

Mapping the Intellectual Structure of Entrepreneurship Education and Student Entrepreneurial Intentions: A Scientometric Analysis

Yang Yubao^{1*}, Radin Siti Aishah Radin A Rahman²

¹Faculty of Education, Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia
Email: P145601@siswa.ukm.edu.my

²Faculty of Education, Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia
Email: radin@ukm.edu.m

ABSTRACT

CORRESPONDING

AUTHOR (*):

Yang Yubao
(P145601@siswa.ukm.edu.my)

KEYWORDS:

Entrepreneurship education
Entrepreneurial intention
Scientometric analysis
Higher education
Research trends

CITATION:

Yang, Y., & Radin Siti Aishah, R. A. R. (2026). Mapping the Intellectual Structure of Entrepreneurship Education and Student Entrepreneurial Intentions: A Scientometric Analysis. *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, 11(10), e004126. <https://doi.org/10.47405/mjssh.v11i10.4126>

This study conducts a scientometric analysis of research on entrepreneurship education and student entrepreneurial intentions based on 1,605 Scopus-indexed publications from 1997 to 2025. Using BiblioMagika, the study identifies influential authors (e.g., Liñán, Duong), key journals (Frontiers in Psychology, Sustainability), and dominant themes such as “entrepreneurial intention,” “self-efficacy,” and the “theory of planned behaviour.” The field has experienced rapid growth since 2015, with emerging topics including sustainability, digital entrepreneurship, and cross-cultural studies. Findings offer insights into the intellectual structure, thematic evolution, and future directions of this research domain.

1. Introduction

In recent years, the nexus between entrepreneurship education (EE) and student entrepreneurial intentions (SEI) has garnered intensified academic interest, particularly within higher education institutions aiming to foster innovation and self-employment. Amidst global shifts toward knowledge economies and digital transformation, entrepreneurship is increasingly promoted not only as a vocational pursuit but also as a key competence that enhances personal agency and economic participation among university students (Karimi et al., 2023; Wang & Zhang, 2024). Consequently, understanding the intellectual evolution and emerging frontiers of this research domain is crucial for aligning educational strategies with dynamic entrepreneurial ecosystems.

From an educational perspective, the focus on entrepreneurship education transcends purely economic considerations and is closely tied to deeper issues of higher education reform. Traditionally, universities have been viewed as institutions of knowledge and transmitters of knowledge. However, with society's growing demand for innovation and practical skills, universities are undergoing a fundamental shift in their role, evolving

into core incubators within the entrepreneurial ecosystem. This shift requires a shift in educational models from passive knowledge transfer to active capacity building, particularly in addressing youth unemployment and promoting economic development. However, this shift in role also presents challenges, including curriculum flexibility, faculty development, and measuring the long-term effectiveness of entrepreneurship education.

Empirical research over the past two decades has explored various antecedents of SEI, drawing on foundational models such as Ajzen's Theory of Planned Behavior (TPB) and Bandura's Social Cognitive Theory (Hassan et al., 2022). These theories provide a solid cognitive framework for understanding students' entrepreneurial intentions, emphasizing the key role of psychological variables such as attitudes, subjective norms, and self-efficacy. However, to more fully explain the impact of entrepreneurship education, it is necessary to integrate it with core educational theories. For example, practical projects, business competitions, and incubator experiences commonly used in entrepreneurship education are manifestations of experiential and situational learning. By enabling students to apply knowledge in real or simulated situations, these learning models can significantly enhance their perceived entrepreneurial capabilities (i.e., self-efficacy) and internalize the mindset and behavioral habits unique to entrepreneurs. Therefore, the true effectiveness of entrepreneurship education lies in how it seamlessly integrates theoretical knowledge with practical experience, transforming students from passive learners to active actors and effectively shaping their entrepreneurial intentions.

However, the field lacks a comprehensive scientometric overview that captures the structure, growth trajectory, influential contributors, and knowledge clusters of this rapidly developing discipline. Therefore, this study aims to fill this gap by addressing three core research questions:

RQ1: What are the most influential authors, institutions, and source publications in the field of entrepreneurship education and student entrepreneurial intentions?

RQ2: What are the core themes, high-impact keywords, and theoretical foundations influencing research on entrepreneurship education and student entrepreneurial intentions? RQ3: How has the knowledge structure of this research field evolved over time, and what are the emerging trends and future research directions?

To address these questions, this study employs a scientometric approach grounded in bibliographic data extracted from Scopus. Using tools such as BiblioMagika, the analysis identifies not only patterns in productivity and citation impact but also the thematic evolution of the field.

2. Methods

To investigate the scholarly landscape surrounding entrepreneurship education and student entrepreneurial intentions, this study adopted a scientometric approach, drawing on bibliometric data retrieved from the Scopus database. Scopus was selected due to its comprehensive interdisciplinary coverage, rigorous indexing standards, and compatibility with advanced bibliometric tools such as BiblioMagika (Singh et al., 2021). Data extraction was conducted on July 14, 2025. The search focused on publications that examine the relationship between entrepreneurship education and entrepreneurial intentions among students in higher education settings. A Boolean search query was

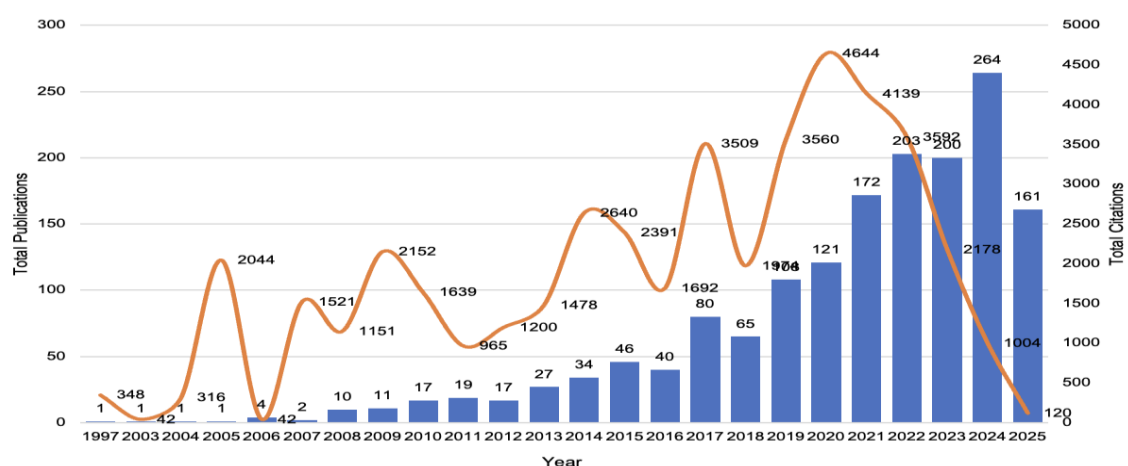
applied to the title, abstract, and keyword fields using the following search string: TITLE-ABS-KEY ("entrepreneurship education" AND "entrepreneurial intention" AND ("university student" OR "college student" OR "higher education" OR "undergraduate" OR "college" OR "university")). This initial search yielded 1,605 records. To ensure the relevance and academic rigor of the dataset, a multi-step data refinement process was implemented. This included the removal of duplicate entries, editorials and book chapters, conference summaries and non-peer-reviewed materials, retracted or incomplete publications. Only peer-reviewed journal articles were retained for analysis. After applying these inclusion and exclusion criteria, a total of 1,352 documents remained, which served as the final corpus for scientometric analysis. These records were analyzed to map the intellectual structure, thematic evolution, influential contributors, and geographical distribution within the field of entrepreneurship education and student entrepreneurial intentions. The dataset was imported into BiblioMagika for visualization and network analysis.

3. Results

3.1 Annual Scientific Production

Figure 1 illustrates the annual scientific production related to entrepreneurship education and student entrepreneurial intentions from 1997 to 2025. During the early years (1997–2007), research output remained minimal, with fewer than five publications per year and negligible citation activity—indicating the embryonic stage of scholarly interest in the domain. A modest growth phase began post-2008. From 2015 onward, the field entered a phase of accelerated development. The number of publications rose from 46 in 2015 to 172 in 2020. The year 2022 marked a turning point, with 203 publications and over 3500 citations, representing a peak in both productivity and impact. Although citations declined in 2024 (potentially due to citation lag), the number of publications reached an all-time high of 264.

