

Entrepreneurial Intention in High School: Systematic Literature Review of the Period 2000–2022

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Abstract

Researchers have devoted little attention to exploring entrepreneurial intention (EI) in high school education. The lack of academic papers that seek to analyze the state of academic production of EI in high school education opens a gap in the academic literature. This study aims to analyze the academic production of EI in high school in the period 2000–2022, adopting the systematic literature review. The study is descriptive, quantitative and exploratory in nature, using the Scopus, Web of Science and ERIC databases and the Bibliometrix tool. After using the screening protocol 33 articles were selected for analysis. One of the main findings of the study is the mapping of four thematic lines: a) testing conceptual model of EI; b) influence of different factors on the EI of high school students; c) EI can be studied using different constructs; d) validation of the EI questionnaire. The findings are innovative and contribute to filling a gap in the academic literature. The results have many practical implications. For example: a) high school principals, coordinators and teachers can use the results to stimulate reflection on the centrality of the student in the teaching and learning processes, aiming to develop entrepreneurial competencies and skills; b) thematic lines could help in building a research agenda with several research avenues.

Keywords: Academic production, Entrepreneurial intention, Entrepreneurship, High School.

1. Introduction

Entrepreneurship has aroused the interest of researchers and practitioners in recent decades (Filion & Lima, 2010). The several changes that have been taking place in the social, economic, political, technological, demographic and cultural context have pressured on the high education students. This tension in high school education requires students to acquire new skills and profiles related to the field of entrepreneurship, including entrepreneurial skills and entrepreneurial abilities (Rothaermel et al., 2007; Martens & Freitas, 2008; Ruiz & Martens, 2019; Santos et al., 2021).

In this line of thought, one of the areas addressed in the field of entrepreneurship is Entrepreneurial Intention (EI) connected and related to high school education. According to Krueger and Brazeal (1994) EI is based on the interaction between personal characteristics, perceptions, values, beliefs, socio-demographic and even environmental variables. EI is an individual's mental state that directs their efforts toward starting a new business. Krueger, Reilly and Carsrud (2000) point out that the decision to become an entrepreneur with a focus on starting a new business is voluntary, conscious and a planned decision. Therefore, EI can be predicted and understood by analysis models. The study developed by Kautonen, Gelderen and Fink (2015) also confirmed that EI can predict entrepreneurial action. One of the investigations is based on Fayolle and Liñán (2014) who consider EI to be a vibrant field in entrepreneurship research, i.e. a field open to innovation. In this sense, it is essential to analyze EI in high school education.

However, researchers have been devoting attention to investigating EI in undergraduate and graduate programs. The investigation of EI in high school education has been placed on the second level. For example, Aure et al (2019) seek empirical evidence of the factors that determine EI in higher education from a cognitive perspective. Another author is Nowinski et al. (2019) who investigates the contributions of entrepreneurship education to the EI of university students in the Visegrad countries (Czech Republic, Hungary, Poland and Slovakia). There are few academic articles on EI in high school education. This limited number of academic articles on EI in high school education indicates a gap in the international academic literature.

Why investigate EI in high school? First, there are no academic articles of Systematic Literature Review (SLR) of EI in high school education in the international academic literature. The lack of SLR articles restricts the knowledge about the state of academic production of EI in high school. Second, high school is a bridge to higher education. High school students need to reach higher education with entrepreneurial skills. Therefore, it is important to broaden the understanding of connections, interfaces and relationships between EI and high school education. Third, Brazilian basic document for high school, entitled 'the Common National Curriculum Base (CNCB) states that schools aimed at young people should 'provide a culture favorable to the development of attitudes, skills and values that promote entrepreneurship' (Brazil, 2018, p. 466). In this argument line, it is necessary to expand investigations to understand the connections and interfaces between EI in high school education. Analysis and understanding of the academic papers of EI in high school education is crucial to point out different possible paths and avenues of investigation.

This study aims to answer the following basic question: What is the state of academic production of IE in high school education? The aim of this work is to analyze the academic production of EI in high school education from 2000 to 2022. To achieve the established objective, 33 articles indexed from the Scopus, Web of Science and ERIC databases were selected for analysis. The findings of the study are innovative and contribute to filling the gap in the literature. The lack of academic papers that seek to analyze the state of academic production of EI in high school education opens a gap in the academic literature. The results of this research broaden the understanding and knowledge of EI in high school education and foster the study of interfaces and connections.

The article is structured into five sections. The first section presents the introduction with research motivation, basic question and objective. The second section presents the method and technique. The third section is dedicated to the results and discussions. The fourth section presents innovative contributions and practical implications. Final considerations are presented in section 5.

2. Method

The research was conducted following the Systematic Literature Review (SLR) (Booth et al., 2016; Xiao & Watson, 2017). The SLR is based on three criteria: clarity, validity and auditability. Clarity means that the research is presented in a way that allows it to be easily understood and interpreted. Furthermore, it is necessary to validate which possible biases can be avoided in the literature review. After all, the transparency and correct presentation of the data guarantees the auditability of the SLR. Table 1 presents the steps and typology of the research proposed by Xiao and Watson (2017) which, consists of 8 steps.

Table 1. Steps description

Steps	Description	Session	
1	Problem formulation	Formulation of the main research question.	1
2	Review of the development and validation protocol.	Elaboration of the research plan specifying all elements of the review (purpose of study, main question, strategies adopted, data analysis and evaluation, synthesis and documentation of results).	2
3	Literature review	Definition of the strategy and scope of the literature search (electronic database, retrospective or progressive search).	2
4	Screening for inclusion	Decision making for inclusion or not of the articles raised in the SLR.	3
5	Assessment of quality	In-depth assessment of articles that have passed the previous step.	3
6	Data extraction	Coding and extraction of relevant topics throughout the body of the article.	4
7	Data analysis and summary	Organization of data in tables, charts and graphs to facilitate visualization and interpretation of results.	4
8	Documentation of results	Sufficiently detailed documentation of the activities carried out and the results found by the SLR, for a clear and accurate visualization and interpretation of the results.	5

In step 1, the main question was defined and in step 2 strategies for surveying, analyzing and evaluating the articles for the SLR were developed. In step 3, papers were collected from January, 2000 to December, 2022 in the Scopus, Web of Science and ERIC databases. Two surveys of papers were carried out using the following terms:

- 'Entrepreneurial intention' + 'high school'
- 'Entrepreneurial intention' + 'secondary school'

Queries were carried out on the titles, abstracts and keywords of papers in the Scopus, Web of Science and ERIC databases and 60 documents published between 2000 and 2022 were identified. In step 4, articles were screened

based on five criteria. In the first screening criterion, documents of conference papers and book chapters were excluded. Six papers were excluded, totaling 54 papers. In the second screening criterion duplicate articles were excluded. In the third criterion, the articles with the following subject were excluded: the impact of the teachers' creativity in entrepreneurship education programs, effects of entrepreneurship programs and effect of EI variables in different countries. In the fourth criterion, articles with empirical data samples or conceptual analyzes focusing on higher education were excluded. In the fifth criterion, articles linked to EI in high school and secondary school was analyzed in more depth. In the articles on secondary school, analysis of the educational system of the country mentioned in the paper was carried out. The articles were examined in order to find out if the focus is really on high school. The result was 33 articles of EI in high school, 32 from of Scopus data base and 1 from the ERIC data base.

