

Leveraging Scopus AI for Exploring the Entrepreneurial Competency Framework (EntreComp)

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Abstract

Difficulties in understanding the study model or framework are often a significant challenge for most postgraduate students, which can create the perception that postgraduate-level studies are particularly difficult. Now, along with the advancement of technology, applications that utilize assistance from artificial intelligence (AI) are more commonly referred to simply as 'artificial intelligence' or 'AI' have made the learning process easier and clearer. This study aims to explore how Scopus AI aids postgraduate students' understanding of the Entrepreneurial Competency framework (EntreComp). An autoethnography qualitative research design is utilized, with the researcher acting as the primary instrument for data collection and analysis. The analysis results indicate that five key elements in the Scopus AI display facilitate information exploration related to the Entrepreneurial Competency framework (EntreComp). These elements are *summary*, *expanded summary*, *concept map*, *topic expert*, and *go deeper*. Scopus AI's user-friendly display feature has made it easier for postgraduate students to get accurate information quickly and easily based on the Scopus database. These elements help students easily access and understand complex information, leading to better learning outcomes. In summary, Scopus AI effectively aids postgraduate students in grasping the Entrepreneurial Competency (EntreComp) framework. The principal implications of employing this tool within the context of postgraduate education in the contemporary technological environment include enhanced accessibility and a comprehensive understanding of the framework. These factors contribute to a more effective and interactive, data-driven learning process.

Keywords:

Scopus AI, entrepreneurial competency framework (entrecomp), artificial intelligence, postgraduate, autoethnography

INTRODUCTION

Entrepreneurship plays a crucial role in a country's economic development. In this context, the European Commission has promoted entrepreneurship as a key competency through one of its key initiatives, 'The Entrepreneurship Competence Framework' (EntreComp). Published by the European Commission in 2016, EntreComp establishes a clear framework to improve entrepreneurship education (Bacigalupo, M., 2016). This framework encompasses the various dimensions that are essential for building entrepreneurial skills, including the knowledge, skills, and attitudes necessary to become successful entrepreneurs. Postgraduate researchers and students often need help understanding these frameworks and need effective tools and

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resources to aid their learning. Understanding an entrepreneurial framework such as EntreComp requires in-depth analysis as well as access to comprehensive reference resources. With the increasing volume of literature, students and researchers often need help to navigate and sift through relevant information (Mertens, G. E., 2023; Bussell, H., et al., 2020). The study process requires more than tools that can integrate multiple resources into a single platform, making it more time-consuming (Khalid, S., & Wu, S., 2020). As a result, they need more support to thoroughly understand the EntreComp framework and its application in their studies.

In today's digital age, artificial intelligence (AI) is one of the most effective tools for facilitating various research processes (Zouya & Yunus, 2024). AI tools such as Elicit and Consensus offer valuable support to researchers by streamlining the analysis of extensive paperwork. This innovation enhances the efficiency of discovering relevant information, ultimately advancing research efforts. Melendez (2024), in his writing, has elaborated on several AI tools, such as Elicit, which offers a solution for systematic reviews by automating the search and compilation of papers, as well as reducing costs and saving a researcher's time. He also discussed Consensus as an AI tool that prepares summaries from various studies and highlights scientific consensus on specific questions, thus facilitating access to information that is difficult to reach through traditional searches. As noted by Zouya and Yunus (2024), the positive correlation between AI patent applications and labor productivity in China's economic sector underscores the critical role of AI research and innovation in driving efficiency and productivity. To maximize these benefits, policymakers are encouraged to focus on strengthening educational systems and human capital development, ensuring the workforce is equipped with the skills necessary to effectively leverage AI technologies in research and beyond. JStor introduces an interactive approach by providing customized paper summaries and allowing users to interact deeply with the text. Semantic Scholar also integrates AI to provide term definitions as well as summaries of "tl; dr," which helps researchers understand technical content more easily. This study will focus on Scopus AI as one of the AI tools that allows researchers to evaluate papers based on metadata and expert writers, accelerating understanding in new areas. AI-assisted applications such as Scopus AI offer solutions to the challenges faced by students and researchers by providing easy access to relevant literature, as well as more directed and systematic data analysis. Scopus AI can integrate various elements in a single platform, such as article summaries, concept maps, and expert identification (Elsevier, 2024), which can assist researchers in understanding and exploring entrepreneurial frameworks such as EntreComp more effectively.