Figure 1: Publication trends and growth phases



Sources: Author's own work

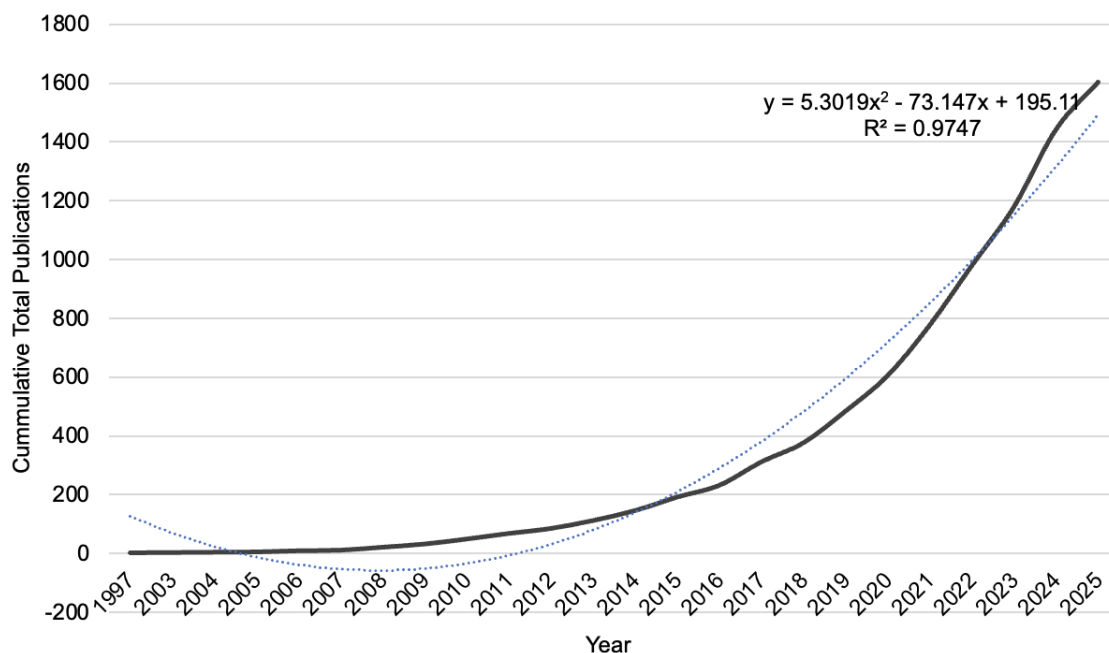
Figure 2 presents the cumulative growth curve of publications in the field of entrepreneurship education and student entrepreneurial intentions from 1997 to 2025. The trend line reveals a distinct upward trajectory, particularly pronounced from 2015 onwards. A quadratic regression model was applied to fit the cumulative data, yielding the equation:

$$y = 5.3019x^2 - 73.147x + 195.11,$$

$$R^2 = 0.9747$$

The high coefficient of determination ($R^2=0.9747$) indicates a strong goodness-of-fit, suggesting that the growth pattern closely follows a quadratic curve. This trajectory confirms that scholarly interest in the field has expanded at an accelerating rate. The cumulative publication volume surpassed 1,000 by 2022 and approached 1,600 by 2025. The observed polynomial growth suggests that the field is moving beyond a linear expansion, entering a stage of exponential consolidation with increasing contributions from interdisciplinary and international collaborations. Such a pattern is indicative of a research domain that has transitioned from niche relevance to mainstream academic and policy significance. The predictive value of the model also implies sustained future growth if current trends continue.

Figure 2: Cumulative Growth of Publications Over Time



Sources: Author's own work

Table 1 presents the annual trends in publication productivity and citation impact from 1997 to 2025. Over this 29-year period, a total of 1,605 publications were produced, accumulating 44,341 citations, with an average of 27.63 citations per publication (C/P) and 33.62 citations per cited publication (C/CP). These metrics reflect a strong and growing scholarly interest in the domain of entrepreneurship education and student entrepreneurial intentions. The early years (1997–2007) were marked by sporadic activity with very few publications but disproportionately high citation counts. Notably, single papers in 2005 and 2007 garnered over 2,000 and 1,500 citations respectively, indicating the foundational influence of early landmark studies. A steady increase in output began in 2008, with significant growth in both total publications (TP) and cited publications (NCP). Between 2015 and 2022, the field experienced its most productive phase, with annual publications exceeding 100, peaking at 203 papers in 2022. During this period, the h-index and g-index rose considerably, reflecting both the quantity and sustained impact of published work. However, a notable drop in citations is observed in 2023 and 2024, despite publication numbers remaining high. This lag is likely due to the natural delay in citation accrual for newly published works. In 2025, although 161

papers were produced, only 44 were cited, with a low average of 0.75 citations per paper, underscoring the citation delay effect. The field's cumulative h-index of 92 and g-index of 171 further underscore its academic maturity, while the m-index of 3.172 (indicating productivity relative to career length) suggests sustained influence over time.

Table 1: Annual Research Output and Citation Metrics

Year	TP	NCA	NCP	TC	C/P	C/CP	h	g	m
1997	1	2	1	348	348.00	348.00	1	1	0.034
2003	1	2	1	42	42.00	42.00	1	1	0.043
2004	1	2	1	316	316.00	316.00	1	1	0.045
2005	1	3	1	2044	2044.00	2044.00	1	1	0.048
2006	4	11	3	42	10.50	14.00	3	4	0.150
2007	2	4	2	1521	760.50	760.50	2	2	0.105
2008	10	24	10	1151	115.10	115.10	7	10	0.389
2009	11	30	11	2152	195.64	195.64	8	11	0.471
2010	17	53	17	1639	96.41	96.41	13	17	0.813
2011	19	43	18	965	50.79	53.61	11	19	0.733
2012	17	51	17	1200	70.59	70.59	10	17	0.714
2013	27	59	26	1478	54.74	56.85	15	27	1.154
2014	34	83	31	2640	77.65	85.16	18	34	1.500
2015	46	129	44	2391	51.98	54.34	22	46	2.000
2016	40	127	39	1692	42.30	43.38	18	40	1.800
2017	80	248	77	3509	43.86	45.57	32	58	3.556
2018	65	186	65	1974	30.37	30.37	25	43	3.125
2019	108	328	100	3560	32.96	35.60	33	58	4.714
2020	121	401	115	4644	38.38	40.38	36	66	6.000
2021	172	573	156	4139	24.06	26.53	37	57	7.400
2022	203	693	189	3592	17.69	19.01	31	48	7.750
2023	200	694	177	2178	10.89	12.31	25	35	8.333
2024	264	873	174	1004	3.80	5.77	15	19	7.500
2025	161	579	44	120	0.75	2.73	6	8	6.000
	160								
Total	5	5198	1319	44341	27.63	33.62	92	171	3.172

Sources: Author's own work

3.2 Source Analysis

Table 2 displays the distribution of publications across subject areas, highlighting the multidisciplinary nature of research on entrepreneurship education and student entrepreneurial intentions. The majority of the literature is concentrated in Business, Management and Accounting (938 publications, 58.44%) and Social Sciences (789 publications, 49.16%). Other prominent domains include Economics, Econometrics and Finance (22.24%) and Computer Science (11.53%). Smaller but notable contributions also stem from Engineering (9.03%) and Psychology (7.54%), indicating crossovers with innovation systems and cognitive-behavioral research. Fields such as Environmental Science (6.48%) and Energy (4.74%) signal a growing scholarly interest in sustainable entrepreneurship and green innovation. Less represented areas—such as Medicine, Neuroscience, Agricultural and Biological Sciences, and Nursing—demonstrate limited but emerging engagement with entrepreneurship from health, life sciences, and rural development perspectives. This subject-wise distribution underscores the increasingly interdisciplinary integration of entrepreneurship education, moving beyond business

schools into science, technology, sustainability, and societal well-being frameworks. The presence of Multidisciplinary outlets (2.18%) further supports the idea that the field is becoming more inclusive and cross-cutting in scope.