In step 4, the type of article and the central focus were analyzed. In steps 5 and 6 some software was used in the analysis. The bibliometric description and analysis of the publication was carried out using the computer tools Microsoft Excel, RStudio and Bibliometrix. In step 7, considering the number of citations, the 10 articles most citations were listed. Finally, the main results of the SLR and conclusions were registered (step 8).

3. Results and Discussion

The Figure 1 shows the academic production of articles dealing with the EI of high school students.

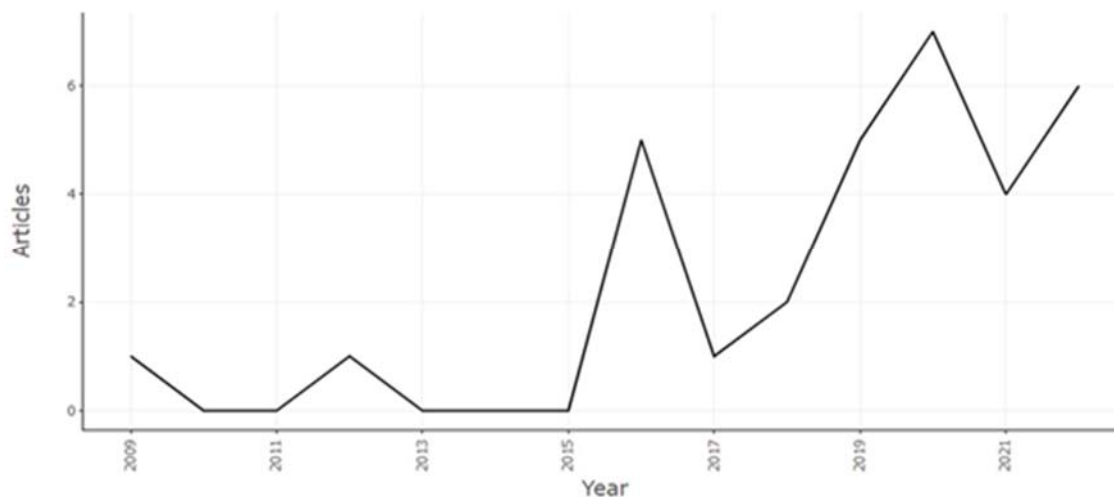


Figure 1. Annual scientific production

Between 2000 and 2008, there weren't publications on EI in high education. From 2009, the publications are few. Publications were distributed by year. Figure 1 suggests that the connection between EI and high education has been fluctuating since 2009. From 2018 the publications attracted the attention of researchers. It is possible to observe a significant increase in the number of articles published about EI in high school education in this period to 2020. An estimated growth of more than 140 percent. Then there was a drop in the number of publications. In the years 2021 and 2022 the numbers increased.

Figure 2 presents the most relevant higher education institutions that the articles authors are affiliated with. Figure 2 shows that affiliations are not concentrated on specific university and suggests that university author is interested in this topic.

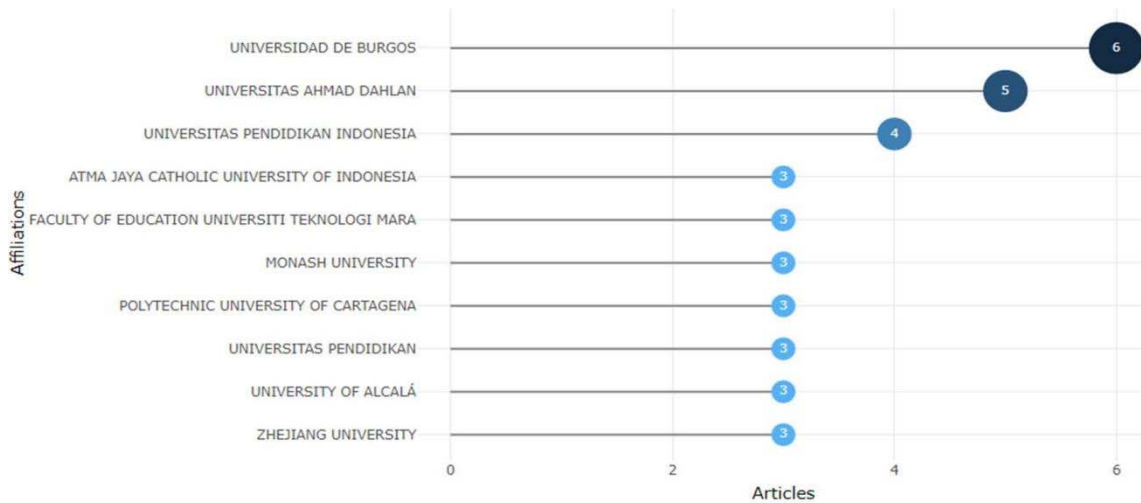


Figure 2. Most relevant affiliations

Table 2 presents the ten most cited articles. The most cited articles deal with two thematic lines. First line is about testing conceptual model of EI. Second line is about the factors that precede EI in high school.

