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The development of entrepreneurship education in Indonesia: A systematic literature review of studies (2016-2025)

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ABSTRACT

This study aims to review the development of research on entrepreneurship education in Indonesia over the last decade 2016–2025 through a Systematic Literature Review (SLR) approach with the PRISMA framework. Data were obtained from international and national publication bases (ScienceDirect, Google Scholar, PublishorPerish, and ERIC) with a total of 67 articles meeting the inclusion criteria. The results of the study show an increasing trend, albeit not constant, in the number of publications, a shift in the focus of variables from best practices to psychological, social, and pedagogical aspects, and a dominance of undergraduate student participants. Quantitative survey-based research methods are the most widely used, while research at the primary and non-formal education levels is still limited. In terms of the topical issues, previous studies are more concerned with curriculum and learning materials development, the impact and outcome of entrepreneurship education, cultural adaptation and contextualization during the implementation of entrepreneurship education, and the challenges encountered by the stakeholders. These findings emphasize the need for technology integration, cultural adaptation, and longitudinal studies to strengthen the effectiveness of entrepreneurship education in Indonesia.

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1. INTRODUCTION

Entrepreneurship is not merely an individual business activity, but rather a fundamental instrument in structural transformation and a key driver of national economic growth (Doran et al., 2018). Such transformation is associated with innovation as a development accelerator, triggering a shift from traditional to modern sectors (Gamede & Uleanya, 2018; Uleanya, 2020). From a broader macroeconomic perspective, Anokhin et al. (2011) asserted that entrepreneurship is a primary vehicle for development and it is regarded as a crucial engine of economic growth (Khamimah, 2021; Naudé, 2010). Furthermore, entrepreneurship serves as a strategic mechanism for realizing the three core values of development as defined by Todaro and Smith (2015): sustenance, self-esteem, and freedom. Therefore, to create an entrepreneurial ecosystem capable of empowering the national economy, efforts are needed to instill a strong entrepreneurial spirit through education.

Internalizing an entrepreneurial spirit, encompassing creativity, innovation, risk-taking, and leadership, requires a holistic approach through an integrative educational ecosystem. Nuraeni (2022) emphasizes that entrepreneurial values, including independence, action-orientedness, and hard work, must be explicitly reflected in the syllabus and Lesson Plan (RPP). However, this transformation should not be trapped in a narrow dichotomy between mastery of theory and field practice. As Nuraeni (2022) viewed, there is a hierarchy of failure risks that must be understood: primary failure of an entrepreneur is often rooted in reliance on experience without an adequate educational foundation, while secondary failure is caused by education lacking field experience. Therefore, the curriculum must synergize the two through school culture and extracurricular activities. This process aims to eliminate negative mental attitudes and increase individual fighting spirit. Furthermore, developing a superior entrepreneurial character is a long-term process involving the development of high-level skills such as self-awareness, empathy, problem-solving, and stress management. The successful internalization of this character is highly dependent on intensive supervision and synergy between the school and parents.

Although the urgency of entrepreneurship education has been widely recognized, there is a significant gap between the ideal and the empirical reality in Indonesia. Statistical data from the Central Statistics Agency (BPS) in 2007, as cited in Nuraeni (2022), shows that the entrepreneur ratio in Indonesia only reached 0.18%, or around 400,000 people. This figure is still far from the minimum threshold of 2%, which is considered a prerequisite for a nation to achieve developed nation status. This phenomenon is exacerbated by the increasing number of educated unemployed, especially at the graduate level, who tend to have a mentality of job seekers rather than job creators. Nuraeni (2022) analyzes that there has been a worrying cultural shift from a formerly self-sufficient society, based on the agricultural and trade sectors, to one dependent on the formal sector. Without a systematic mental transformation through an education system capable of integrating theoretical foundations and practical experience, the Indonesian nation risks becoming trapped in a cycle of economic dependency and continued entrepreneurial failure.

Curriculum reform in higher education is a strategic urgency in responding to bureaucratic rigidity and the disparity in

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human resource quality standards between regions, which underpin the birth of the Indonesian National Qualifications Framework (KKNI) in the era of Industry 4.0 (Lailatussaadah et al., 2020). An effective implementation formula demands synergy between empowering the capacity of teaching faculty, providing adequate infrastructure, and financial support, which, although crucial, often becomes an operational obstacle due to limited funding allocation (Lailatussaadah et al., 2020; Lubis, 2015). This strengthening must be supported by a diversification of practical teaching methods that go beyond conventional theory, including case study analysis, venture plan writing, coaching through coaching, computer simulations, and study visits to industry and screenings of short entrepreneurial films (Pratama, 2010; Wiratno, 2012). All implementation instruments must be placed on the spirit of the Tri Dharma of Higher Education, where the integration of teaching, innovative research, and community service functions as a laboratory of values to form an entrepreneurial ecosystem based on mastery of science and technology (Milla, 2013).

Entrepreneurship education plays a crucial role in advancing student's entrepreneurial knowledge, skills, mindset, and spirits (Endarwati et al., 2023; Farid et al., 2024; Isti et al., 2025; Krishnawati et al., 2023; Minah et al., 2024; Nayak et al., 2024; Siregar et al., 2023). Entrepreneurship education has also been regarded as a useful means for promoting students' interpersonal communication abilities (Rismawan et al., 2023). Such an education becomes an antithesis to the phenomenon of intellectual unemployment, which has reached 6.2% at the undergraduate level and 6.9% at the diploma level (BPS, 2019; Lailatussaadah et al., 2020). The significance of this policy becomes even sharper when faced with the threat of digital system automation, which is predicted that it will displace 52.6 million jobs, as well as a warning of the elimination of 35% of types of jobs in the next five years (Lailatussaadah et al., 2020). However, the potential benefits of developing this entrepreneurial character are often distorted by a profound sociocultural paradox; On the one hand, the state encourages digitalization and economic independence, but on the other hand, the stigma of a career as a civil servant (PNS) continues to dominate public preferences with the number of applicants reaching 31,686 people in 2019. This tension is exacerbated by the mismatch of skills and operational constraints such as the low practical competence of lecturers and the lack of courage of students in carrying out business risk management (Eriawaty & Fitriyanti, 2016; Lubis, 2015).