Table 2: Publication By Subject Area

Subject Area	TP	%
Business, Management and Accounting	938	58.44%
Social Sciences	789	49.16%
Economics, Econometrics and Finance	357	22.24%
Computer Science	185	11.53%
Engineering	145	9.03%
Psychology	121	7.54%
Decision Sciences	113	7.04%
Environmental Science	104	6.48%
Energy	76	4.74%
Arts and Humanities	49	3.05%
Mathematics	38	2.37%
Multidisciplinary	35	2.18%
Medicine	13	0.81%
Physics and Astronomy	12	0.75%
Health Professions	11	0.69%
Agricultural and Biological Sciences	10	0.62%
Biochemistry, Genetics and Molecular Biology	10	0.62%
Materials Science	10	0.62%
Earth and Planetary Sciences	7	0.44%
Chemical Engineering	6	0.37%
Chemistry	6	0.37%
Neuroscience	4	0.25%
Pharmacology, Toxicology and Pharmaceutics	4	0.25%
Immunology and Microbiology	2	0.12%
Nursing	1	0.06%
Veterinary	1	0.06%

Sources: Author's own work

Table 3 highlights the most productive and influential source titles in the field of entrepreneurship education and student entrepreneurial intentions. Among them, *Frontiers in Psychology* emerges as the leading outlet, with 64 publications, 1853 citations, and a high h-index of 23. *Sustainability (Switzerland)* ranks second with 55 papers and the highest total citation count (1885), along with a strong g-index of 43 and C/CP (citations per cited publication) of 37.70. Other notable journals include *Cogent Business and Management* and *Heliyon*, which show moderate productivity paired with solid citation performance. The presence of several conference proceedings (e.g., *Springer Proceedings in Business and Economics*, *ACM International Conference Proceeding Series*) and engineering-oriented outlets (e.g., *Lecture Notes in Networks and Systems*) suggests that the field is also developing across interdisciplinary and applied technical contexts. While journals like *Environmental Science and Pollution Research* and *Journal of Asian Finance, Economics and Business* may only contribute one or two articles each, their high average citation per article (e.g., 39.00 for *Environmental Science and Pollution Research*) indicates substantial influence on specific research directions.

Table 3: Most Productive Source Title

Source Title	TP	NCA	NCP	TC	C/P	C/CP	h	g	m
Frontiers in Psychology	64	243	63	1853	28.95	29.41	23	41	3.286
Sustainability (Switzerland)	55	219	50	1885	34.27	37.70	21	43	2.100
Cogent Business and Management	27	114	21	388	14.37	18.48	11	19	1.100
Springer Proceedings in Business and Economics	13	31	6	14	1.08	2.33	2	3	0.286
Lecture Notes in Networks and Systems	8	35	5	26	3.25	5.20	3	5	0.750
Heliyon	7	25	7	85	12.14	12.14	4	7	0.800
International Journal of Innovation, Creativity and Change	7	17	7	48	6.86	6.86	5	6	0.714
World Review of Entrepreneurship, Management and Sustainable Development	6	19	4	22	3.67	5.50	3	4	0.231
International Journal of Advanced and Applied Sciences	5	22	3	15	3.00	5.00	3	3	0.500
Proceedings of the International Conference on Industrial Engineering and Operations Management	4	16	3	9	2.25	3.00	1	3	0.200
Quality - Access to Success	4	16	2	5	1.25	2.50	2	2	0.500
International Journal of Scientific and Technology Research	3	7	2	10	3.33	5.00	2	3	0.250
Journal of Asian Finance, Economics and Business	3	14	3	45	15.00	15.00	3	3	0.500
ACM International Conference Proceeding Series	2	7	1	1	0.50	1.00	1	1	0.250
Journal of Educational and Social Research	2	7	1	5	2.50	5.00	1	2	0.250
IOP Conference Series: Earth and Environmental Science	2	5	2	21	10.50	10.50	2	2	0.286
Corporate Governance and Organizational Behavior Review	2	6	2	12	6.00	6.00	1	2	0.250
Environmental Science and Pollution Research	1	3	1	39	39.00	39.00	1	1	0.333
Contaduria y Administracion	1	4	1	1	1.00	1.00	1	1	0.333
Accounting, Finance, Sustainability, Governance and Fraud	1	2	1	1	1.00	1.00	1	1	0.333

Sources: Author's own work

Figure 3 visualizes the top 20 most influential source titles based on h-index, reflecting both productivity and citation impact within the domain of entrepreneurship education and student entrepreneurial intentions. Notably, *Frontiers in Psychology* ranks first with an h-index of 23. *Sustainability (Switzerland)* follows closely with an h-index of 21. These two journals lead not only in publication volume but also in consistent citation performance. *Cogent Business and Management* ranks third with an h-index of 11, establishing itself as a key open-access outlet for practical and theoretical contributions. Other journals such as *Heliyon*, *International Journal of Innovation, Creativity and Change*, and *Journal of Asian Finance, Economics and Business* also show strong performance, with h-indices ranging between 3 and 5. The presence of conference proceedings (e.g., *Lecture Notes in Networks and Systems*, *Springer Proceedings in Business and Economics*) in the top 20.

Figure 3: Top 20 Most Influential Source Title by H-Index



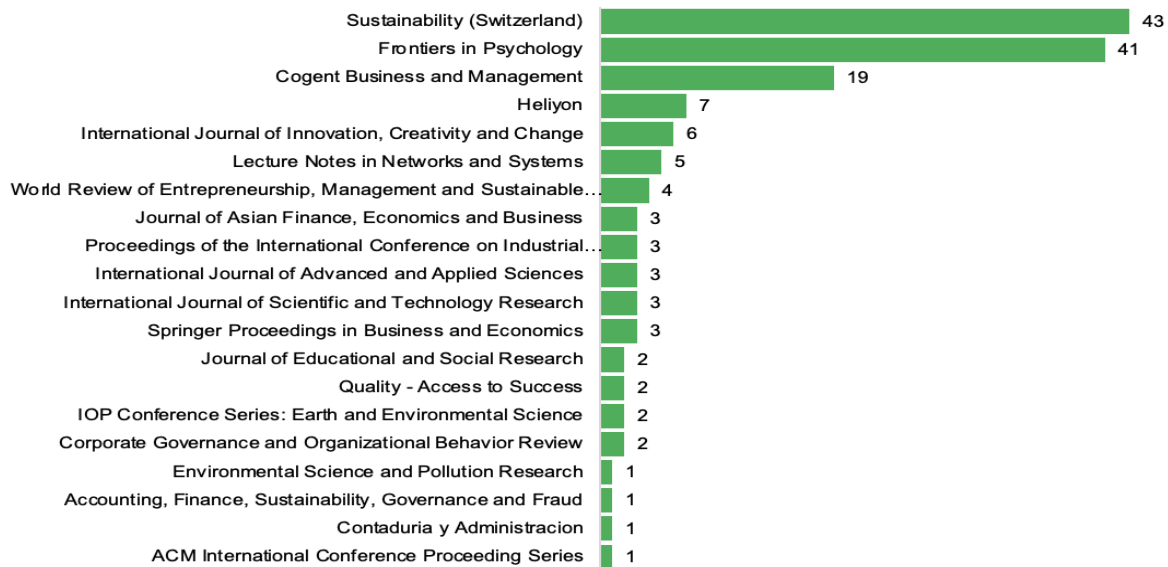
Sources: Author's own work

Figure 4 presents the top 20 source titles ranked by g-index. *Sustainability (Switzerland)* tops the list with a g-index of 43, followed closely by *Frontiers in Psychology* at 41, reaffirming their dual dominance in both productivity and citation influence. *Cogent Business and Management* ranks third with a g-index of 19, indicating a moderate but consistent citation impact across its publications. Meanwhile, *Heliyon* and the *International Journal of Innovation, Creativity and Change* also show strong performance (g-indexes of 7 and 6, respectively). The inclusion of *Lecture Notes in Networks and Systems*, *World Review of Entrepreneurship, Management and Sustainable Development*, and various conference proceedings (e.g., *Proceedings of the International Conference on Industrial Engineering and Operations Management*) indicates that impactful research is not limited to traditional journals but also disseminated through interdisciplinary and applied venues.