Scopus AI not only facilitates access to information but also enhances the quality of analysis by providing tools that can generate a deeper understanding of the Entrepreneurial Competency (EntreComp) framework. Scopus AI clarifies the relationships within the EntreComp framework using detailed summaries, dynamic concept maps, and in-depth analysis. This not only saves time but also ensures that the studies conducted are more accurate and based on solid data. This article aims to examine the elements in Scopus AI that aid in the exploration and simplify postgraduate students' understanding of the Entrepreneurial Competency (EntreComp) framework. The questions of this study are as follows:

1. What are the elements in Scopus AI that help postgraduate students explore and facilitate their understanding of the Entrepreneurial Competency framework (EntreComp)?

This question will focus the analysis on the importance of the Scopus AI application in postgraduate research and education. The use of Scopus AI is discussed in the context of facilitating the postgraduate understanding and learning process. This technology has the

potential to make a significant contribution in strengthening understanding and highlighting the potential use of AI in research related to the Entrepreneurial Competency framework (EntreComp) in particular.

LITERATURE REVIEW

Scopus AI

Scopus AI, is an intelligent search tool launched in May 2024 developed by Elsevier, based on generative intelligence technology (GenAI) aimed at providing clearer and faster insights to users (Elsevier, 2024). Generative intelligence technology uses AI to create new content such as text, images, audio, or video based on the given inputs e.g. GPT models that generate text in multiple languages. This tool was developed in close collaboration with the academic community to ensure that it meets the latest needs and wants in research. Designed with ease of use as the primary focus, Scopus AI allows researchers to quickly get answers by simply asking questions. Derived from natural *language processing* (NLP), Scopus AI allows users to ask questions, statements, or hypotheses in plain language without having to enter complex Boolean keywords or operators. Elsevier (2024) also stated that the Scopus AI technology is capable of processing more than 7,000 publishers available in the Scopus database, where it focuses on documents published since 2003, and produces referenced and easy-to-understand summaries based on the abstract content obtained. The tool accesses the extensive Scopus database, which includes more than 27,800 peer-reviewed journals and more than 330,000 books, to produce indexed research results-based summaries (Times Higher Education, 2024). This makes Scopus AI a very useful tool in accelerating the search and learning process in the academic world.

Elsevier (2024) also explained that the Scopus AI tool uses its extensive database, Scopus, covering various types of academic content such as articles, books, book chapters, conference papers, reports, reviews, brief surveys, and data papers. This content has been carefully selected by the independent Scopus Selection Board and Content Advisors, who constantly review the content to ensure quality and appropriateness. However, in an article published by Times Higher Education (2024), Sahar Abuelbashar, Solutions Account Manager for Research Intelligence at Elsevier, stated that Scopus AI does not take conference reviews and erratum into account in its search process. Articles that have been retracted are also excluded from Scopus AI searches, ensuring that the responses provided are based on the latest and most relevant information in the academic field by displaying content published within the last 20 years only. In addition, Scopus AI can provide information summaries with three different confidence levels to ensure transparency and verification of the information provided (Times Higher Education, 2024). If the user's confidence level is moderate or low in the responses given, users can refine the questions and check the Scopus AI summary more carefully. This mechanism promotes transparency and allows for information verification, as each summary includes a citation link for users to assess the original source and explore the information in greater depth.

In differentiating itself from other GenAI tools, Elsevier (2024) highlights that Scopus AI's unique advantage lies in its stricter and more transparent approach. This tool minimizes the risk of hallucinations and bias by using only high-quality, verified content from the Scopus database, and its embedded Copilot search tool provides detailed explanations of how it parses and optimizes user queries. Scopus AI employs an internally developed and patented RAG Fusion modeling approach, which enhances the quality of search results and summaries generated by its Large Language Model (LLM) (Elsevier, 2024). This approach enables Scopus

AI to deliver more accurate and relevant responses, thereby reducing potential biases in the information retrieval process. The responses generated by Scopus AI undergo regular testing through two rigorous evaluation frameworks to ensure the quality and reliability of the information provided. Additionally, each response produced by Scopus AI includes clear references to the documents used, along with an assessment of the confidence level in the response's accuracy. This transparency makes Scopus AI a more reliable and relevant tool for academic research.