Despite the growing discourse on entrepreneurship education, current literature still shows empirical inconsistencies regarding its long-term effectiveness and the challenges encountered. Martin et al. (2013) highlighted the lack of consistent evidence regarding the extent to which Entrepreneurship Education and Training (EET) can produce better and more sustainable business outcomes. A review of previous research revealed that the majority of studies tend to focus on administrative narratives and the construction of theoretical model, but lack in-depth analysis of the real operational obstacles faced in the field (Lili, 2011; Milla, 2013; Wei et al., 2025). As a strategic recommendation for policymakers, future research should focus more on measuring long-term impacts and the urgency of establishing minimum service standards in the implementation of entrepreneurship education to achieve optimal goals

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(Wiratno, 2012). Without strict minimum standards, the implementation of entrepreneurship education risks becoming merely an administrative formality without any real impact on strengthening the economic structure and reducing educated unemployment systemically. Regarding the challenges, previous studies have noted several concerns in implementing entrepreneurship education, such as insignificant change on the students' learning outcomes due to lack of teachers' skills, inadequate knowledge of current teaching technology (e.g., Nwekeaku, 2013); no interdisciplinary approaches to make entrepreneurship education accessible for all students with different backgrounds (e.g., Ndedi, 2013); and the need for full support in utilizing digital technology to assist the entrepreneurship education (e.g., Takemoto & Oe, 2021). In other words, the government and educational institutions should emphasize entrepreneurship education as a strategic response to youth unemployment and the need for a competitive workforce (Susilaningsih, 2021).

Although previous studies have extensively investigated the affordance and challenges of entrepreneurship education, a review of research milestone regarding the implementation of entrepreneurship education in the Indonesian context remains limited. Also, what major themes emerge from the previous studies from which insights can be gained remain fragmented in the literature. A systematic literature review is needed to bridge these themes, particularly considering Indonesia's cultural, regional, and socioeconomic diversity. The researchers have identified similar previous reviews (e.g., Adnan et al., 2020; Arifah et al., Elpisah et al., 2024; Kasimba et al., 2024; Lailatussaadah et al., 2020) synthesizing research endeavours regarding the milestone of entrepreneurship education in the Indonesian context or the opportunities and challenges from its implementation Saudi Arabia (e.g., Hameed & Irfan, 2019) and Iran (e.g., Karimi et al., 2010). However, most of the reviews focus on one particular education level; either secondary or higher education. This might not capture more comprehensive and comparative trends across education levels. Additionally, the present study obtained the papers from several databases to ensure that the synthesis of findings adequately portrays the current circumstances. Another similar systematic review conducted by Rauf et al. (2024) only focus on the opportunity to integrate digital transformation into entrepreneurship education in Indonesia. This leaves out an empirical gap of a more holistic portrait of the previous results. This study uses the PRISMA framework to systematically map and analyze the evidence, identify gaps, and provide guidance for future policy and practice. The following questions drive the present study.

1. What are the trends on entrepreneurship education in previous studies in Indonesia over the last decade (2016-2025)?
    a. Number of publications each year
    b. Research variables being analyzed
    c. Research locus and participants
    d. Research methods and data collection techniques
    e. Research keywords being concerned
2. What emerging themes are identified from previous studies on entrepreneurship education in Indonesia?

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2. LITERATURE REVIEW

The role of entrepreneurship in national development

Through its capacity to absorb excess labor and increase purchasing power, entrepreneurship facilitates the transition of societies out of absolute poverty, although Naudé (2009) critically notes that the structural challenge in developing countries often lies not in the limited supply of entrepreneurs, but rather in the constraints on the allocation of unproductive or rent-seeking entrepreneurial activity. In this regard, there is significant differentiation in impact based on national economic context; findings by Doran et al. (2018) indicate that while entrepreneurial attitudes have a positive influence on Gross Domestic Product (GDP) in high-income countries, entrepreneurial activity has been empirically found to have a negative effect on GDP per capita in middle- and low-income countries. Consequently, for Indonesia, the urgency of developing this sector is increasingly apparent given that the national entrepreneurship ratio only reached 2% in October 2019, meaning there is still a gap from the ideal threshold of 2.5% for achieving national prosperity (Khamimah, 2021). Comprehensively, achieving this target requires policy orchestration that focuses on four main pillars of national entrepreneurship development: effective access to capital, escalating the role of innovation, intensifying entrepreneurship training, and an active role for the government in creating a conducive business climate (Doran et al., 2018; Khamimah, 2021).

Entrepreneurship Education in Indonesia

Education is a fundamental prerequisite for developing individual abilities and fostering community life, particularly in efforts to maintain human dignity amidst the dynamics of a developing country like Indonesia (Nuraeni, 2022). In the discourse of national development, the function of formal educational institutions must transform beyond merely being institutions for the transfer of technical knowledge. Education needs to be positioned as a strategic instrument designed to foster independence, in-depth knowledge, and strong motivation to solve employment problems and high unemployment rates. Nuraeni (2022), citing Ciputra's views, projects that the internalization of entrepreneurial values at all levels of education could have a massive national impact if it succeeds in producing at least four million new entrepreneurs within the next 25 years. Theoretically, this argument aligns with Nuraeni (2022), who assert that a country's economic growth is closely correlated with the quantity and quality of entrepreneurs who act as driving forces for innovation and capital accumulation. Realizing this macroeconomic potential is impossible without structured pedagogical interventions to foster an entrepreneurial mentality from an early stage of development.

The development of entrepreneurship education in Indonesia, both in schools and universities, has shown increasingly intensive dynamics over the past decade. At the elementary and secondary school levels, the government, through national programs such as the National Entrepreneurship Movement (GKN) and policy studies at the Center for Research and Development (Puslitjaknov Balitbang), has encouraged the integration of entrepreneurship into the curriculum, although implementation remains limited to activities such as business days, bazaars, and entrepreneurship studies. Meanwhile, in universities, various institutions such as Bandung Institute of Technology (ITB), UPI,

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Maranatha Christian University, and the Telkom Institute of Management have developed an entrepreneurial ecosystem through formal curricula, business incubators, student entrepreneur programs (PMW), and academic-industry-government collaborations. The learning models implemented are not only theory-based but also emphasize real-world practice, mentoring, and technology commercialization. A study by Lubis (2015) confirms that entrepreneurship education in Indonesia has evolved from mere classroom instruction to an integrative model such as the Triple-I Learning Model, which combines innovation, interaction, and incubation to shape a generation of educated entrepreneurs. Thus, despite still facing challenges in the form of limited access, funding, and the digital divide, the direction of development shows a strong commitment to making entrepreneurship a strategic pillar of national economic development.