Table 2. Citations

Authors	Year	Citations
Obschonka, M., Hakkarainen, K., Lonka, K., Salmela-Aro, K.	2017	143
Marques, C.S., Ferreira, J.J., Gomes, D.N., Rodrigues, R.G.	2012	105
Shahin, M., Ilic, O., Gonsalvez, C., Whittle	2021	29
Xu, X., Ni, H., Ye, Y.	2016	24
Tentama, F., Abdussalam, F.	2020	18
Mothibi, N.H., Malebana, M.J.	2019	17
Rosique-Blasco, M., Madrid-Guijarro, A., García-Pérez-de-Lema, D.	2016	16
Patuelli, R., Santarelli, E., Tubadji, A.	2020	16
Bux, S., van Vuuren, J.	2019	15
Londono, J.C., Wilson, B., Osorio-Tinoco, F.	2020	14

The article entitled ‘Entrepreneurship as a twenty-first century skill: entrepreneurial alertness and intention in the transition to adulthood’ (Obschonka et al., 2017) considered students’ personality and EI. Obschonka et al. (2017) reveals two aspects. Firstly, leadership skills and self-esteem mediated the relationship between personality and EI. Secondly, creativity and proactivity skills mediated the relationship between personality and entrepreneurial attention.

3.1 Bibliometric Analysis of Results

The computer tools Rstudio version 4.3.3 and Bibliometrix were used for the bibliometric analysis of the results. The surveys obtained from the Scopus, Web of Sciences and ERIC platforms were used for the bibliometric analysis, given the number of 33 publications analyzed. Bibliometrix was used to analyze the keyword co-occurrence network, thematic map, collaboration network, collaboration network density and wordcloud.



Figure 3. Co-occurrence network

The frequency of keyword citations reveals that all behavior in the direction of EI is centralized in the ‘students’ cluster. Figure 4 shows the thematic map and presents the cluster ‘student’ at the center of activities that foster the development of entrepreneurial competencies and skills. Figure 3 shows the cohesion and proximity between EI and high school students.

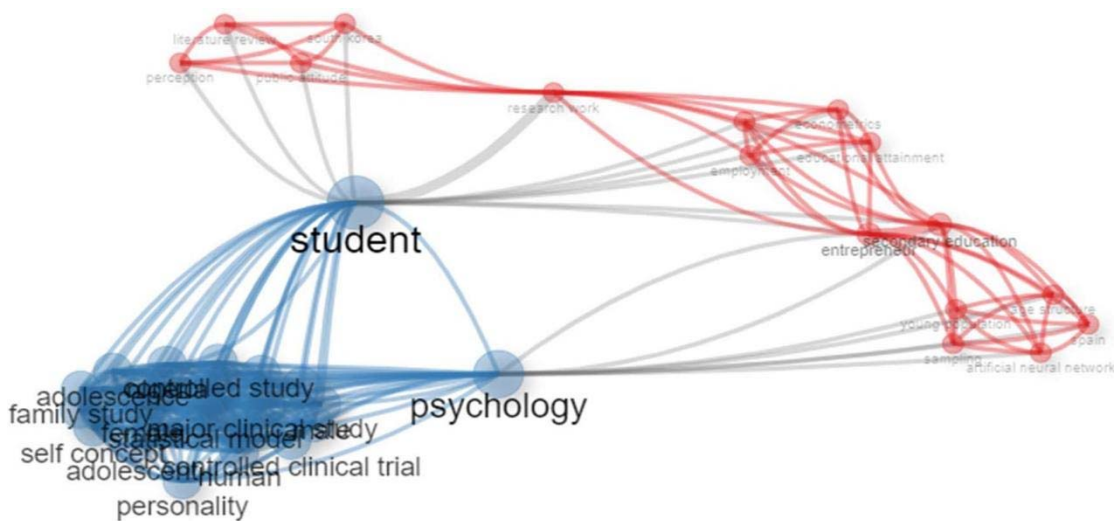


Figure 4. Thematic map



Figure 5. Collaboration network

Figure 5 demonstrates the collaboration network, the density of the proportion of collaborations in relation to the maximum possible number of collaborators.

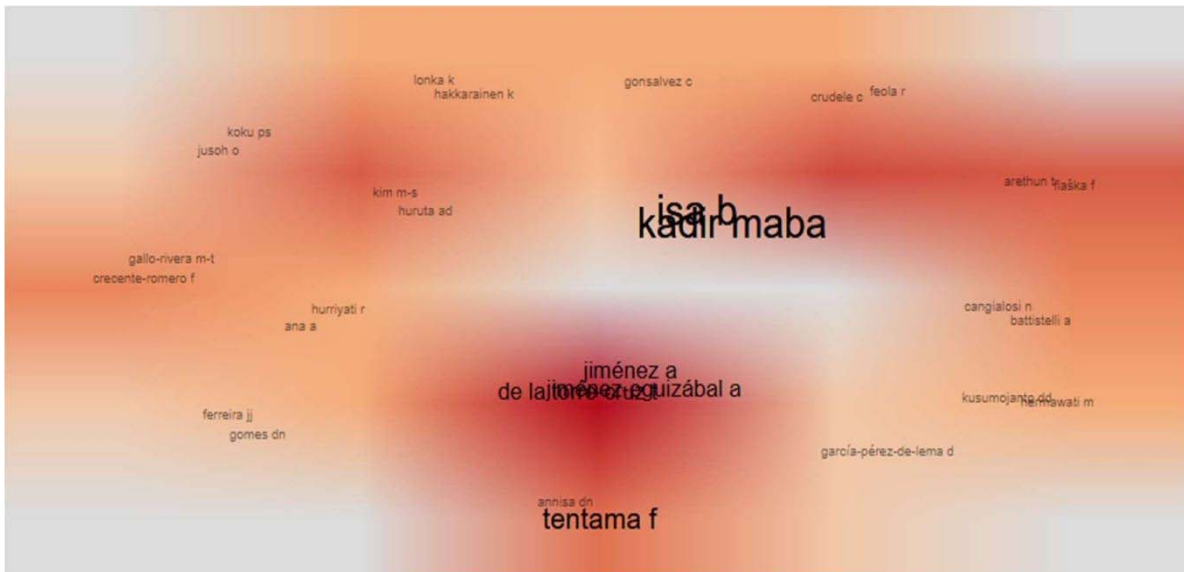


Figure 6. Collaboration network density

Figure 6 shows the high-density cluster with a strong hue. Figure 6 reveals the significant load between the networks of academic productions.

Figure 7 shows the most frequent words in the articles analyzed. This analysis is structured in an image called ‘wordcloud’.