Regarding security, Elsevier (2024) states that Scopus AI ensures data security and user privacy by adhering to responsible AI principles and Elsevier's privacy guidelines. Elsevier confirms that the use of large language models (LLMs), such as OpenAI's ChatGPT, occurs via the Microsoft Azure platform, with a commitment that transmitted information will not be stored or used to train public models. Moreover, all content utilized by Scopus AI is reviewed and curated by experts on the Scopus Content Selection and Advisory Board, ensuring that the information generated is accurate and pertinent to the user's query (Elsevier, 2024). Another distinct feature of Scopus AI's usability is its multilingual capability, which allows it to interpret queries in languages other than English. Although English remains the primary language for most users, the ability to pose questions in one's native language is a notable and valued feature. This capability not only increases the tool's accessibility but also facilitates information access for users regardless of their primary language, enhancing the research experience in diverse linguistic contexts. With the launch of the Copilot query interpretation tool in August 2024, Scopus AI can now interpret queries in multiple languages, expanding accessibility to a broader global user base (Elsevier, 2024).

In summary, Scopus AI provides a unique and powerful approach to supporting researchers in obtaining accurate and timely information. Leveraging advanced technology and close collaboration with the academic community, Scopus AI continues to evolve as an essential tool in contemporary research. It not only provides concise, high-quality information summaries but also includes additional features that enable users to further explore and delve into topics of interest comprehensively.

METHODOLOGY

This study employs an autoethnographic approach to explore the researcher's personal experience of using Scopus AI as a tool for learning and research. Autoethnography is a qualitative research method that merges elements of autobiography and ethnography, enabling researchers to systematically examine their personal experiences in relation to broader cultural and social contexts (Ellis et al., 2011). This method is particularly powerful in capturing the subjective perspectives of researchers, offering insights that traditional methods might overlook. According to Rodriguez and Ryave (2002), autoethnography positions the researcher as both the subject and the instrument of study, which allows for a more intimate and reflexive understanding of the phenomena being investigated (Steketee et al., 2020). Additionally, this approach emphasizes critical reflexivity, requiring the researcher to continuously analyze how their own biases, emotions, and interactions shape the research process (Mateu, 2023). By applying this method, the study aims to provide an in-depth exploration of the use of Scopus AI in academic research, connecting personal narratives to larger cultural implications, such as the role of artificial intelligence in transforming scholarly practices.

In this study, Scopus AI was utilized to systematically search for literature related to the Entrepreneurial Competency framework (EntreComp), providing efficient access to academic resources, and enhancing the research process. Through reflective engagement, the researcher documented key aspects of the platform, such as its ability to streamline research

workflows and facilitate the synthesis of information, while also critiquing its limitations, including algorithmic biases, usability challenges, and adaptability to specific research needs. The integration of personal narrative and reflexive critique aligns with the principles of autoethnography, as highlighted by Tarisayi (2023) who advocate for using evocative storytelling to uncover cultural phenomena. This method not only enables a deeper understanding of Scopus AI's role in academic inquiry but also highlights its broader implications for the use of artificial intelligence in supporting learning and research. By combining personal insights with critical analysis, the study contributes to the ongoing discourse on the impact of emerging technologies on academic practices, emphasizing the importance of reflexive methodologies in understanding complex phenomena. This process involves several systematic steps as follows:

Step 1: Researchers log in to the Scopus website through the institution's library page.