3. RESEARCH METHODS

3.1 Research design

This study used the Systematic Literature Review (SLR) method to identify, evaluate, and synthesize various research findings related to the development of entrepreneurship education in Indonesia. The SLR method was chosen because it provides a comprehensive, systematic, and structured overview of research trends, learning approaches, and the effectiveness of entrepreneurship education implementation at various levels of education. This approach allows researchers to avoid subjective bias in literature selection because all stages are carried out based on predetermined procedures.

The implementation of SLR in this study refers to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The PRISMA guidelines are used to ensure the process of searching, screening, and selecting articles is carried out transparently and can be replicated by other researchers. The PRISMA stages include article identification, screening, eligibility checks, and determining the final studies. By using PRISMA, this study is expected to have stronger methodological validity and produce a credible literature synthesis.

Furthermore, this research is descriptive-qualitative in nature, focusing on the interpretation of previous research findings. The researchers did not conduct direct experiments, but instead analyzed published research findings to identify patterns, trends, research gaps, and the direction of entrepreneurship education development in Indonesia over a specific period.

3.2 Search Strategy and Data Sources

The literature search strategy was conducted systematically through several reputable scientific databases, namely ScienceDirect, Google Scholar, PublishorPerish, and ERIC. These databases were selected based on their broad publication coverage and relevance to educational research in Indonesia. Scopus and Web of Science were used to obtain reputable international articles, while Google Scholar and Garuda were utilized to reach national publications relevant to the context of entrepreneurship education in Indonesia.

The article search process used specific keyword combinations tailored to the

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research focus. The primary keywords used included "entrepreneurship education" AND "Indonesia," "entrepreneurial learning," "entrepreneurial competence," and Indonesian equivalents such as "entrepreneurship education," "entrepreneurship learning," and "entrepreneurship competence." The use of Boolean operators such as AND and OR aimed to broaden and narrow search results to ensure the articles obtained were more relevant to the research topic.

The publication period used in this study is 2016–2025. This timeframe was chosen to obtain an overview of the latest developments in entrepreneurship education in Indonesia over the past decade. The articles found were then downloaded and documented using a reference management application to facilitate the process of identifying and managing literature data.

3.3 Inclusion and Exclusion Criteria

Inclusion and exclusion criteria were established to ensure the articles analyzed were truly relevant to the research objectives. Articles included in the inclusion criteria were scientific journal articles indexed in designated databases, both national and international. Furthermore, articles must specifically discuss entrepreneurship education in Indonesia, including elementary, secondary, tertiary, and non-formal education. Articles must also be available in full-text format to allow for in-depth analysis of the research content.

Meanwhile, articles that met the exclusion criteria were opinion pieces, editorials, short proceedings, or non-research publications lacking a clear scientific methodology. Articles irrelevant to the educational context, for example, those that only discussed entrepreneurship from a purely business perspective without any connection to learning or education, were also excluded from the analysis process. Furthermore, duplicate articles found in more than one database were eliminated to avoid double-counting of research data.

The inclusion and exclusion criteria were applied in stages throughout the article screening process. This stage is crucial to maintaining the quality of the data sources, ensuring that the literature synthesis provides valid information that aligns with the research focus on the development of entrepreneurship education in Indonesia.

3.4 Selection Process

The study selection process follows the stages outlined in the PRISMA flowchart: identification, screening, eligibility, and inclusion. During the identification stage, all articles obtained from various databases were collected and recorded. Articles with similar titles or detected as duplicates were removed before proceeding to the next stage. Figure 1 depicts the selection process.

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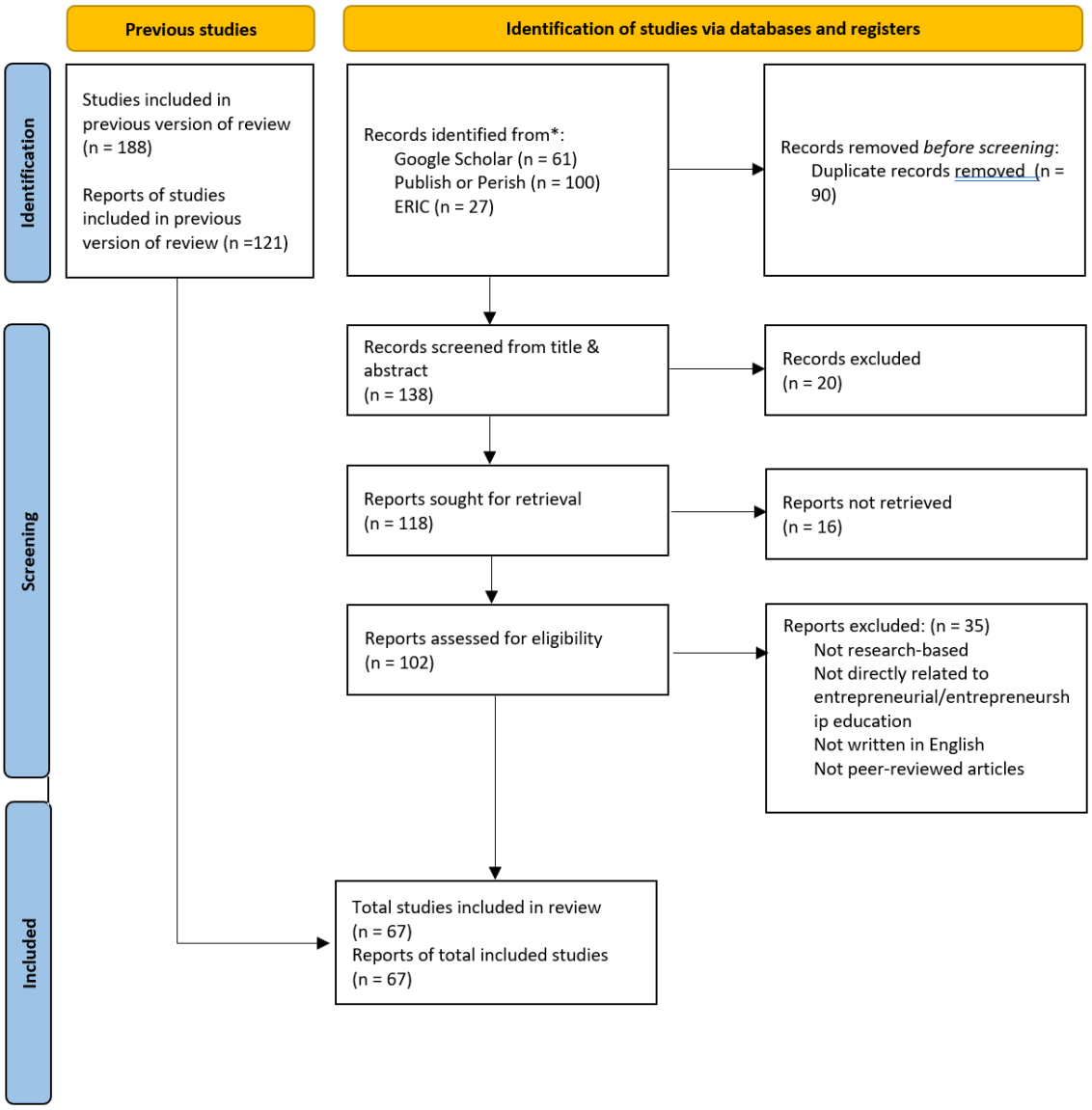