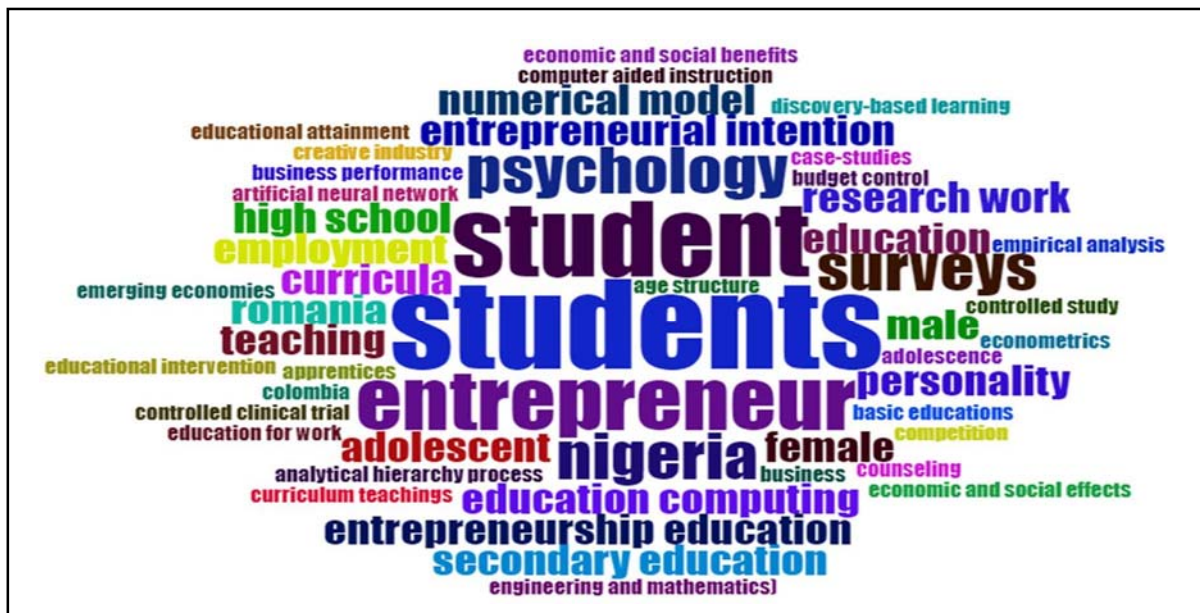


Figure 7. Wordcloud

Figure 7 reveals the words that are connected to each other. This connection reflects the density of the thematic field of this study. The word ‘students’ (central position) expresses the role of the student in the teaching and learning process from the perspective of business education.

3.2 Analysis of Articles on High School Education

The result of the analysis shows 33 articles on the topic EI of high school students. Articles from conferences, book chapters and editorials were excluded. One of the articles presented in the table is a doctoral study in progress, so the results have not been presented.

Table 3. Analysis of articles dealing with students' EI in high school

Author	Title	Goal	Sample	Results	Thematic line	Source
Kim & Huruta (2022)	Predictors of entrepreneurial intention among high school students in South Korea	Assess the connections between perceived entrepreneurial ability, perceived social norm, attitude towards entrepreneurship and entrepreneurial idea.	89 high school students from Korea	Perceived entrepreneurial capacity positively influences entrepreneurial intention. Perceived social norm positively influences entrepreneurial intention, attitude positively influences the relationship to entrepreneurship influences entrepreneurial intention.	Assessment of the connections between constructs perceived entrepreneurial capacity, perceived social norm, and attitude towards entrepreneurship and entrepreneurial intention.	Sustainability (Switzerland) 14(21) pp.14168
Swaramarinda et al. (2022)	Improving The Quality of Youth: Scale Development of Entrepreneurial Intention.	Aims to develop a scale especially for young people in a vocational school context and determine the dimensionality of the items that measure the EI construct.	100 students from 23 vocational high schools.	Four subconstructs of EI were identified with 73.7% of the Total Variance Explained (TVE) and that the instrument is valid and reliable in measuring the items that measure EI.	Determination of the dimensionality of items that measure EI constructs.	Quality - Access to Success 23(191), pp. 143-155
Martínez-Gregorio & Sara (2022)	Measuring entrepreneurship intention in secondary education: validation of the entrepreneurial intention questionnaire.	Validate the Entrepreneurial Intention Questionnaire (EIQ) in secondary school students.	226 Spanish high school students.	Competing models TPB were tested to provide evidence to support that a modified version of the original TPB model is appropriate for secondary education.	Validation of the Entrepreneurial Intention Questionnaire (EIQ) in secondary school students.	Journal of Psychoeducational Assessment 40(4), pp. 499-513
Supardi et al. (2022)	How to educate students to become competent entrepreneurs.	Examine the effect of entrepreneurship education on the entrepreneurial competence of secondary vocational education students.	100 students from 25 public and private vocational high schools in Bandung, Indonesia.	Entrepreneurship education had a significant effect on entrepreneurial intentions; entrepreneurship education had a significant effect on students' entrepreneurial skills, and students' entrepreneurial skills had a significant influence on entrepreneurial intentions.	Impact of entrepreneurship education on entrepreneurial competence and entrepreneurial intention of secondary vocational education students.	Cakrawala Pendidikan 41(1), pp. 142-153
Sutiadiningsih (2022)	Entrepreneurial attitude orientation, social capital, and entrepreneurial intention among vocational students: The mediator role of entrepreneurial self-efficacy.	Evaluating the impact of orientation towards entrepreneurial attitude, social capital and self- efficacy on professional training.	317 students from five public high schools in Surabaya, Indonesia.	Entrepreneurial orientation and self-efficacy impact the entrepreneurial intentions of secondary vocational education students. However, social capital had no impact on students' entrepreneurial inclinations. Furthermore, entrepreneurial self-efficacy influences the impacts of entrepreneurial attitude orientation and social capital on students' entrepreneurial intentions.	Impact of orientation towards entrepreneurial attitude, social capital and self-efficacy on professional training.	Eurasian Journal of Educational Research (101), pp. 16-32.
Vesci et al. (2022)	Exploring the impact of social media on entrepreneurial intention: a survey on high-school students.	Exploring how social media affects students' cognitive processes that lead to the intention to engage in entrepreneurial behavior.	363 high school students in two centers in southern Italy.	Social media addiction plays a significant role in shaping students' entrepreneurial intention social media addiction.	Effect of social media on students' cognitive processes leading to intention to engage in entrepreneurial behavior.	Sinergie 40(3), pp. 175-198
Shahin et al. (2021)	The impact of a STEM-based entrepreneurship program on the entrepreneurial intention of secondary school female students.	Exploring the effects of a STEM-based entrepreneurship program. The Oz Girls (Entrepreneurship Program) is focused on the entrepreneurial intention of female secondary school students.	193 female secondary school students, aged between 14 and 16.	The Oz Girls Entrepreneurship program substantially increased the entrepreneurial intention of female secondary school students.	Effects of an entrepreneurship program focused on the entrepreneurial intention of female secondary school students.	International entrepreneurship and Management Journal 17(4), pp. 1867-1898
Swaramarinda et al. (2021)	Exploring vocational high school students' entrepreneurial intention: preliminary study.	Exploring the entrepreneurial intention of public high school students in entrepreneurship programs in Jakarta, Indonesia.	111 students and 60 former students.	*Doctoral study in progress.	-	International Journal of Learning Teaching and Educational Research 20(6), pp. 341-359
Torres-Ortega & Campos. (2021)	Future entrepreneurial intentions in Chilean and Basque high school students.	Characterize and compare secondary school students from two different countries (personal and family	4.661 Chilean students and 5,767 Basque students.	Chilean students are more inclined to pursue an entrepreneurial career than their Basque peers. Likewise, it is observed that a set of traits that shape	EI characterization of students in two different countries.	CIRIEC-Espana Revista de Economía Publica, social y Cooperativa (103), pp.