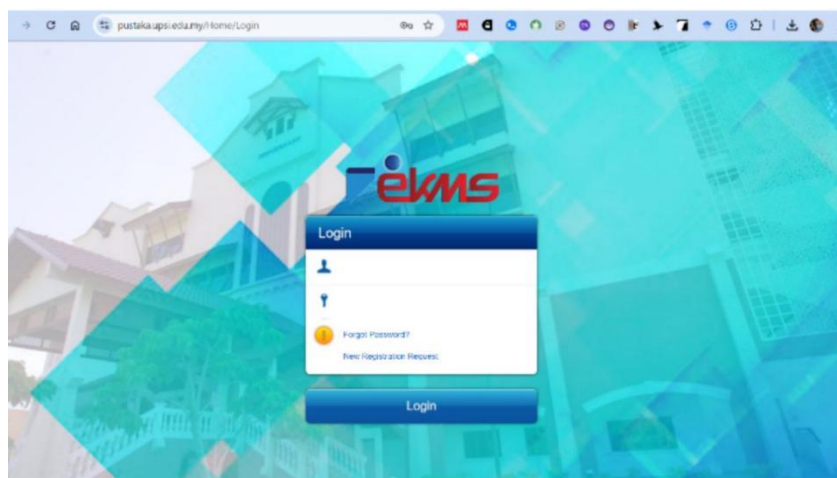


Figure 1: View of the front page of institutional library registration

Step 2: Once the Scopus AI display appears in the 'Start exploring' section,' researchers enter the keyword "EntreComp Framework" in the search box. These keywords will display relevant references starting from 2003. After entering the keyword, the investigator presses the 'enter.' key. Figure 2 shows the main display for Scopus AI.

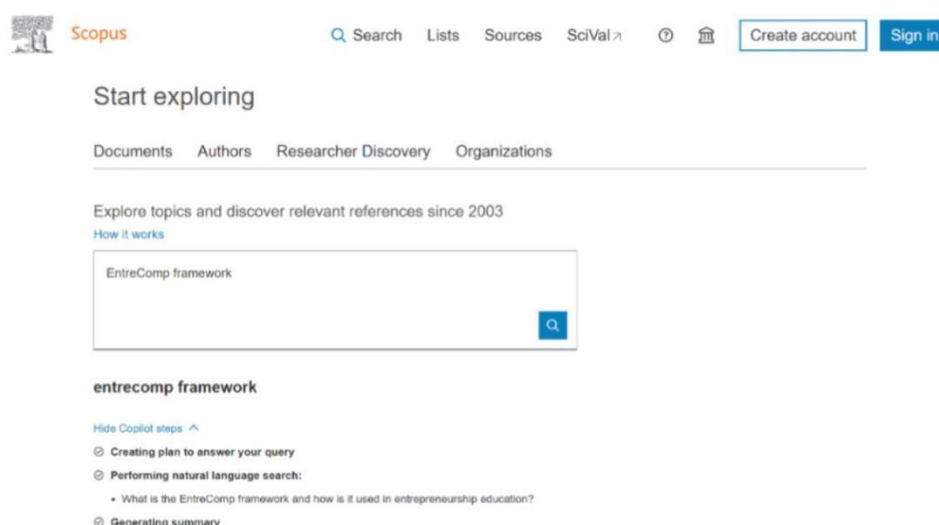


Figure 2: Scopus AI view to start the search process

Step 3: In the third step, Scopus AI utilizes Copilot technology, an artificial intelligence (AI) designed to assist users across various applications, including research processes. Copilot functions as a virtual assistant that helps users perform tasks more effectively. At the initial stage, Copilot formulates a plan by determining the best approach to answer a question or complete a given task. This approach involves breaking down the user's request into manageable steps or smaller tasks. Next, Copilot performs a search using natural language processing (NLP) to locate information relevant to the user's query. In this study, the researcher entered a search for the "EntreComp framework," directing Copilot to find information related to this term and its application within the context of entrepreneurship education. After gathering the necessary information, Copilot generated a summary or response to the researcher's query, providing a concise, relevant, and easily understandable overview of the "EntreComp framework" and how it is utilized in entrepreneurship education.