Figure 1. The selection process of full-text articles using PRISMA model

The screening stage involves reading the titles and abstracts of articles to assess their relevance to the research focus. Articles irrelevant to entrepreneurship education in Indonesia will be eliminated at this stage. Articles that pass the initial screening will then proceed to the eligibility stage, a comprehensive review of the article's content (full-text review). At this stage, researchers ensure that the articles meet all established inclusion criteria.

The final stage is determining which articles will be analyzed in the study. As many as 67 articles pass all selection stages and used as the primary source for data analysis. The entire selection process will be visualized in a PRISMA diagram to transparently and systematically show the number of articles at each selection stage.

3.5 Data Extraction and Synthesis

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Data obtained from selected articles were analyzed using thematic analysis techniques. This technique was used to identify key patterns, themes, and trends emerging in research on entrepreneurship education in Indonesia. Each article was read in-depth to identify key information related to the research objectives, methods used, learning models, and key findings.

During the analysis process, researchers categorized the articles based on several key variables. The first variable was educational level, such as elementary school, secondary school, university, and non-formal education. The second variable was the research approach used in investigating entrepreneurship education. Learning models were also identified for further elaboration of findings, such as project-based learning, experiential learning, digital business-based learning, and practice-based approaches. The third variable was the outcomes measured in the research, such as increased entrepreneurial competency, entrepreneurial interest, creativity, innovation, critical thinking skills, and work readiness. The fourth variable was the trend of keywords, reflecting emerging clusters of topics, their currency, and interconnectedness. Last but not least, the findings of each study were examined to generate valuable themes of insights from the dataset. The results were then presented descriptively in narrative form, tables, data visualizations using VOSViewer software, and explanations for the qualitative findings to facilitate comprehensive interpretation of the emerging themes of research results.

4. Results & Discussion

4.1 The trends on entrepreneurship education in previous studies in Indonesia over the last decade (2016-2025)

Number of publications each year

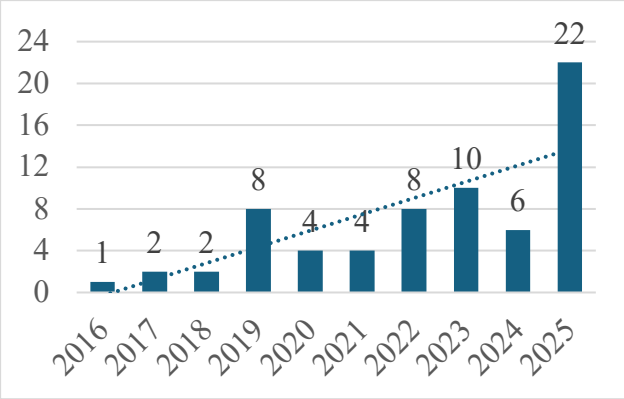


Figure 2. Number of research-based articles each year

Over the past decade, the number of publications related to entrepreneurship education has shown a slightly upward trend (see Figure 2). At the beginning of the period (2016–2018), the number was relatively low, only 1–2 publications per year, but began to surge in 2019 with 8 publications. The increase continued until it peaked in 2023 with 10 publications, before declining slightly in 2024. 2025 saw the highest point with 22 publications, indicating growing attention to entrepreneurship research in Indonesia.

Research variables

Over the past decade, research on entrepreneurship education has shown an increasingly broad and complex range of variables, as shown in Table 1.

Table 1. The existing research variables

Existing variables	Sample of studies

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Best practices & model development	Beth et al. 2016; Mulyadi et al., 2018; Purusottama & Akbar, 2019
Entrepreneurship curriculum & learning resources	Mashudi, 2025; Schroeder, 2017
Impacts of entrepreneurship education	Atrup et al., 2023; Ghina et al., 2017; Hairudinor et al., 2020; Hasan et al., 2019; Irawanto & Novianti, 2021; Kusmintarti et al., 2025; Suratno et al., 2019
Entrepreneurial traits and predictors among students	Permatasari & Agustina, 2018; Kartikaningrum & Andika, 2025; Saptono et al., 2020; Susantiningrum et al., 2023
Preferences in entrepreneurship education	Purusottama & Akbar, 2019; Yunita et al., 2025
Methods & approaches in entrepreneurship education	Adriyani & Malik, 2022; Agustia et al., 2023; Husein et al., 2025; Jamaluddin et al., 2019;

Initially, the focus was focused on best practices and model development (Beth et al., 2016; Purusottama & Akbar, 2019), then shifted to curriculum and learning resources (Schroeder, 2017; Mashudi, 2025). Subsequent trends have emphasized the impact of entrepreneurship education on attitudes, intentions, and business performance (Ghina et al., 2017; Hasan et al., 2019; Hairudinor et al., 2020). Furthermore, attention has been focused on student characteristics and predictors, such as self-efficacy and entrepreneurial orientation. Previous research also highlights students' preferences for entrepreneurship education (Purusottama & Akbar, 2019; Yunita et al., 2025) and innovative learning methods and approaches, including project-based and cultural approaches (Jamaluddin et al., 2019; Adriyani & Malik, 2022). Overall, this trend demonstrates a shift from a structural focus toward more contextual psychological, social, and pedagogical variables.