Table 4 highlights the top-cited scholarly contributions that have significantly shaped the field of entrepreneurship education and entrepreneurial intention. Leading the list is Zhao et al. (2005), whose study on the mediating role of self-efficacy amassed 2,044 citations, with an impressive 97.33 citations per year (C/Y). Other seminal works include Wilson et al. (2007) and Bae et al. (2014), which further emphasize the interplay

between gender, education, and entrepreneurial self-efficacy. Nabi et al. (2017) achieved the highest average annual citation rate (119.67 C/Y). Several studies, such as Oosterbeek et al. (2010), McGee et al. (2009), and Piperopoulos & Dimov (2015), critically examine how entrepreneurship education influences self-efficacy, skills, and intentions—validating education as both an antecedent and a modifier in entrepreneurial behavior models.

Figure 4: Top 20 Most Influential Source Title by G-Index



Sources: Author's own work

Table 4: Highly Cited Documents

Author(s)	Title	TC	C/Y
Zhao et al. (2005)	The mediating role of self-efficacy in the development of entrepreneurial intentions	2044	97.33
Wilson et al. (2007)	Gender, entrepreneurial self-efficacy, and entrepreneurial career intentions: Implications for entrepreneurship education	1451	76.37
Bae et al. (2014)	The Relationship Between Entrepreneurship Education and Entrepreneurial Intentions: A Meta-Analytic Review	1163	96.92
Nabi et al. (2017)	The impact of entrepreneurship education in higher education: A systematic review and research agenda	1077	119.67
Oosterbeek et al. (2010)	The impact of entrepreneurship education on entrepreneurship skills and motivation	1017	63.56
Mcgee et al. (2009)	Entrepreneurial self-efficacy: Refining the measure	924	54.35
Zhang et al. (2014)	The role of entrepreneurship education as a predictor of university students' entrepreneurial intention	512	42.67
Piperopoulos & Dimov (2015)	Burst Bubbles or Build Steam? Entrepreneurship Education, Entrepreneurial Self-Efficacy, and Entrepreneurial Intentions	512	46.55
Liñán (2008)	Skill and value perceptions: How do they affect entrepreneurial intentions?	458	25.44
Nowiński et al. (2019)	The impact of entrepreneurship education, entrepreneurial self-efficacy and gender on entrepreneurial intentions of university students in	454	64.86

Bolton & Lane (2012)	the Visegrad countries Individual entrepreneurial orientation: Development of a measurement instrument	448	32.00
Maresch et al. (2016)	The impact of entrepreneurship education on the entrepreneurial intention of students in science and engineering versus business studies university programs	434	43.40
Karimi et al. (2016)	The Impact of Entrepreneurship Education: A Study of Iranian Students' Entrepreneurial Intentions and Opportunity Identification	359	35.90
Kolvereid & Moen (1997)	Entrepreneurship among business graduates: does a major in entrepreneurship make a difference?	348	12.00
Sánchez (2011)	University training for entrepreneurial competencies: Its impact on intention of venture creation	329	21.93
Jena (2020)	Measuring the impact of business management Student's attitude towards entrepreneurship education on entrepreneurial intention: A case study	319	53.17
Nabi et al. (2018)	Does entrepreneurship education in the first year of higher education develop entrepreneurial intentions? The role of learning and inspiration	316	39.50
Franke & Lüthje (2004)	Entrepreneurial intentions of business students - A benchmarking study	316	14.36
Pruett et al. (2009)	Explaining entrepreneurial intentions of university students: A cross-cultural study	313	18.41
Wu & Wu (2008)	The impact of higher education on entrepreneurial intentions of university students in China	311	17.28

Sources: Author's own work

3.3 Author Analysis

Table 5 presents the distribution of author counts per publication. Among the 1,605 total publications, the majority were authored by two (376 papers) or three (446 papers) contributors, suggesting a strong tendency toward small-scale collaborative research teams. Solo-authored papers account for 164 publications.

Table 5: Author Count Distribution per Publication

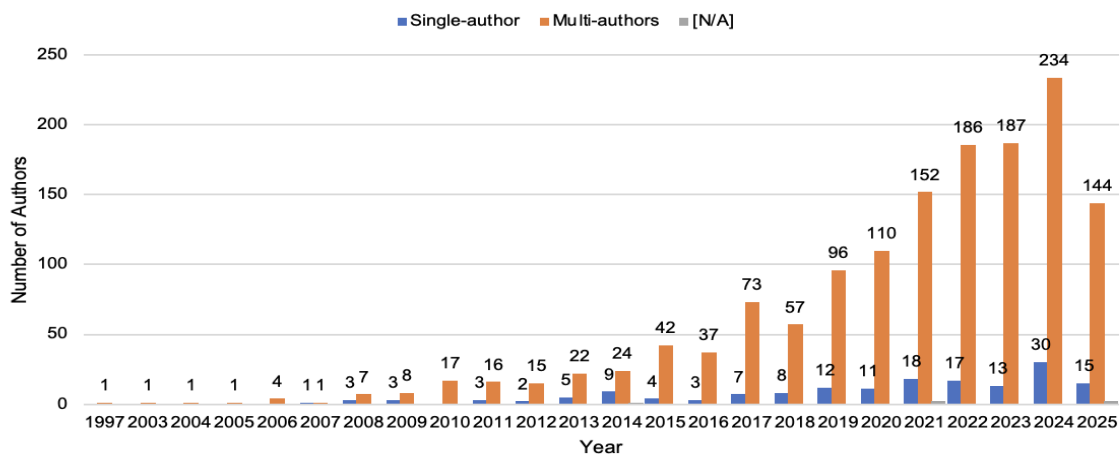
Author Count	Frequency
0	5
1	164
2	376
3	446
4	333
5	152
6	80
7	31
8	11
9	4
10	2
11	1
Grand Total	1605

Sources: Author's own work

A small number of publications involved larger research teams, with 31 papers having seven authors and a few extreme cases involving 10 or more authors. Only 5 records were found with zero listed authors, likely due to data inconsistencies or indexing limitations in the database.

Figure 5 illustrates the temporal dynamics of authorship patterns from 1997 to 2025. Over time, there has been a clear and consistent rise in multi-author publications, especially since 2015, aligning with the expansion and institutionalization phase of the field. For instance, by 2024, multi-authored contributions peaked at 234, while single-authored outputs remained comparatively low, at 30.

Figure 5: Temporal Trend in Single-Author and Multi-Author Publications



Sources: Author's own work

Table 5 and Figure 5 reflect a mature and networked scholarly community, where both individual expertise and team-based research play complementary roles in shaping the intellectual landscape of the field.

Table 6 highlights the most productive authors in the field, measured by total publications (TP), citations (TC), and citation averages. Duong, Cong Doanh (Vietnam) and Narmaditya, Bagus Shandy (Indonesia) each produced 15 articles, with high non-collaborative publication (NCP) rates and strong h- and g-indexes, reflecting consistent and individual contributions. Wibowo, Agus, also from Indonesia, matched this impact with a perfect NCP score (13/13) and the highest h-index (9). Citation-wise, Liñán, Francisco (United Kingdom) significantly outperforms peers with 2,352 total citations and an outstanding C/P and C/CP of 294. Though his m-index (0.444) is relatively modest due to earlier publication years, his influence remains unrivaled. Among high-impact contemporary authors, Saleem, Imran (Oman) and Anwar, Imran (India) demonstrate exceptional citation efficiency, both with 556 citations from 9 papers and an impressive C/P of 61.78. Their m-index of 1.333 indicates high yearly productivity and influence over a relatively short research span. Authors from Finland—Viljamaa and Varamäki—as well as Gomes from Portugal contribute to cross-national dialogue in entrepreneurship education, with moderate productivity and strong citation averages (e.g., Gomes: C/P = 18.00; m = 1.200). Overall, the author landscape is geographically diverse, with notable clusters of productivity and intellectual leadership emerging from Southeast Asia, Europe, and the Middle East.