Step 4: The fourth step involves displaying the resulting 'Summary,' which provides a summary of citations based on abstracts from articles or materials related to the Entrepreneurial Competency Framework (EntreComp). In this display, Scopus AI lists brief citations from sources within the Scopus database that are relevant to the topic. This feature allows researchers to gain a general overview of the content of related articles and assess the significance of each source within the context of this study. Figure 3 illustrates the 'Summary' display related to the Entrepreneurial Competency Framework (EntreComp).

Step 5: The fifth step involves the researcher's evaluation of relevant articles through the citations generated by Scopus AI. At this stage, the display of small numbers at the end of brief sentences, as shown in Figure 3, provides direct links to the original articles relevant to the EntreComp framework. Scopus AI displays a list of related articles on the right side of the page, divided into two sections. At the top, newly published articles are displayed, while at the bottom, original articles widely referenced by other researchers are listed. Scopus AI also provides information on the citation count for each recommended article, allowing researchers to more easily and accurately assess the relevance and impact of each source.

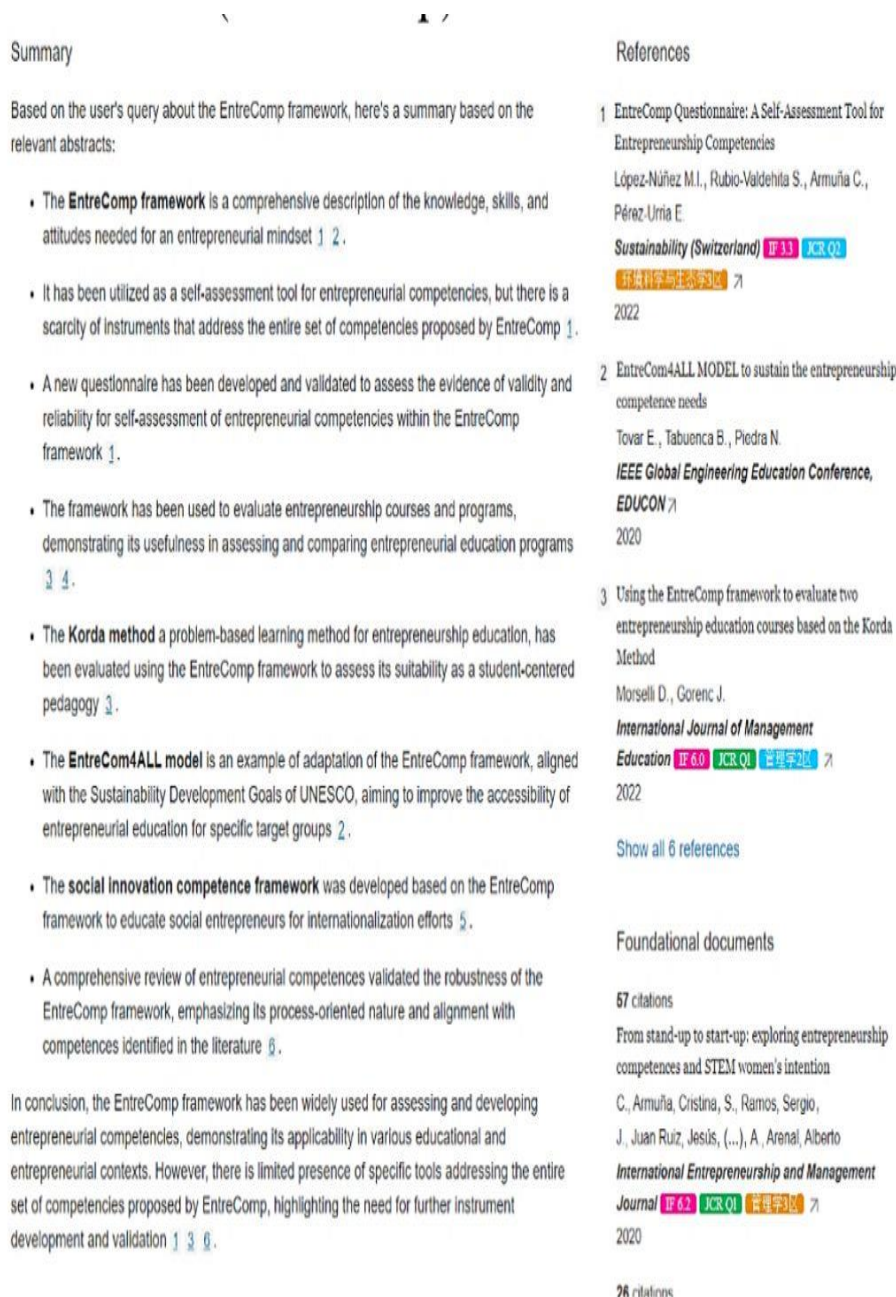


Figure 3: Display of the Scopus AI "Summary" function related to the Entrepreneurial Competency framework (EntreComp)

Step 6: Further, researchers click on the 'expanded summary' button to get more information about the Entrepreneurial Competency (EntreComp) framework. This process allows researchers to access more detailed descriptions of relevant articles, providing a deeper understanding of the content and context of each article studied. By using this function, researchers can evaluate and filter information more effectively, ensuring that all important aspects related to the EntreComp framework are obtained and analysed. This step is illustrated in Figure 4.

Expanded summary G., F
Sho

Based on the user's query, I will address each question in turn using relevant information from the provided abstracts.

Key Components of the EntreComp Framework:

- The EntreComp framework encompasses a range of competencies related to entrepreneurship, including opportunity identification, creativity, and financial literacy [1](#).
- It emphasizes the process-oriented nature of entrepreneurship, from opportunity identification to value creation [1](#).
- The framework consists of three distinct areas: ideas and opportunities, resources, and into action [2](#).

Contribution to Entrepreneurial Education:

- The EntreComp framework contributes to entrepreneurial education by providing a shared definition of entrepreneurship competence and supporting its development [2](#).
- It has been found to positively impact entrepreneurial competencies, especially in areas such as financial literacy, motivation, and initiative taking [3](#).