Research locus and participants

Table 2 below provides information regarding the research locus along with types of participants identified in the data set.

Table 2. The education levels being studied

Education levels	**Participants**	**Number of studies (n=67)**	**Sample of studies**
Primary and secondary education	Vocational high school students and boarding school students	9	Saptono et al., 2020; Karyaningsih, 2020; Shobirin et al., 2024; Walidayni et al., 2023

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Higher education	Undergraduate students	46	Permatasari & Agustina, 2018; Purmono, 2023
Non-formal education	Young entrepreneurs	2	Hairudinor et al., 2020; Ramadhan et al., 2024

The majority of the research in this matrix involved undergraduate students from various study programs at Indonesian universities, with approximately 25 studies. For example, Goldstein et al. (2016) studied 89 students from the Faculty of Economics at UNCEN, while Permatasari and Agustina (2018) involved 300 final-year students from three faculties at a private university. Additionally, vocational high school students appeared in six studies, such as Saptono et al. (2020) who studied 450 vocational high school students in Jakarta and Karyaningsih et al. (2020) with 351 vocational high school students. Vocational/diploma students were also a focus. Other studies involved elementary and high school students, such as Ayuningtyas et al. (2022) on students at Sari Bumi Islamic Elementary School in Sidoarjo and Hidayat et al. (2023) on students at Pasaman 1 State Senior High School. The review results also identified studies on young entrepreneurs/SMEs, for example, Hairudinor et al. (2020) with 300 SMEs in Indonesia and Ramadhan et al. (2024) with 184 young entrepreneurs in Central Java. A unique context emerges among Islamic boarding school students, such as the research by Shobirin et al. (2024) at the Fathul Ulum Islamic Boarding School in which this particular research group seems still under-explored in Indonesian context.

Research methods and data collection techniques

Table 3 below exhibits review results regarding the variety of research methods and techniques to collect the data identified in the data set.

Table 3. The research methods and techniques identified from previous studies

Research methods	**Data collection techniques**	**Number of studies (n=67)**	**Sample of studies**
Quantitative	Kuesioner (Likert, Google Form, TPB, SEM, PLS)	41	Saptono et al., 2020; Suratno et al., 2019; Susantiningrum et al., 2023
Qualitative	Observasi, wawancara, dokumentasi, FGD	9	Jamaluddin et al., 2019; Kholis et al., 2022
Mixed methods	Kombinasi kuesioner, wawanc	5	Ghufronudin et al., 2023; Goldstein

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	ara, observasi, FGD		et al., 2016
Action/classroom research	Observasi kelas, tugas proyek, laporan evaluasi	2	Goldstein et al., 2016

methods were used in approximately 5 studies, such as Goldstein et al. (2016) who combined observations, interviews, and focus group discussions (FGDs), and Schroeder (2017) who explored an applied curriculum using a train-the-trainers approach. However, studies applying a classroom action research approach are still limited.

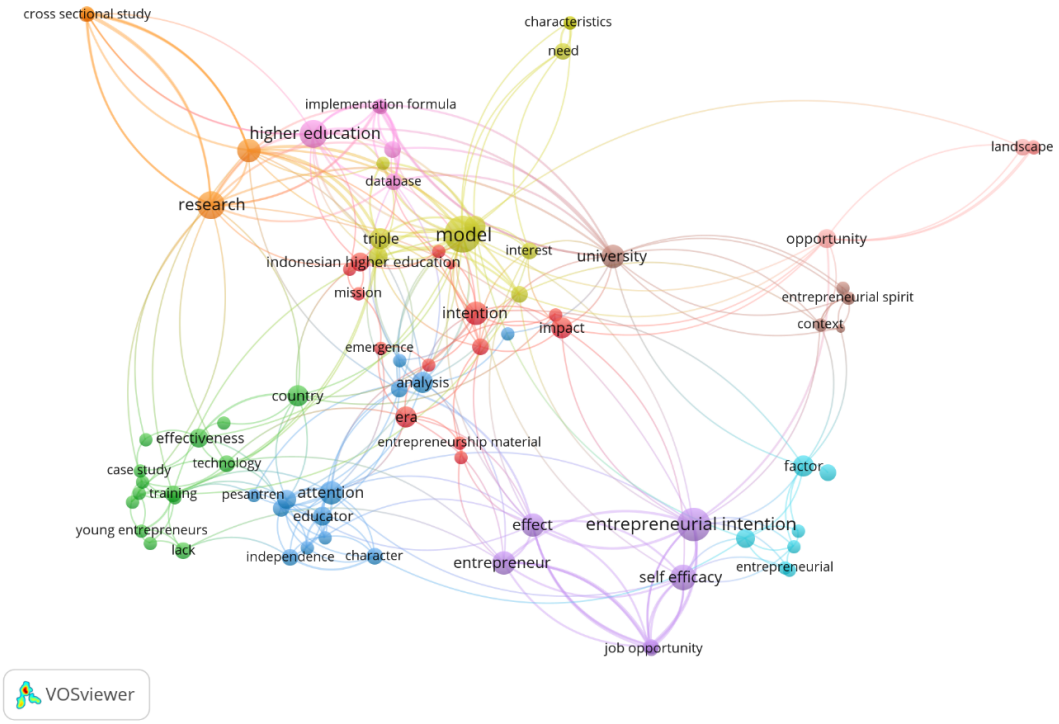


Figure 3. Network Visualization Result

The most dominant research method is quantitative, survey-based, and questionnaire-based, used in over 30 studies. Qualitative methods appeared in around 10 studies, such as Jamaluddin et al. (2019) who used observations and interviews with students at Universiti Putra Malaysia, and Kholis et al. (2022) who analyzed entrepreneurship programs at Islamic elementary schools through interviews and documentation. Mixed

Research Keywords related to Entrepreneurship Education

Figure 3 below displays the network visualization generated from the VOSViewer software; indicating the significance level of the relationship between each cluster.

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Table 4 depicts top five clusters of keywords in the studies reviewed.