Table 6: Most Productive Author

Name	Country	TP	NCP	TC	C/P	C/CP	h	g	m
Duong, Cong Doanh	Viet Nam	15	12	257	17.13	21.42	9	15	2.250
Narmaditya, Bagus Shandy	Indonesia	15	13	272	18.13	20.92	8	15	1.333
Wibowo, Agus Sahinidis,	Indonesia	13	13	280	21.54	21.54	9	13	1.286
Alexandros G. Saleem, Imran	Greece	9	7	35	3.89	5.00	4	5	0.571
Anwar, Imran	Oman	9	9	556	61.78	61.78	8	9	1.333
Viljamaa, Anmari	India	9	9	556	61.78	61.78	8	9	1.333
Varamäki, Elina	Finland	8	6	280	35.00	46.67	5	8	0.385
Gomes, Sofia	Finland	8	6	280	35.00	46.67	5	8	0.385
LiñáN, Francisco	Portugal	8	7	144	18.00	20.57	6	8	1.200
	United Kingdom			235	294.0				
		8	8	2	0	294.00	8	8	0.444

Sources: Author's own work

Table 7 presents the most productive institutions in the field of entrepreneurship education and student entrepreneurial intentions. The National Economics University in Vietnam leads with 54 publications and 788 citations, reflecting its prominent regional contribution. It is closely followed by Universitas Negeri Malang (Indonesia) with 45 publications and a respectable total citation (TC) count of 402. Malaysia emerges as a major hub in this field, with five universities in the top ten: Universiti Putra Malaysia, Universiti Utara Malaysia, Universiti Teknologi MARA, Universiti Kebangsaan Malaysia, and Universiti Teknologi Malaysia. Among them, Universiti Putra Malaysia is particularly notable with a perfect NCP-to-TP ratio (33/33) and 437 citations. In terms of citation efficiency, Wenzhou Medical University (China) stands out with 1,707 citations from 26 papers, followed by Aligarh Muslim University (India) with 1,555 citations from 23 publications. Similarly, Seinäjoki University of Applied Sciences (Finland) achieves high visibility with 841 citations from 26 papers. University of Beira Interior (Portugal), Dhurakij Pundit University (Thailand), and Stanford University (United States), each contributing with fewer but highly cited works.

Table 7: Top 10 Most Productive Institutions

Institution	Country	TP	NCP	TC	C/P
National Economics University	Viet Nam	54	NR	42	788
Universitas Negeri Malang	Indonesia	45	NR	35	402
University of West Attica	Greece	38	NR	30	138
Universiti Putra Malaysia	Malaysia	33	NR	33	437
King Faisal University	Saudi Arabia	31	NR	20	554
Universiti Utara Malaysia	Malaysia	31	NR	27	495
Universitas Negeri Jakarta	Indonesia	29	NR	29	462
Universiti Teknologi MARA	Malaysia	28	NR	17	119
Universiti Kebangsaan Malaysia	Malaysia	28	3	24	170
Universiti Teknologi Malaysia	Malaysia	27	NR	20	212
Seinäjoki University of Applied Sciences	Finland	26	NR	19	841
Wenzhou Medical University	China	26	NR	26	1707
University of Beira Interior	Portugal	24	NR	23	735

Ho Chi Minh City Open University	Viet Nam	23	NR	14	118
Dhurakij Pundit University	Thailand	23	NR	17	550
Aligarh Muslim University	India	23	NR	23	1555
UCSI University	Malaysia	22	NR	19	218
Politecnico di Torino	Italy	22	NR	12	521
Jiangsu University	China	21	NR	21	380
Universidad de La Laguna	Spain	20	NR	20	333
Universitas Negeri Padang	Indonesia	18	NR	9	17
Universiti Malaysia Kelantan	Malaysia	18	NR	17	291
Multimedia University	Malaysia	18	NR	13	99
Stanford University	United States	18	NR	18	346

Sources: Author's own work

Table 8 illustrates the productivity distribution of authors in the field of entrepreneurship education and student entrepreneurial intentions. The data reveals a highly skewed authorship pattern, consistent with Lotka's Law, which posits that most authors publish only a single paper, while a small minority contributes extensively. Out of 4,301 unique authors, 3,731 authors (86.75%) have authored only one publication, aligning closely with the theoretical expectation of 60% proposed by Lotka. This substantial concentration reflects a field with many occasional contributors or early-stage researchers. In contrast, only a small number of authors exhibit sustained productivity: 404 authors (9.39%) wrote two documents, while fewer than 1% of authors contributed to five or more publications. The tail of the distribution includes a few exceptionally prolific authors, such as two individuals with 15 publications, underscoring the existence of core intellectual leaders.

Table 8: Productivity Patterns of Authors and Research Contributions

Document Written	N. of Authors	Proportion of Authors	Lotka's Law
1	3731	86.75%	60.00%
2	404	9.39%	15.00%
3	94	2.19%	6.67%
4	38	0.88%	3.75%
5	17	0.40%	2.40%
6	6	0.14%	1.67%
7	1	0.02%	1.22%
8	4	0.09%	0.94%
9	3	0.07%	0.74%
13	1	0.02%	0.36%
15	2	0.05%	0.27%
Grand Total	4301	100.00%	93.01%

3.4 Country-Level Research Contributions

Table 9 shows that China leads the field in total research output (TP = 489), followed by Malaysia (TP = 423) and Indonesia (TP = 351), indicating a strong regional emphasis on entrepreneurship education in Asia. However, the United States, despite ranking sixth in volume (TP = 191), dominates in total citations (TC = 25,488) and citation impact (C/P = 133.45), reflecting the highest research influence per publication. Spain and the United Kingdom also demonstrate strong performance in citation metrics, with Spain achieving a high h-index (47) and substantial total citations (TC = 11,507). In contrast, developing economies such as Peru, Bangladesh, and Nigeria contribute fewer papers but show

growing engagement, evidenced by moderate citation averages (e.g., Bangladesh C/CP = 25.24).

Table 9: Most Productive Countries

Country	TP	NCA	NCP	TC	C/P	C/CP	h	g	m
China	489	11	426	12476	25.51	29.29	62	111	3.444
Malaysia	423	11	348	5933	14.03	17.05	42	77	2.471
Indonesia	351	51	261	2710	7.72	10.38	25	52	2.083
Spain	348	2	328	11507	33.07	35.08	47	107	2.611
India	261	NR	202	3967	15.20	19.64	30	62	1.875
United States	191	24	176	25488	133.45	144.82	49	159	2.333
Portugal	190	2	160	4000	21.05	25.00	38	63	2.111
Viet Nam	169	NR	123	2577	15.25	20.95	24	50	3.429
United Kingdom	157	9	135	9733	61.99	72.10	43	98	1.870
Pakistan	115	2	104	2911	25.31	27.99	28	53	1.647
South Africa	107	NR	88	1238	11.57	14.07	14	35	1.077
Romania	106	5	100	3655	34.48	36.55	26	60	1.444
Italy	104	6	86	2657	25.55	30.90	26	51	2.364
Saudi Arabia	103	5	83	1879	18.24	22.64	25	43	2.273
Brazil	101	NR	84	1602	15.86	19.07	24	40	1.846
Greece	101	NR	86	2160	21.39	25.12	16	46	0.941
Peru	99	NR	47	706	7.13	15.02	11	26	2.200
Colombia	95	NR	85	1522	16.02	17.91	20	39	1.333
Thailand	94	NR	63	906	9.64	14.38	16	30	2.000
Nigeria	81	NR	59	1016	12.54	17.22	20	31	1.667
Taiwan	74	2	72	2096	28.32	29.11	25	45	1.667
Mexico	71	NR	52	392	5.52	7.54	9	19	0.750
Bangladesh	67	3	45	1136	16.96	25.24	16	33	1.455
Chile	61	NR	37	770	12.62	20.81	19	27	1.462
Germany	51	NR	45	1817	35.63	40.38	21	42	0.955

Note: TP=total number of publications; NCA=number of contribution authors; NCP=number of cited publications; TC=total citations; C/P=average citations per publication; C/CP=average citations per cited publication; h=h-index; g=g-index, m=m-index.

Table 10 presents the distribution of contributing authors across institutions by country. Indonesia leads with the highest number of contributing authors (NCA = 51). The United States ranks second (NCA = 24), consistent with its dominance in citation metrics, while Jordan shows a surprisingly strong presence with 16 contributing authors, surpassing countries like China (NCA = 11) and Malaysia (NCA = 11). English-speaking nations such as Australia (NCA = 10) and the United Kingdom (NCA = 9) also maintain a solid footprint. European and Asian representation is diverse, with contributions from Turkey, Italy, Saudi Arabia, and South Korea, each ranging from 4 to 7 authors. Countries with fewer authors, such as Belgium, Spain, and Portugal (NCA ≤ 2), still play important niche roles in the global research landscape.