		characteristics), relating them to their future entrepreneurial intentions.		an 'entrepreneurial personality' is associated with greater future entrepreneurial intentions in both groups of students.		279-314
Annisa et al. (2021)	The role of family support and internal locus of control in entrepreneurial intention of vocational high school students.	Examine the relationship between family support and internal locus of control with the EI of grade XII students at Muhammadiyah Vocational High School 3.	93 students (XII grade)	The results indicated a positive and significant relationship between family support and internal locus of control with EI, family support with EI and internal locus of control with EI. The contribution of internal locus of control to EI is more dominant than the contribution of family support.	Relationship between variables: family support and internal locus of control with EI.	International Journal of Evaluation and Research in Education 10(2), pp. 381-388
Luis-Rico et al. (2020)	Entrepreneurial interest and competence among Spanish youth: An analysis with artificial neural network.	Determine the entrepreneurial interest of young Spaniards people between 15 and 18 years old.	1764 secondary school students in Spain.	Young Spaniards express a medium level of interest in entrepreneurship.	Factors determining EI in high school.	Sustainability (Switzerland) 12(4) pp.1351
Tentama & Yusantri (2020)	The role of entrepreneurial intention in predicting vocational high school students' employability.	Discuss the role of entrepreneurial intentions in student employability.	86 students (grade XII) at Vocational Secondary School Koperasi Yogyakarta Indonesia.	Data reveals that there is a positive correlation between EI and employability: the level of employability can be predicted based on EI.	Positive correlation between variables: EI and employability.	International Journal of Evaluation and Research in Education 9(3), pp. 558-563
Kološta et al. (2020)	The influence of contextual and individual factors on entrepreneurial intentions among youth in transitional rural Slovakia.	Identify factors that influence EI among senior high school students.	The data was collected in three rural regions of Slovakia.	Leadership and proactive personality as career anchors, and perceived support from family and friends, are prominent factors explaining EI among these young people.	Determinants of EI in secondary education.	Communist and Post-Communist Studies 53(2), pp. 113-132
Patuelli et al. (2020)	Entrepreneurial intention among high-school students: the importance of parents, peers and neighbors.	Testing the influence of the variables: parents, peers and neighbors.	Students (about 2000) in the second year of secondary school (15 and 16 years old) in the city of Palermo, Italy.	Evidence of a strong parental effect and secondary peer effects on students' intentions. We also detected clear endogenous effects of neighborhood and general context.	Influence of variables: parents, peers and neighbors on students' EI.	Eurasian Business Review 10(2), pp. 225-251
Van Haepere et al. (2020)	From the perception of one's entrepreneurial skills to the intention to start a business: Some results from an evaluation of measures raising awareness about entrepreneurial spirit among high school students in Wallonia.	Measure the effect of awareness-raising actions on students' entrepreneurial intentions, skills and attitudes.	Secondary school students from Wallonia, Belgium.	The result calls for these actions to be continued. We have also shown an important and significant gender effect, in that women who want to become entrepreneurs face specific obstacles.	Actions to raise awareness of students' entrepreneurial intentions, skills and attitudes.	Reflets et Perspectives de la Vie Economique 57(3), pp. 73-85
Londono et al. (2020)	Understanding the entrepreneurial intentions of youth: a PLS multi-group and FIMIX analysis using the model of goal-directed behavior.	Testing the goal-directed behavior (MGB) model in predicting the entrepreneurial intentions of high school students.	643 students (260 boys and 383 girls) from 34 secondary schools in a large metropolitan city.	The results encourage the study of entrepreneurship from an early age and the importance of teaching how to overcome negative emotions in the entrepreneurial process.	Expansion of the tools of theoretical models that are useful for explaining entrepreneurial intentions such as desires, emotions and behavior.	Journal of Entrepreneurship in Emerging Economies, 13(3), pp. 301-326
Garrido – Yserte et al. (2020)	The relationship between capacities and entrepreneurial intention in secondary school students.	Analyzing entrepreneurial skills in terms of motivation, risk, dedication, empathy and communication.	897 secondary school students.	The results indicate that there is a high percentage of potential entrepreneurs in secondary education and that entrepreneurship is not limited to a specific area, but is recognized as an option for future employment, regard less of the studies the students intend to pursue.	Entrepreneurial skills in terms of motivation, risk, dedication, empathy and communication.	Economic Research- Ekonomiska Istrazivanja 33(1), pp. 2322-2341
Tentama & Abdussalam (2020)	Internal locus of control and entrepreneurial intention: a study on vocational high school students.	This study aimed to empirically test the relationship between internal locus of control and entrepreneurial intention on vocational high school students.	The population in this study was all students of class XII at Vocational High School 5 Yogyakarta as many as 392 students. Research participants in total was 171 students.	The results of data analysis showed a significant positive relationship between internal locus of control with entrepreneurial intention with a significance level.	The locus of students' internal control variable can predict students' entrepreneurship intention.	Journal of Education and Learning (Edulearn) Vol. 14, No. 1, February, pp. 97-102.
Tentama & Paputungan (2019)	Entrepreneurial intention of students reviewed from self-efficacy and family support	Examining the role of self-efficacy and family support in EI in secondary vocational	171 students from different areas: ceramics, visual	There was a positive relationship between self-efficacy and family support simultaneously with EI; there	Analysis of self- efficacy and family support in students' EI.	International Journal of Evaluation and Research in Education