The first five clusters demonstrate a clear link between the formal educational environment (Cluster 1, red color) and the effectiveness of entrepreneurship learning (Cluster 2, green color). Keywords such as "classroom," "course," and "government" are closely related to "case study," "teacher," and "technology," indicating that government policy and classroom curriculum design are the primary foundations for measuring the effectiveness of entrepreneurship education. Thus, entrepreneurship education in Indonesia relies not only on the materials and courses offered, but also on empirical evaluations that assess competencies and regional disparities.

Table 4. Top five clusters of keywords emerged from VOSViewer

Cluster 1 formal education environment	**Cluster 2 effectiveness of entrepreneurship education**	**Cluster 3 values, character, and socio-cultural context**	**Cluster 4 approaches and individual characteristics**	**Cluster 5 the relationship between entrepreneurship education and national economic development**
classroom	case study	analysis	alternative solution	effect
course	country	attention	arts & sciences	entrepreneur
emergence	data	character	characteristics	entrepreneurial intention
entrepreneurial interest	effectiveness	educator	entrepreneurial self efficacy	job opportunity
entrepreneurial university	entrepreneurial competence	entrepreneurship interest	interest	low number
entrepreneurship materials	entrepreneurship education	figure	model	national economic development
era	importance	independence	need	self efficacy
government	lack	Islamic boarding school	problem	strategic role
impact	reality	ministry	triple	
Indonesian	regional disparities	pesantren	woman	
higher education	teacher	society		
intention	technology	world		
mission	training			
person	young entrepreneurs			

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Cluster 3 (blue color) and 4 (light green color) broaden the perspective by emphasizing the dimensions of character, values, and self-efficacy. Keywords such as "character," "educator," "pesantren," and "society" (Cluster 3) emphasize the importance of the sociocultural context in shaping entrepreneurial interest, while "entrepreneurial self-efficacy," "alternative solution," and "woman" (Cluster 4) highlight psychological factors and alternative approaches that need to be considered. Comparing the two demonstrates that entrepreneurship education in Indonesia focuses not only on technical skills but also on character building, women's empowerment, and the search for innovative solutions to social problems.

Cluster 5 (purple color) then connects the dimensions of education to national economic development. Keywords such as entrepreneurial intention, job opportunity, and national economic development emphasize that the outcomes of the entrepreneurship education process contribute directly to job creation and economic growth. Comparing Clusters 1–4, a logical flow is evident: from policy and curriculum (Clusters 1–2), to character development and self-efficacy (Clusters 3–4), and finally to the macro impact on the national economy (Cluster 5). This synthesis demonstrates that the literature on entrepreneurship education in Indonesia positions education as a bridge between individual development and strategic contributions to national development.

Figure 4 below displays the overlay visualization generated from the

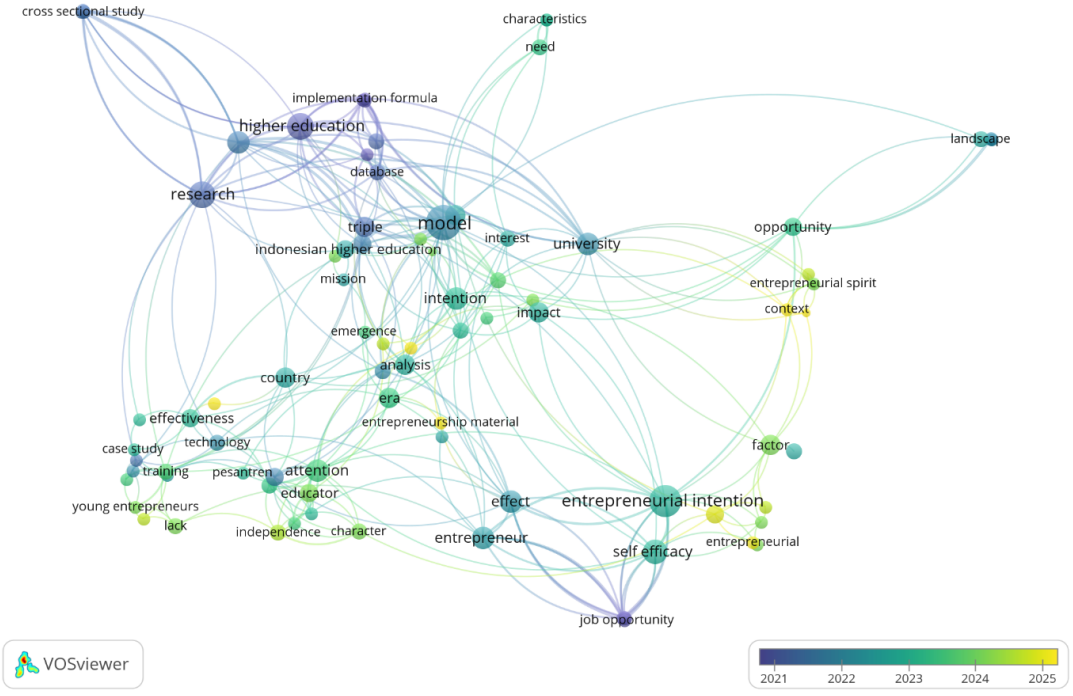


Figure 4. Overlay visualization results

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VOSViewer software; indicating the currency of the research keywords.

Each node represents a key term in research on entrepreneurship education and higher education in Indonesia, such as research, higher education, entrepreneurial intention, self-efficacy, and entrepreneurial spirit. The node size indicates the term's frequency or centrality in the literature, while the curved lines connecting the nodes show the relationship or co-occurrence between

universities, and self-efficacy with research opportunities and methods, confirming that entrepreneurship education in Indonesia is developing in an increasingly digital and socio-economic impact-oriented academic landscape.

Figure 5 below displays the density visualization generated from the VOSViewer software; indicating the saturation level of the relationship between each research keyword.