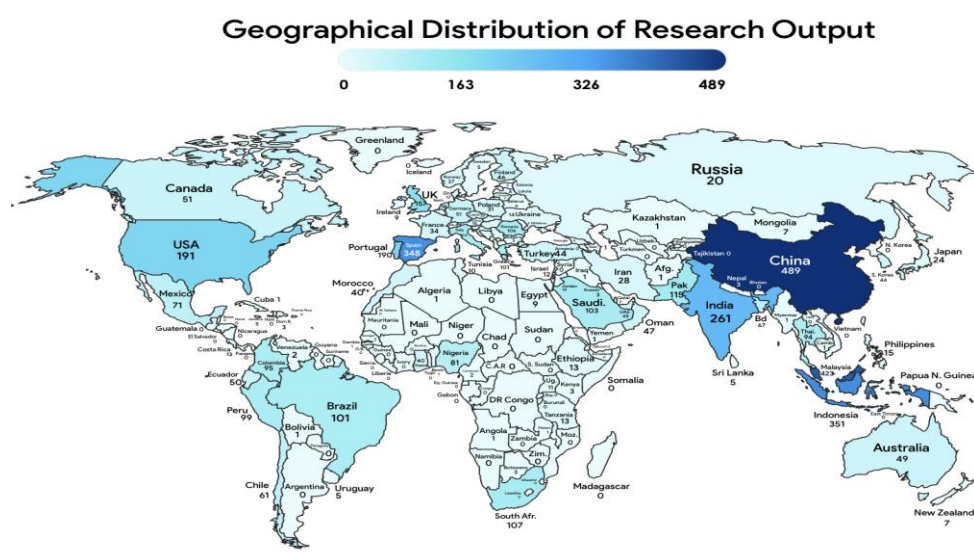
Figure 6 visualizes the global distribution of research output in entrepreneurship education and student entrepreneurial intentions. China emerges as the leading contributor with 489 publications, followed by India (261), Indonesia (351), and Spain (348), marking a strong presence from both Asian and European regions. The United

States also holds a significant position with 191 publications, demonstrating its continued influence despite a relatively lower total output compared to China. Southeast Asian countries such as Malaysia (423) and Vietnam (169) also exhibit high research activity, reflecting regional academic engagement. European contributors such as Portugal (190), the United Kingdom (157), and Germany (51) show moderate but impactful participation. Notably, countries from Latin America (e.g., Brazil and Mexico), the Middle East (e.g., Saudi Arabia), and Africa (e.g., Nigeria and South Africa) are represented but at comparatively lower output levels.

Table 10: Number of contribution authors

Institutions	NCA
Indonesia	51
United States	24
Jordan	16
China	11
Malaysia	11
Australia	10
United Kingdom	9
Turkey	7
Italy	6
Saudi Arabia	5
Romania	5
South Korea	4
New Zealand	4
Latvia	3
Bangladesh	3
Portugal	2
Taiwan	2
Russian Federation	2
Bahrain	2
Pakistan	2
Spain	2
Belgium	1

Figure 6: Geographical Distribution of Research Output



Sources: Author's own work

3.5 Keyword Co-occurrence and Citation Impact Analysis

Table 12 identifies the most influential author keywords in the domain of entrepreneurship education and student entrepreneurial intention. "Entrepreneurial Intention" and "Entrepreneurship Education" are the most frequently used keywords, appearing in 861 and 624 documents respectively, with high citation counts, confirming their centrality in the field. Notably, "Higher Education", "Theory of Planned Behaviour", and "Entrepreneurial Self-Efficacy" are also prevalent. In terms of impact, "Personality Traits" stands out with the highest average citation per document (95.84), indicating that while less frequently used, it contributes disproportionately to high-impact studies. Other highly cited terms include "Intention", "Gender", "Self-Efficacy", and "Subjective Norms", all averaging over 35 citations per document. The presence of keywords such as "University Students", "Students", and "Motivation" affirms the focus on youth and educational settings. Meanwhile, emerging themes such as "Entrepreneurial Passion" and "Student Entrepreneurship" point to evolving interests in affective dimensions and practical engagement in entrepreneurship among students.

Table 11: High-impact Author Keywords

Keyword	Documents	Citations	Avg. citations
Entrepreneurial Intention	861	22143	25.71777003
Entrepreneurship Education	624	16926	27.125
Higher Education	331	9401	28.40181269
Theory Of Planned Behaviour	196	5368	27.3877551
Education	146	2506	17.16438356
Entrepreneurial Self-Efficacy	98	3137	32.01020408
Intention	85	4337	51.02352941
Self-Efficacy	80	2949	36.8625
Gender	76	3249	42.75
Entrepreneurial Behavior	74	2690	36.35
University Students	68	1571	23.10294118
Subjective Norms	65	2412	37.10769231
Students	64	1352	21.125
University	42	1437	34.21428571
Attitude	34	408	12
Personality Traits	31	2971	95.83870968
Student Entrepreneurship	29	1137	39.20689655
Entrepreneurial Passion	28	785	28.03571429
Motivation	28	696	24.85714286

Sources: Author's own work

Table 12: High-impact Author Keywords

Keyword	Documents	Citations	Avg. citations
Entrepreneurial Intention	861	22143	25.71777003
Entrepreneurship Education	624	16926	27.125
Higher Education	331	9401	28.40181269
Theory Of Planned Behaviour	196	5368	27.3877551
Education	146	2506	17.16438356
Entrepreneurial Self-Efficacy	98	3137	32.01020408
Intention	85	4337	51.02352941
Self-Efficacy	80	2949	36.8625
Gender	76	3249	42.75

Entrepreneurial Behavior	74	2690	36.35
University Students	68	1571	23.10294118
Subjective Norms	65	2412	37.10769231
Students	64	1352	21.125
University	42	1437	34.21428571
Attitude	34	408	12
Personality Traits	31	2971	95.83870968
Student Entrepreneurship	29	1137	39.20689655
Entrepreneurial Passion	28	785	28.03571429
Motivation	28	696	24.85714286

Sources: Author's own work

4. Discussion

Based on the Scopus dataset and scientometric results, the intellectual structure of entrepreneurship education and student entrepreneurial intentions reveals a highly institutionalized and globally distributed research landscape, anchored by influential scholars, institutions, and publication venues.

4.1 Key Contributors in the Field

The growth of scholarship in this domain reflects not just an increase in volume but also the crystallization of thought leadership through a network of prolific authors, institutions, and journals. While many scholars contribute to the field, a smaller group of high-impact authors has shaped its theoretical and empirical core. Scholars like Liñán Francisco, who boasts an exceptionally high citation count (2,352) and h-index (8) from just eight publications, illustrate the power of seminal contributions that refine or operationalize key constructs such as entrepreneurial intention and self-efficacy. Liñán's influential work on cognitive antecedents and the role of perception in entrepreneurial decision-making has become foundational (e.g., Liñán, 2008; Nabi et al., 2017). Other authors, such as Duong Cong Doanh (Vietnam) and Narmaditya Bagus Shandy (Indonesia), represent rising voices from emerging economies, indicating the globalization of entrepreneurship education discourse. Notably, their h- and g-indices are growing rapidly, signaling ongoing engagement with context-specific challenges and pedagogies. The co-authorship structure also reflects a strong tendency toward collaborative scholarship, especially in Southeast Asia and Southern Europe, often driven by university-led entrepreneurship policy reforms. As reflected in Lotka's distribution (Table 8, Result.docx), over 86% of authors published only one paper, but the concentration of influence is heavily skewed toward a minority who repeatedly publish in top-tier journals.

Institutions such as the National Economics University (Vietnam) and Universitas Negeri Malang (Indonesia) are among the most prolific, reflecting a regional shift toward Asia as a growing hub of entrepreneurship education research. These universities, alongside the University of West Attica (Greece) and Seinäjoki University of Applied Sciences (Finland), demonstrate an increasing commitment to practice-based education models and regional development strategies. Interestingly, Chinese institutions such as Wenzhou Medical University and Jiangsu University also appear prominently, but with higher citation-per-paper ratios. This suggests that although Chinese authors are less numerous than their Southeast Asian counterparts, their outputs often gain more global traction, possibly due to broader collaboration networks and methodological rigor.