	in vocational high school.	school students.	communication design, wood animation, metal, leather.	was a positive relationship between self-efficacy and EI; there was a positive relationship between family support and EI. Self-efficacy as an internal factor makes a more dominant contribution than family support as an external factor.		8(3), pp. 557-562
Salami (2019)	Examining the emerging entrepreneurial mindset in adolescence: A study in Nigeria.	Investigating the relationship between family environment, Self-Efficacy (SE) and proactive personality in the entrepreneurial intention of high school adolescents and the mediating role of self-efficacy.	250 secondary school students selected from six secondary schools in Ibadan, Oyo State, Nigeria.	The results showed that all the contextual and individual factors had a significant relationship with EI and SE partially mediated the relationship.	Relationship of contextual and individual factors with entrepreneurial intention.	International Journal of Psychology 54(1), pp. 70-79
Bux & Vuuren (2019)	The effect of entrepreneurship education programmes on the development of self-efficacy, entrepreneurial intention and predictions for entrepreneurial activity.	Investigating the correlation between Entrepreneurship Education (EE) and the development of self-efficacy in young South African high school students, and whether the duration of the program would influence the degree of self-efficacy development and its correlation with entrepreneurship and EI.	Students in the education program aged 15 to 18. 637: for short-term entrepreneurship. 381: for long-term entrepreneurship.	The research found positive correlations between self-efficacy that can be developed through the Entrepreneurial Activity.	Correlation between exposure to entrepreneurship education and the development of self-efficacy.	Acta Commercii 19(2), pp.615.
Saptono et al. (2019)	Determinant factors of development entrepreneurial education: lesson from senior high school in Indonesia.	Obtaining information related to entrepreneurial education, subjective norm and entrepreneurial attitude in relation to EI.	251 senior high school students from three schools in Jakarta, Indonesia.	Entrepreneurial attitude is a mediating variable between entrepreneurial education and entrepreneurial intention, as well as between subjective norm and EI.	Relationships between entrepreneurial education and the variables a subjective norm and entrepreneurial attitude and EI.	Universal Journal of Educational Research 7(12), pp. 2837- 2843
Mothibi & Malebana (2019)	Determinants of entrepreneurial intentions of secondary school learners in Mamelodi, South Africa.	Testing whether the Theory of Planned Behavior (TPB) can predict the EI of secondary school learners in Mamelodi, South Africa.	349 students from 11 secondary schools in Mamelodi.	Entrepreneurial intentions of secondary school students were predicted by the TPB constructs: perceived behavioral control, attitude and subjective form.	The entrepreneurial intentions of secondary school students were predicted by the TPB constructs: perceived behavioral control, attitude and subjective form.	Academy of Entrepreneurship Journal, 25(2), pp. 1- 14
Sandroto et al. (2018)	Entrepreneurial intention and competencies of vocational and high school graduates in Indonesia.	Understanding the intention of vocational school graduates to become entrepreneurs and their entrepreneurial skills.	374 Graduated vocational schools.	Vocational school graduate has moderate desire to become entrepreneurs.	EI of vocational education students.	Pertanika Journal of Social Sciences and Humanities 26(T), pp. 225-236
Odoardi et al. (2018)	Effects of beliefs, motivation and entrepreneurial self-efficacy on entrepreneurial intentions: The moderating role of family support.	Deepening our understanding of the relationship between entrepreneurial self-efficacy, beliefs, motivation, family support and entrepreneurial intentions by developing a moderated mediation model.	446 students from four different secondary schools	Entrepreneurial self-efficacy partially mediates the effect of beliefs and motivations on entrepreneurial intention. This mediation is moderated by family support, which is also directly related to entrepreneurial intentions.	Relationship between entrepreneurial self-efficacy, beliefs, motivation, family support and entrepreneurial intentions.	Annals of Psychology 21(3), pp. 185-205
Obschonka et al. (2017)	Entrepreneurship as a twenty-first century skill: entrepreneurial alertness and intention in the transition to adulthood.	Testing a mediation model with skills between personality and alertness and EI.	523 students from secondary schools in Helsinki, Finland.	Entrepreneurial alertness and career intention are independent of the emerging entrepreneurial mindset, but are both an expression of the entrepreneurial personality structure and are predicted by different underlying competencies: leadership and self-esteem mediate the personality- entrepreneurial intention link, and leadership, creativity and proactivity motivation mediate the personality- entrepreneurial alertness link.	Testing a mediation model with competences between personality, alertness and EI.	Small Business Economics 48(3), pp. 487-501
Xu et al. (2016)	Factors influencing entrepreneurial intentions of Chinese secondary school students: an empirical study.	Analyze the effects of entrepreneurship education, personal traits and demographics on attitude,	1.018 students in China.	The majority of students had never received entrepreneurship education, resulting in lower EI and the perception of entrepreneurial	The TPB mediating the effects of entrepreneurship education.	Asia Pacific Education Review 17(4), pp. 625- 635