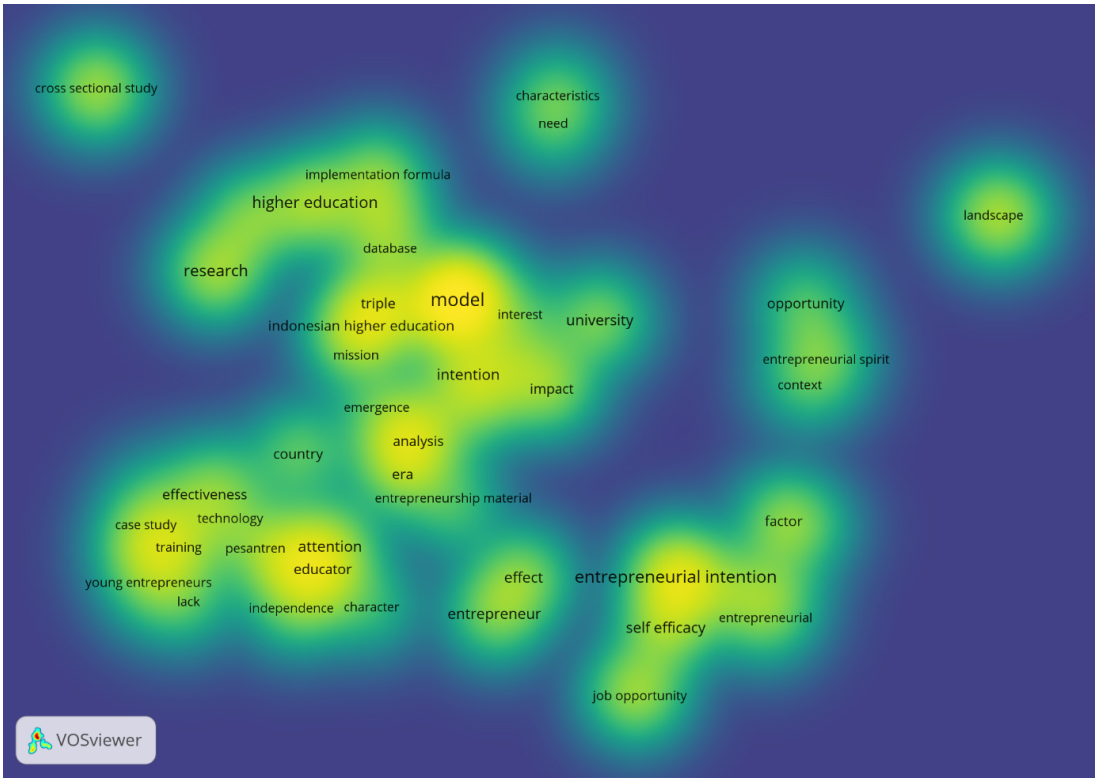


Figure 5. Density visualization results

keywords. The gradient from blue to yellow indicates the average publication year (2021–2025), allowing for a visualization of the temporal trend of the topic's development. Overall, this visualization illustrates the close relationship between entrepreneurial intention, the role of

Lighter areas indicate a stronger density of relationships between terms, such as model, intention, university, higher education, and research, which are central to the literature on entrepreneurship education in Indonesia. Other keywords, such as entrepreneurial intention, self-

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efficacy, opportunity, educator, and technology, form interconnected clusters, confirming that research in this area addresses not only academic and methodological aspects, but also psychological dimensions, economic opportunities, and the role of educators. Overall, this heatmap reveals a complex conceptual landscape, where entrepreneurship education is understood as a multidimensional phenomenon linking policies, individual characteristics, educational institutions, and socio-economic transformation.

4.2 Emerging themes of insights from previous studies

Curriculum Design and Implementation

The curriculum design of entrepreneurship education in Indonesia is increasingly diverse, encompassing compulsory courses, electives, and extracurricular activities at universities and vocational schools (Wahidmurni et al., 2019; Widodo et al., 2025). This structure emphasizes not only theory but also business practices, mentoring, and stakeholder engagement, including government, industry, and startups. Program effectiveness is evaluated through case studies, interviews, systematic reviews, and mixed methods such as fuzzy logic. The vocational focus emphasizes practical skills, industry collaboration, and mindset development to prepare graduates for employment and entrepreneurship.

As an output of curriculum implementation, the ultimate goal of this review is to strengthen the ideal entrepreneur profile. Therefore, this study also identifies how students embody the ideal entrepreneur profile. The research data synthesis includes character dimensions such as honesty (amanah), superior hard work (itqan), responsibility (mas'uliyah), and proactiveness and strong digital literacy (Ghufronudin et al., 2023). The combination of values between Millennials and Gen Z has created unique characteristics in the digital ecosystem, characterized by critical thinking, pragmatism, and an orientation toward uncertainty. In conclusion, this report emphasizes that the success of entrepreneurship education in Indonesia relies heavily on the integration of precise research methodologies, an experiential curriculum (co-curricular), and the strengthening of positive psychological capital to produce resilient and innovative entrepreneurs.

The implementation of entrepreneurship education in Indonesia has evolved into a strategic priority to reduce educated unemployment. The strategies implemented encompass a broad spectrum, from restructuring the formal curriculum to developing an experience-based support ecosystem. A synthesis of various case studies shows that implementation effectiveness is highly dependent on the pedagogical methods chosen, with traditional approaches being replaced by more interactive models.

Dominant implementation models include Project-Based Learning (PjBL) that produces tangible product outputs, e-learning integration, and the application of the Pancasila Student Profile (P5) values and Islamic ethical principles (Hidayat et

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al., 2023). Crucial findings from a policy perspective, as revealed by Purusottama and Akbar (2019), show that intracurricular-based entrepreneurship education often has no significant impact on student intention. Conversely, co-curricular activities and project-based learning have been shown to have a much stronger impact. This underscores the need for a reorientation from a classroom-based curriculum toward a more dynamic and practical learning ecosystem to ensure successful learning outcomes.

Successors and best practices

Identifying and replicating success factors is an essential step to accelerating the entrepreneurship rate in Indonesia through education. Educational success is determined not only by the quality of curriculum content but also by the interaction between individual self-efficacy, environmental support, and structured guidance. Best practices synthesized from various national research studies provide a blueprint for optimizing learning outcomes at the institutional level.

Determinants of success include high levels of self-efficacy (Suratno et al., 2019), supportive family environments (Samala et al., 2022), and qualified instructors who can act as adaptive facilitators (Safira et al., 2025). It is also demonstrated that emotional intelligence contributes to entrepreneurial interest. Furthermore, research by Paryanti et al. (2025) confirms that interpersonal collaboration in mentorship programs is a key factor in strengthening resilient character in Generation Z. However, achieving these good practices is often hampered by the reality of systemic challenges that still plague the national education landscape.