From a dissemination perspective, *Frontiers in Psychology*, *Sustainability* (Switzerland), and *Entrepreneurship: Theory and Practice* emerge as pivotal sources. Their high citation-per-paper ratios and h-index values indicate both reach and relevance. Journals like *Entrepreneurship: Theory and Practice* serve as both incubators for theoretical advancement (e.g., Theory of Planned Behavior adaptations) and practical inquiry, contributing to the policy and pedagogical dimensions of entrepreneurship education. The prominence of interdisciplinary journals (e.g., *Computers in Human Behavior*, *Technological Forecasting and Social Change*) underscores the hybrid nature of the field, wherein psychological, educational, and managerial lenses intersect. These outlets also reflect a growing trend of integrating data-driven methodologies such as PLS-SEM, fsQCA, and structural equation modeling in entrepreneurship research.

This author–institution–source triad reveals a maturing academic field that is both globally inclusive and methodologically diverse. However, it also highlights disparities in impact versus productivity. While Asian institutions contribute the highest volume of publications, Western scholars such as Liñán, Nabi, and Wilson continue to dominate citation metrics. This asymmetry invites a deeper inquiry into how contextual factors (e.g., institutional support, language barriers, and journal access) influence the dissemination and reception of knowledge across regions.

4.2 Thematic Core and Conceptual Structure of the Field

The intellectual terrain of entrepreneurship education and entrepreneurial intention research is shaped by an evolving cluster of themes centered around cognition, education, self-efficacy, and socio-cultural context.

At the heart of the field lies the cognitive–behavioral tradition, where Entrepreneurial Intention (861 documents; 22,143 citations) and Entrepreneurship Education (624 documents; 16,926 citations) dominate both in volume and influence. The Theory of Planned Behaviour (TPB) is a foundational backbone, frequently operationalized through constructs like attitude, subjective norms, and perceived behavioral control (Ajzen, 1991; cited across studies such as Liñán, 2008; Karimi et al., 2016). Studies such as Nabi et al. (2017) and Bae et al. (2014) systematically reinforce this theoretical anchoring, emphasizing that entrepreneurial intentions are not only shaped by personal dispositions but also by education-induced cognitive recalibration. The high citation rate of intention-related keywords (e.g., "Self-Efficacy" = 2949 citations; "Intention" = 4337 citations) suggests sustained academic confidence in TPB-based models.

The second major cluster centers on entrepreneurial self-efficacy, motivation, and passion, indicating a shift from purely cognitive constructs to more affective-emotional drivers. Scholars like Wilson et al. (2007) and McGee et al. (2009) refine the measurement of self-efficacy, demonstrating how beliefs about one's competence predict entrepreneurial behavior and resilience. The keyword Personality Traits shows an exceptional citation-to-document ratio (95.8), reinforcing the increasing emphasis on psychological profiling and the role of stable individual differences (e.g., proactiveness, locus of control) in entrepreneurial intention formation. This is particularly relevant in cross-cultural contexts where personality factors may interact with social norms and educational experiences differently. The significant attention being paid to "personality traits" may suggest that the educational community is recognizing that simply teaching business skills (such as business plans and market analysis) is insufficient for cultivating successful entrepreneurs. The entrepreneurial journey is fraught with uncertainty and

challenges, requiring students to possess non-cognitive abilities such as resilience, proactiveness, grit, and a spirit of risk-taking. Consequently, researchers and educators are shifting their focus from "how to start a business" to "who is suited to entrepreneurship" and "how to cultivate entrepreneurs' non-cognitive abilities." This signals a shift in entrepreneurship education from a traditional skills-based approach to a more comprehensive, student-centered model of personal development.

Higher Education (331 documents; 9401 citations) emerges not merely as a setting but as a mechanism of entrepreneurial socialization. Research, including Oosterbeek et al. (2010) and Piperopoulos & Dimov (2015), investigates how the design, delivery, and experiential depth of entrepreneurship curricula influence students' perceived feasibility and desirability of entrepreneurship. This theme connects with pedagogical innovations such as experiential learning, design thinking, and competency-based education, which are gaining prominence in recent years. The high co-occurrence of terms like "Students," "University Students," and "Creativity" illustrates a growing interest in understanding how youth-centric learning environments shape entrepreneurial mindsets.

Newer topics such as entrepreneurial mindset, digital entrepreneurship, and sustainable entrepreneurship are gaining traction, especially in publications post-2020. The COVID-19 pandemic and global sustainability agenda have accelerated interest in entrepreneurship as a tool for resilience and social change (Jena, 2020; Nabi et al., 2018). Country-specific keywords (e.g., "Malaysia," "India," "Saudi Arabia") also reflect an increasing contextualization of research, particularly in Global South nations where entrepreneurship is tied to employment generation and informal economies. The study notes the high output of entrepreneurship education research in Asian countries such as China and Malaysia, highlighting the crucial importance of a deeper understanding of its pedagogical significance. This is likely related to the common challenges these countries face (such as rising youth unemployment) and government-led education strategies. Many Asian countries have formally incorporated entrepreneurship education into their national education strategies, viewing it as a policy tool for addressing socioeconomic challenges, promoting economic diversification, and encouraging innovation. Therefore, academic research output is not simply driven by academic interest; it is also driven by national policy initiatives, providing empirical support and theoretical frameworks for policymakers. This suggests that in these countries, entrepreneurship education is not simply a component of university curricula but a strategic discipline with significant social and economic implications.

Thematic evolution in this field underscores a methodological tension between generalizable, universal theories (e.g., TPB) and context-sensitive explorations. While TPB remains dominant, critics argue that it underestimates institutional and ecological factors (Fayolle & Liñán, 2014).

4.3 Emerging Trajectories in Entrepreneurship Education and Student Entrepreneurial Intentions

The evolution of research in entrepreneurship education and entrepreneurial intention has demonstrated increasing diversification in both methodological approaches and thematic focus. A prominent trend is the integration of digital technologies and platforms in entrepreneurship pedagogy. Keywords such as Digital Entrepreneurship, PLS-SEM, fsQCA, and Structural Equation Modeling reflect a growing emphasis on both

digital entrepreneurial contexts and advanced analytical tools used to explore entrepreneurial behavior. The increasing frequency of Engineering Students and Digital Entrepreneurial Intention indicates a shift toward cross-disciplinary integration, especially between technology and business education, aimed at nurturing tech-savvy entrepreneurs. This trend aligns with recent literature advocating experiential and platform-based learning models (e.g., Duong et al., 2022; Zhang et al., 2023).

Another emergent theme is Sustainable Entrepreneurship, Green Entrepreneurship Intention, and Social Entrepreneurship, revealing a growing focus on environmental and social responsibility. Such orientations signal a shift from purely profit-driven entrepreneurial intentions toward value-driven entrepreneurship, particularly among university students in regions such as Malaysia, India, and South Africa. The emergence of these keywords is supported by literature underscoring the importance of sustainability education in fostering long-term entrepreneurial behavior (e.g., Nabi et al., 2017; Maresch et al., 2016).

High-impact keywords like Gender, Personality Traits, Self-Efficacy, and Entrepreneurial Passion suggest deepening exploration of personal and cognitive antecedents of entrepreneurial intention. These findings are further corroborated by seminal works such as Wilson et al. (2007) and McGee et al. (2009), which highlight gender-specific barriers and the role of entrepreneurial self-efficacy as a mediating factor. The renewed attention to psychological constructs also reflects the influence of the Theory of Planned Behavior and Social Cognitive Career Theory.

Recent literature also emphasizes the role of Entrepreneurial University, University Support, and Entrepreneurial Ecosystem as enabling environments. The integration of entrepreneurship education within institutional frameworks fosters long-term impact through curriculum reforms, startup incubation, and policy alignment. Studies such as Nowiński et al. (2019) and Franke & Lüthje (2004) provide evidence that institutional context significantly moderates the development of entrepreneurial intention, especially in developing and transition economies.

5. Conclusion

This scientometric analysis maps the intellectual structure of research on entrepreneurship education and student entrepreneurial intentions, revealing critical insights into its evolution, key contributors, thematic foci, and future directions. The field has undergone three major developmental phases—from sporadic early inquiry (1997–2007), through theoretical consolidation (2008–2014), to a phase of rapid expansion and institutionalization (2015–2025), with notable growth in both publication volume and citation impact.