		subjective norm, Perceived Behavioral Control (PBC) and entrepreneurial intentions (EI).		behavioral performance as unrealistically easy. A cognitive bias was revealed in the students' perceptions of entrepreneurship, and entrepreneurial behaviors were seen as activities oriented towards external causes. The gender and entrepreneurial experience of the family member also influenced EI and related variables. Entrepreneurship education and personal characteristics (locus of control and innovativeness) were positive predictors of EI and their effects on EI were completely mediated by TPB.		
Rosique- Blasco et al. (2016)	Entrepreneurial skills and socio-cultural factors: an empirical analysis in secondary education students.	Exploring how entrepreneurial skills (such as creativity, proactivity and risk tolerance) and sociocultural factors (such as role model and entrepreneur image) affect secondary school students' propensity to choose entrepreneurship.	1244 secondary school students from the Region of Murcia (Spain).	Skills as well as socio-cultural factors (creativity, proactivity and risk-taking) positively affect the EI of secondary school students and promote entrepreneurial careers.	Factors that positively affect secondary school students' EI and promote entrepreneurial careers.	Education and Training 58(7-8), pp. 815-831
Ana et al. (2016)	Entrepreneurial intentions of tourism vocational high school students in Indonesia and Malaysia.	Comparing the EI of tourism vocational high school students in Indonesia and Malaysia.	Total of 228 Students. 114= Malaysia. 114 = Indonesia.	Belief and self-efficacy are the most dominant components associated with EI among students from both countries. Malaysian tourism vocational secondary school students have stronger entrepreneurial intentions, while self-efficacy and belief play an important role in influencing intention.	Comparison between the EI of tourism vocational high school students in two different countries.	Journal of Technical Education and Training 8(2), pp. 12-20
Jusoh & Koku (2016)	The efficacy of providing entrepreneurship education.	Examining the entrepreneurial outlook of students who have taken the integrated life skills courses required in secondary education in Malaysia.	100 students from two selected schools.	There is a positive relationship between entrepreneurship education in secondary schools and students' entrepreneurial intentions and perceptions of entrepreneurship.	Analysis of the entrepreneurial outlook of students taking the required integrated life skills courses in secondary school in Malaysia.	World Review of Science, Technology and Sustainable Development 12(3), pp. 257-273
Elqadri et al. (2016)	Testing model student entrepreneurial intentions SMK in the Yogyakarta.	Discussing the factors that contribute to the entrepreneurial intention of professional students in Indonesia, especially in Yogyakarta.	202 Vocational school students (Class XII) in Yogyakarta, Indonesia.	The tendency to take risks significantly affects self- efficacy. Entrepreneurial attitude significantly influences EI. Subjective norms significantly influence EI. Self-efficacy significantly affects EI.	Factors that contribute to the intention to become an entrepreneur.	International Journal of Applied Business and Economic Research 14(3), pp. 2077-2095
Marques et al. (2012)	Entrepreneurship education: How psychological, demographic and behavioral factors predict the entrepreneurial intention.	Analyzing factors that precede EI among high school students and establishes causal relationships between psychological, demographic and behavioral factors.	The total number of students was 202. 104= attended general programs and 98= vocational courses.	EI of secondary school students is influenced by such demographic, psychological and behavioral factors. However, the chance of becoming an entrepreneur in the future remains independent of whether or not students have already experienced engagement with entrepreneurship related topics with no impact on EI.	Factors that precede EI among students and establish causal relationships between psychological, demographic and behavioral factors.	Education and Training 54(8), pp. 657-672
Pihie & Bagheri. (2009)	Developing future entrepreneurs: A need to improve science student entrepreneurial participation.	To investigate entrepreneurial intention and behavior among "science" and "arts" students in Malaysian secondary schools based on the Theory of Planned Behavior (TPB).	1357 students.	Students of "Arts" from the commerce and entrepreneurship discipline obtained higher mean scores for all constructs (EI, subjective norm, social support and entrepreneurial efficacy). Students with a solid academic background in the "science" program should receive adequate education and training in entrepreneurship to improve their participation to create future entrepreneurial human capital.	The relationship between the TPB constructs and students' EI.	International Journal of Knowledge, Culture and Change Management 9(2), pp. 45-57

This analysis of the articles allowed them to be grouped into 4 thematic lines (Figure 8).

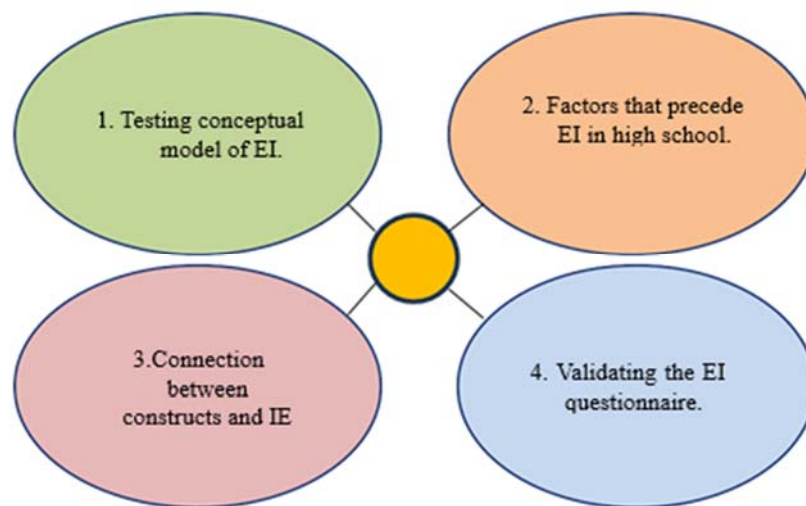


Figure 8. Thematic lines

The first thematic line consists of testing conceptual model of EI. This testing is crucial for consolidating theories, developing reliable measurement instruments, improving educational programs and promoting an entrepreneurial culture. The Theory of Planned Behavior (Ajzen, 1991) is one of the most influential and widely used models for understanding and predicting human behavior and EI. This theory developed by Ajzen postulates that intention is the best predictor of behavior. This intention is influenced by three main components: attitude, subjective norms and perceived behavioral control. Several authors have tested different conceptual models of EI. Two examples can be highlighted. First, Mothibi and Malebana (2019) who tested the TCP (Ajzen, 1991) with a sample of 349 students from 11 high schools in Mamelodi, South Africa. According to Mothibi and Malebana, the result showed that the TCP can indicate the absence or presence of EI in students. The second example in this thematic line comes from Obschonka et al. (2017). According to Obschonka et al. (2017), the model proposes two mediations. The first mediation is between skills and personality and the second mediation is between alertness and EI. Obschonka et al. (2017) found that entrepreneurial alertness and EI are structures of the entrepreneurial personality. Obschonka et al. (2017) points out that intentions are predicted by mediation between competencies. For example, the competencies of leadership and self-esteem mediated the relationship between personality and EI. The competencies of creativity and proactivity mediated the relationship between personality -entrepreneurial alertness.

The second thematic line focuses on the influence of different factors on the EI of high school students. Three examples are cited in this group. The first example is Elqadri et al. (2016) who discovered two important aspects. The first aspect is that the risk-taking factor influences self-efficacy. The second aspect is that the subjective norms factor significantly influences EI. These aspects were identified in a sample of 202 vocational education students in Indonesia. The second example is presented by Vesci et al. (2022). Vesci et al. (2022) reveals that the role of social media in students' cognitive processes influences their desire to become entrepreneurs. The findings were made in a sample of 363 high school students in southern Italy (Vesci et al., 2022). The third example is the study by Saptono et al. (2019). This study reveals that entrepreneurial attitude is a mediating factor between entrepreneurial education and EI and between subjective norms and EI. Saptono et al. (2019) tested 251 senior high school students from three schools in Jakarta, Indonesia.