Outcomes of Entrepreneurship Education

Entrepreneurship mentoring models have proven effective when combining business team supervision, hands-on projects, incubator support, and industry engagement. For instance, Eryanto et al. (2019) found that vocational high school students in West Java perceived that the program could provide much input and assist the students to achove the outcomes. This approach fosters a stronger entrepreneurial mindset, resilience, behaviours, and skills, particularly when combined with creative project-based learning (Mulyadi et al., 2018; Permatasari & Agustina, 2018; Purusottama & Trilaksono, 2019; Setiawan et al., 2025). Furthermore, mentorship effectiveness increases when tailored to local cultural values, fostering a risk-taking attitude and independence appropriate to the Indonesian context.

Another outcome of entrepreneurship education is the increased digital literacy as an integral part of entrepreneurship curricula, playing a crucial role in enhancing students' entrepreneurial intentions and self-efficacy (Mulyono et al., 2023). Digital-based entrepreneurship education helps students identify opportunities, master digital tools, and prepare for the modern business world. The effect of digital literacy on entrepreneurial intentions is mediated by digital self-efficacy and an entrepreneurial

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mindset (Rahmi et al., 2025; Saptono et al., 2020), making technology integration key to adapting entrepreneurship education.

Cultural Adaptation and Contextualization

To escalate the positive outcomes, such pedagogical interventions should consider local values as an integral part in designing the curriculum and pedagogical practices. An entrepreneurship curriculum tailored to Indonesian cultural values, such as collectivism, harmony, and local wisdom (Setiawan et al., 2025), can foster previously under-recognized entrepreneurial traits, such as risk-taking and innovation. An experiential and culturally sensitive pedagogical approach has been shown to enhance students' self-efficacy and entrepreneurial orientation (, making education more

Challenges in Implementing Entrepreneurship Education

Despite significant progress, analysis of research from 2016-2025 reveals systemic barriers hindering the achievement of optimal learning outcomes. These challenges are structural and require policy interventions that go beyond micro-level curriculum changes. Understanding the disparity between expectations and reality is key to designing more targeted and sustainable solutions.

The challenges include a lack of real-world practice, low student mental readiness, and uneven program distribution across Indonesia (Maritz et al., 2022). Sukardi's (2023) use of the ServQual methodology revealed a worrying gap between student expectations and the actual competencies provided by universities, with actual scores consistently falling below expectations. Furthermore, data from Susantiningrum et al. (2023) shows that vocational high school students still score low in creative innovation, indicating that formal education is not yet fully effective in developing core competencies. These barriers collectively have the potential to degrade long-term business performance and hinder the emergence of ideal future entrepreneurs. Likewise, the evaluation in Eryanto's (2019) study showed high success in the context and product aspects, but still moderate in the input and process, so infrastructure and funding support are needed to maintain the sustainability of the program.

Implications from the Review Results

The entrepreneurship education ecosystem in Indonesia reflects an inclusive intervention strategy, encompassing target audiences from elementary school to professional practitioners in the MSME sector. This diversity of participants confirms that entrepreneurship is now viewed as a life skill that must be continuously internalized, not simply a business discipline at the higher education level. This heterogeneity of participant backgrounds provides a rich perspective for national data synthesis, although it demands careful generalization of research results.

The participants identified in the research database cover a broad spectrum, from Islamic elementary school students in Central Java learning about the values of honesty, to vocational students focusing on

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the creative industry, to young entrepreneurs mentored by the Central Java Youth and Sports Agency (Disporapar) (Ramadhan et al., 2024). The selection of participants spanning various social and geographic strata is crucial to ensuring that the developed theoretical framework has strong contextual relevance for each target group.

Within the analyzed literature, the topics of Entrepreneurial Intentions and the effectiveness of educational interventions emerged as the absolute dominant domains, as documented in the comprehensive study by Suratno et al. (2019). Conversely, there are research niches that are still embryonic but crucial for the future, such as Digital Lifelong Learning and the urgency of post-pandemic reskilling articulated by Hamburg (2021), as well as the internalization of Islamic entrepreneurial values at the primary education level. The dominance of the theme of intention reflects the policy focus on efforts to quantitatively increase the national entrepreneurial ratio, while these rare themes indicate prospective research opportunities that emphasize digital sustainability and strengthening character based on local values. Analysis of this thematic substance logically demands further review of the methodological rigor used to validate these findings.

The concrete implications of entrepreneurship education for educators emphasize the need for curriculum design that integrates formal instruction with mentoring, digital literacy, and experiential learning. Learning content must also be sensitive to local cultures and address gender-specific needs to be more relevant and inclusive. Furthermore, ongoing support through mentorship and alumni networks is crucial for sustaining students' entrepreneurial intentions after graduation. However, significant barriers to the development of technopreneurship and digital adoption exist, such as financial constraints and inadequate government incentives, particularly for women and entrepreneurs in rural areas (Hasan, 2026; Putri & Anggraini, 2025). Unequal access to digital resources and training further widens the gap, while gender norms, regulatory complexity, and a lack of institutional coordination present additional barriers. This combination of factors suggests that while entrepreneurship education has significant potential, its successful implementation depends heavily on systemic support and more inclusive policies.

5. CONCLUSION

A review of the current literature on entrepreneurship education reveals several limitations that create knowledge gaps. Most research is still confined to specific databases and publication periods, creating a significant potential for selection bias. Furthermore, the limited research at the elementary school level indicates a lack of attention to fostering an entrepreneurial spirit from an early age. The lack of technology integration, particularly related to AI and digital entrepreneurship, also presents a significant gap in MSME curricula and practices. Furthermore,

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longitudinal studies assessing the sustainability of the impact of entrepreneurship education are rare, making it difficult to determine the long-term persistence of these effects.

To address this gap, future research needs to be more diverse and inclusive. Longitudinal and regional studies can help assess sustainability and variation in outcomes across local contexts. Data-driven approaches such as machine learning and big data can be used to more comprehensively map the entrepreneurial ecosystem. Furthermore, research on green and social entrepreneurship is crucial for linking education to sustainable business models. Cultural alignment also needs to be further explored to make local adaptation strategies more effective. Finally, a focus on marginalized groups such as women and entrepreneurs in rural areas will enrich understanding and strengthen the inclusiveness of entrepreneurship education.

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