may limit their ability to engage in entrepreneurial activities, even when motivated.

The Influence of Entrepreneurship Education and Training on Entrepreneurial Intention

Entrepreneurship education and training had the strongest effect on entrepreneurial intention ($\beta = 0.356$, $p < 0.001$), supporting Hypothesis 4 (H4). This confirms the TPB proposition that attitudes toward behavior are shaped by knowledge and experience. This finding underscores the critical role of experiential learning and competency-building in supporting SDG 4.4 (Ferguson & Roofe, 2020). Participation in entrepreneurship labs and training enhanced students' confidence and skills, demonstrating the transformative potential of inclusive and skills-based education. UNESA's active initiatives, such as PKMI, entrepreneurship labs, and mentoring, likely enhance students' belief in their entrepreneurial capabilities. PPK3 (participation in training) was the most influential indicator, reflecting the value of experiential learning. Experiential learning provides hands-on exposure that helps students understand real-world business challenges. It enhances their confidence and decision-making abilities, preparing them to face business risks. Prior research supports this assertion, emphasizing the value of experiential learning over theoretical instruction alone (Singh et al., 2024; Sofiullah et al., 2023). Moreover, informal and non-graded activities, such as workshops and mentoring sessions, may exert even greater influence than formal classroom-based modules (Overwien et al., 2024).

CONCLUSION

Fundamental Finding: This study confirms the significant impact of entrepreneurial ecosystem components, namely access to funding, government support, physical infrastructure, and entrepreneurship education on students' entrepreneurial intentions. Among these, entrepreneurship education and training had the strongest influence, underscoring the vital role of experiential learning in shaping positive entrepreneurial attitudes. These findings directly contribute to the realization of SDG 4.4: Quality Education for Entrepreneurship, especially for pre-service teachers in higher education institutions. These findings also reinforce the empirical validity of the Theory of Planned Behavior (TPB), wherein access to education influences attitudes, government support shapes subjective norms, and access to funding and infrastructure enhances perceived behavioral control. Thus, this research contributes both to practical strategies in entrepreneurship development and to the theoretical enrichment of TPB within the context of higher education. **Implication:** To strengthen entrepreneurial outcomes, the State University of Surabaya must enhance the effectiveness of its facilities, embed practical soft skills training, and broaden funding access. The government should intensify program outreach, ensure equitable access, especially in underserved areas and provide sustained mentoring. Strengthened and sustained collaboration between the university and government is essential to maximize the long-term impact of entrepreneurship initiatives on students. **Limitation:** This study is limited to cross-sectional data from a single university and a specific student population (Economics

Education at UNESA). As such, the results may not be generalizable to other contexts or disciplines. Future research should explore longitudinal designs and include diverse student groups and institutional settings to capture broader trends in entrepreneurship education and its alignment with SDG 4.4. **Future Research:** To better support the realization of the SDGs through higher education and entrepreneurship, future research should expand to include students from various academic disciplines and institutions to enhance generalizability and contextual relevance. In line with SDG 4, particularly Target 4.4, employing a mixed-methods approach, integrating qualitative insights, can provide a deeper understanding of students' entrepreneurial skills, motivations, and contexts. Incorporating additional theoretical frameworks that consider external factors such as economic conditions, cultural influences, and the entrepreneurial ecosystem can further support efforts to enhance relevant skills for decent work and entrepreneurship. Longitudinal studies are also encouraged to examine how evolving external conditions impact students' entrepreneurial intentions and preparedness over time, contributing to the development of inclusive and future-ready education systems.

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*__Nurlaila (Corresponding Author)__
Afilliation: Universitas Negeri Surabaya
Address: Jl. Ketintang, Kampus 1 Unesa, Gayungan, Surabaya, East Java
Email: nurlaila.21032@mhs.unesa.ac.id

Arina Salsabilla Haq
Afilliation: Louis Leitz Schule
Address: Weiner Str. 51, 700469, Stuttgart, Deutschland Germany
Email: arina.haq@gmx.de