The third thematic line group together the findings that EI can be studied using different constructs. Tentama and Papatungan (2019) show that EI can be studied from 3 constructs. The first construct is locus of control and the second construct is self-efficacy. The third construct is family support. Tentama and Papatungan (2019) found that the contribution of locus of control to EI is more dominant than the contribution of family support and self-efficacy. Tentama and Papatungan (2019) found that there is a positive relationship between EI and employability. According to Kološta et al. (2020) attitude, self-efficacy and subjective norms are the constructs that most influence EI.

The fourth thematic line corresponds to the validation of the EI questionnaire. The validation of the questionnaires presented in the literature shows the original TPB model (Ajzen, 1991). The studies by Pihie and Bagheri (2009) found a positive relationship between the TPB constructs and EI. This finding by Pihie and Bagheri (2009) was based on a sample of 1357 high school students in Malaysia. Meanwhile, Martínez-Gregorio and Sara (2022) tested a competing model of the TPB on a sample of 226 Spanish students. Martínez-Gregorio and Sara (2022) found that the modified version of the original TPB model is also suitable for high school.

3.3 EI in High School Education: An International Overview

EI is defined as a person's willingness to start a new business. EI has been studied globally because of its importance in promoting economic development and innovation. Analysis of EI from an international perspective reveals a diverse panorama, influenced by cultural, economic, social and political variables. The Scopus, Web of Sciences and ERIC databases survey on EI in high school education reveals that publications are concentrated in Indonesia and Malaysia. Data about education system in Malaysia and Indonesia reveals that it has been integrated entrepreneurship programs into their high school curricula, making entrepreneurship a formal part of education. This integration contributes to arousing students' interest in entrepreneurship from an early age and consequently fosters financial and institutional support for academic research.

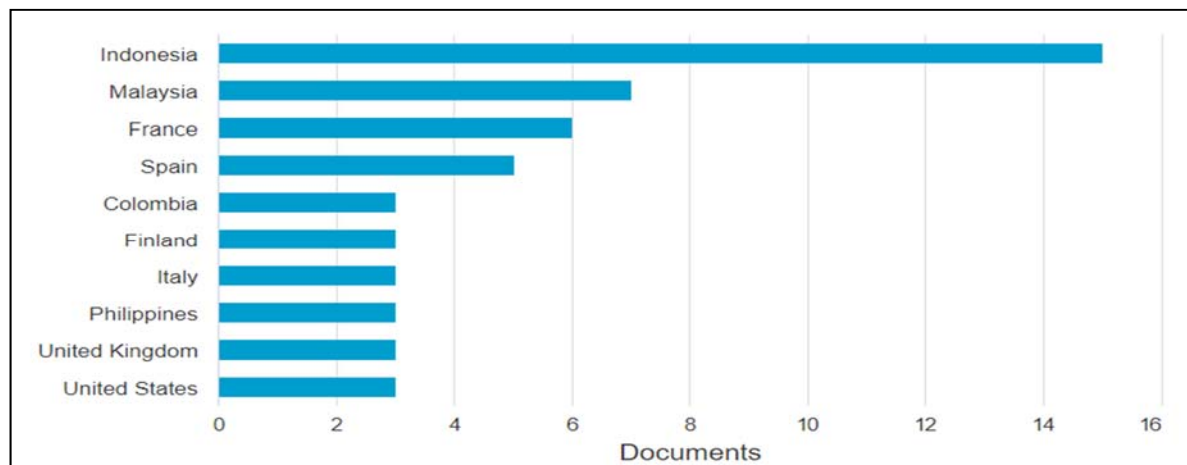


Figure 9. World scenario of academic productions on IE in high school education

4. Innovative Contributions and Practical Implications

The results of the study are innovative and contribute to filling a gap in the literature. The gap is the lack of academic papers that seek to analyze the state of academic production of EI in high school education. The results of this research broaden the understanding and knowledge of EI in high school education and promote the interfaces and connections between high school education and entrepreneurial education.

The results have many practical implications. Only six practical implications will be emphasized. First, high school principals, coordinators and teachers can use the results to stimulate reflection on the centrality of the student in the teaching and learning processes, aiming to develop entrepreneurial competencies and skills. Second, teachers can use the results to develop lectures and pedagogical activities aimed at promoting entrepreneurial competencies and skills in high school students. Third, the results can help mitigate the restructuring of teaching curriculum guidelines and pedagogical projects to focus on entrepreneurship. Fourth, the findings can drive changes in the role of teachers to connect entrepreneurship across disciplines and also stimulate teachers in the new roles. Fifth, high school principals and coordinators can use the results to create connections and interfaces between high school education and higher education. The sixth practical implication is the building of research agenda. The research findings, particularly the mapping of thematic lines, could help in building a research agenda, with several research avenues.

5. Final Considerations

EI helps in understanding whether the person has a set of characteristics to open a new business. EI is based on the interaction between personal characteristics, perceptions, values, beliefs, socio-demographic and even

environmental variables. In this direction, according to Xiao and Watson (2017) and taking into account the identification of existing gap in academic literature, the basic question was formulated and the research objective was established. The gap is the lack of academic papers that seek to analyze the state of academic production of EI in high school education.

The study objective was fully achieved. This study carried out the systematic review of the literature to map the main lines of research in academic productions that analyze high school education. The academic productions available on the Scopus, Web of Science and ERIC databases from 2000 to 2022 were checked. A total of 33 publications were selected for analysis in this period.

The findings of the study are innovative and contribute to filling a gap in the literature. The findings are innovative because they fill the gap in the academic literature. The research results have many practical implications for various actors in high school education and higher education. The research results may contribute to the building of a research agenda. One of the findings of study was the mapping of four thematic lines, based on the analysis developed in the 33 articles. The first thematic line mapped is about testing conceptual model of EI. This testing is crucial for consolidating theories, developing reliable measurement instruments, improving educational programs and promoting an entrepreneurial culture. The second thematic line focuses on the influence of different factors on the EI of high school students. The third thematic line groups together the findings that EI can be studied using different aspects and constructs. The fourth thematic line mapped is linked to validation of the EI questionnaire.

Despite the relevance of the results of this research, five recommendations stand out as future research agendas. The first focuses on how current high school curricula influence students' entrepreneurial intentions. The second proposal is to investigate which methodological practices can be implemented to contribute to the development of entrepreneurial skills and competences in high school education. The third is to investigate how different methodological approaches in high school education influence students' entrepreneurial intention. The fourth recommendation is to explore students' perceptions of entrepreneurship and how these perceptions are shaped by education. And the fifth is to evaluate the effectiveness of existing entrepreneurial education programs in high schools.

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No additional data are available.

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