Prominent authors such as Francisco Liñán and institutions including the National Economics University (Vietnam) and Universitas Negeri Malang (Indonesia) emerged as intellectual anchors, while *Frontiers in Psychology* and *Sustainability* (Switzerland) dominated scholarly dissemination. High-impact studies often revolve around the Theory of Planned Behaviour (Ajzen, 1991) and self-efficacy frameworks (Bandura, 1997), underpinning the theoretical robustness of the domain.

Keyword co-occurrence and citation patterns suggest enduring emphasis on constructs like entrepreneurial self-efficacy, gender, motivation, and higher education, while recent

shifts signal rising interest in digital entrepreneurship, sustainability, and cross-cultural pedagogies. Notably, countries in Asia and Southern Europe are emerging as significant contributors, indicating a global diversification of research leadership.

Looking ahead, future scholarship is likely to deepen in complexity—embracing intersectional themes (e.g., sustainability and inclusivity), methodological pluralism (e.g., PLS-SEM, fsQCA), and practice-based research responsive to dynamic educational and economic ecosystems.

Ethics Approval and Consent to Participate

Ethical approval for this study was obtained from the Research Ethics Committee of Universiti Kebangsaan Malaysia (RECUKM), with the Ethical Reference Number JEP-2026-806. All procedures involving human participants were conducted in accordance with the ethical standards of the institutional research committee and the principles of the Declaration of Helsinki. Informed consent was obtained from all participants prior to their participation in the study.

Acknowledgement

Part of this article was extracted from a doctoral thesis submitted to Universiti Kebangsaan Malaysia (UKM), Malaysia.

Funding

This study received no external funding.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the research, authorship, or publication of this article.

References

- Bae, T. J., Qian, S., Miao, C., & Fiet, J. O. (2014). The relationship between entrepreneurship education and entrepreneurial intentions: A meta-analytic review. *Entrepreneurship: Theory and Practice*, 38(2), 217–254. <https://doi.org/10.1111/etap.12095>
- Bolton, D. L., & Lane, M. D. (2012). Individual entrepreneurial orientation: Development of a measurement instrument. *Education + Training*, 54(2/3), 219–233. <https://doi.org/10.1108/00400911211210314>
- Chen, L., Hu, Y., & Liu, M. (2023). Exploring entrepreneurial self-identity among university students: A machine learning analysis. *Journal of Entrepreneurship Education*, 26(3), 112–134.
- Franke, N., & Lüthje, C. (2004). Entrepreneurial intentions of business students – A benchmarking study. *International Journal of Innovation and Technology Management*, 1(3), 269–288. <https://doi.org/10.1142/S0219877004000209>

- Hassan, A., Awan, S. H., & Anwar, I. (2022). Psychological determinants of entrepreneurial intention: A meta-analytic structural equation modeling approach. *Studies in Higher Education*, 47(5), 983–1002.
- Imran, S., Khan, R. U., & Batool, A. (2025). Resilience and entrepreneurial intention: A moderated mediation model among university students. *Entrepreneurship Research Journal*, 15(1), 67–89.
- Jena, R. K. (2020). Measuring the impact of business management students' attitude towards entrepreneurship education on entrepreneurial intention: A case study. *Computers in Human Behavior*, 107, 106275. <https://doi.org/10.1016/j.chb.2020.106275>
- Karimi, S., Biemans, H. J. A., Lans, T., Chizari, M., & Mulder, M. (2016). The impact of entrepreneurship education: A study of Iranian students' entrepreneurial intentions and opportunity identification. *Journal of Small Business Management*, 54(1), 187–209. <https://doi.org/10.1111/jsbm.12137>
- Karimi, S., Biemans, H. J., & Lans, T. (2023). Linking entrepreneurial competencies to student career orientation in engineering education. *Technological Forecasting and Social Change*, 189, 122374.
- Kolvereid, L., & Moen, Ø. (1997). Entrepreneurship among business graduates: Does a major in entrepreneurship make a difference? *Journal of European Industrial Training*, 21(4), 154–160. <https://doi.org/10.1108/03090599710171404>
- Liñán, F. (2008). Skill and value perceptions: How do they affect entrepreneurial intentions? *International Entrepreneurship and Management Journal*, 4(3), 257–272. <https://doi.org/10.1007/s11365-008-0093-0>
- Maresch, D., Harms, R., Kailer, N., & Wimmer-Wurm, B. (2016). The impact of entrepreneurship education on the entrepreneurial intention of students in science and engineering versus business studies university programs. *Technological Forecasting and Social Change*, 104, 172–179. <https://doi.org/10.1016/j.techfore.2015.11.006>
- McGee, J. E., Peterson, M., Mueller, S. L., & Sequeira, J. M. (2009). Entrepreneurial self-efficacy: Refining the measure. *Entrepreneurship: Theory and Practice*, 33(4), 965–988. <https://doi.org/10.1111/j.1540-6520.2009.00304.x>
- Nabi, G., Liñán, F., Fayolle, A., Krueger, N., & Walmsley, A. (2017). The impact of entrepreneurship education in higher education: A systematic review and research agenda. *Academy of Management Learning & Education*, 16(2), 277–299. <https://doi.org/10.5465/amle.2015.0026>
- Nabi, G., Walmsley, A., Liñán, F., Akhtar, I., & Neame, C. (2018). Does entrepreneurship education in the first year of higher education develop entrepreneurial intentions? The role of learning and inspiration. *Studies in Higher Education*, 43(3), 452–467. <https://doi.org/10.1080/03075079.2016.1177716>
- Nguyen, T. H., Tran, Q. T., & Pham, M. N. (2022). Passion-driven entrepreneurship education: A study of university students in Vietnam. *Education + Training*, 64(6), 759–777.
- Nowiński, W., Haddoud, M. Y., Lančarič, D., Egerová, D., & Czeglédi, C. (2019). The impact of entrepreneurship education, entrepreneurial self-efficacy and gender on entrepreneurial intentions of university students in the Visegrad countries. *Studies in Higher Education*, 44(2), 361–379. <https://doi.org/10.1080/03075079.2017.1365359>
- Oosterbeek, H., van Praag, M., & Ijsselstein, A. (2010). The impact of entrepreneurship education on entrepreneurship skills and motivation. *European Economic Review*, 54(3), 442–454. <https://doi.org/10.1016/j.euroecorev.2009.08.002>

- Piperopoulos, P., & Dimov, D. (2015). Burst bubbles or build steam? Entrepreneurship education, entrepreneurial self-efficacy, and entrepreneurial intentions. *Journal of Small Business Management*, 53(4), 970–985. <https://doi.org/10.1111/jsbm.12116>
- Pruett, M., Shinnar, R., Toney, B., Llopis, F., & Fox, J. (2009). Explaining entrepreneurial intentions of university students: A cross-cultural study. *International Journal of Entrepreneurial Behavior & Research*, 15(6), 571–594. <https://doi.org/10.1108/13552550910995443>
- Sánchez, J. C. (2011). University training for entrepreneurial competencies: Its impact on intention of venture creation. *International Entrepreneurship and Management Journal*, 7(2), 239–254. <https://doi.org/10.1007/s11365-010-0156-x>
- Wang, Y., & Zhang, F. (2024). Entrepreneurial education and social entrepreneurial intention: Evidence from Chinese undergraduates. *Sustainability*, 16(2), 944.
- Wilson, F., Kickul, J., & Marlino, D. (2007). Gender, entrepreneurial self-efficacy, and entrepreneurial career intentions: Implications for entrepreneurship education. *Entrepreneurship: Theory and Practice*, 31(3), 387–406. <https://doi.org/10.1111/j.1540-6520.2007.00179.x>
- Wu, S., & Wu, L. (2008). The impact of higher education on entrepreneurial intentions of university students in China. *Journal of Small Business and Enterprise Development*, 15(4), 752–774. <https://doi.org/10.1108/14626000810917843>
- Zhang, Y., Duysters, G., & Cloudt, M. (2014). The role of entrepreneurship education as a predictor of university students' entrepreneurial intention. *International Entrepreneurship and Management Journal*, 10(3), 623–641. <https://doi.org/10.1007/s11365-012-0246-z>
- Zhao, H., Seibert, S. E., & Hills, G. E. (2005). The mediating role of self-efficacy in the development of entrepreneurial intentions. *Journal of Applied Psychology*, 90(6), 1265–1272. <https://doi.org/10.1037/0021-9010.90.6.1265>