- The framework aligns with the European Union's emphasis on entrepreneurial skills as essential for creating welfare and economic sustainability [4](#).

Different Levels of Proficiency in the EntreComp Framework:

- The EntreComp framework defines entrepreneurship as "the value that is created, financial, cultural, or social" and highlights the importance of developing an entrepreneurial mindset and behaviors [5](#).
- It outlines three distinct areas of competence: ideas and opportunities, resources, and into action, each comprising several sub-competences [2](#).
- The framework has been used to evaluate entrepreneurship courses and has been found to explain start-up behavior and develop through enterprising activities [2](#).

Implementation in Different Educational Settings:

- The EntreComp framework has been integrated into education and training development in various countries, with a focus on supporting the development of entrepreneurial competences [4](#).
- It has been adapted into the EntreCompEdu model, which identifies the competencies educators need to promote entrepreneurial education in primary, secondary, and vocational settings [6](#).
- The framework has been utilized to evaluate challenge-based learning programs, demonstrating its usefulness in evaluating competence development and providing a benchmark for educators [7](#).

In conclusion, the EntreComp framework encompasses key competencies related to entrepreneurship and contributes to entrepreneurial education by providing a shared definition of entrepreneurship competence. It defines different levels of proficiency and has been implemented in various educational settings, supporting the development of entrepreneurial competences. However, it is important to note that while the framework has been widely recognized, there is a need for further support and guidance to promote its effective implementation [2](#) [4](#) [6](#).

[Show all 7 references](#) 📄

Figure 4: Display of Scopus AI's "Expanded summary" related to the Entrepreneurial Competency Framework (EntreComp).

Step 7: The seventh step involves researchers generating a "Concept map" to facilitate researchers understanding of the Entrepreneurial Competency (EntreComp) framework. This concept map serves as a visual tool that assists researchers in understanding and seeing the relationships between the various elements in the entrepreneurial framework. One of the unique and interesting features of the concept map provided by Scopus AI is its ability to provide access to more in-depth information where each link in the display can be clicked to get further explanations related to the topics displayed. This allows researchers to explore and dig into information in more detail, enriching their understanding of the Entrepreneurial Competency (EntreComp) framework. Figure 5 displays the results of the "Concept map" generated by Scopus AI.

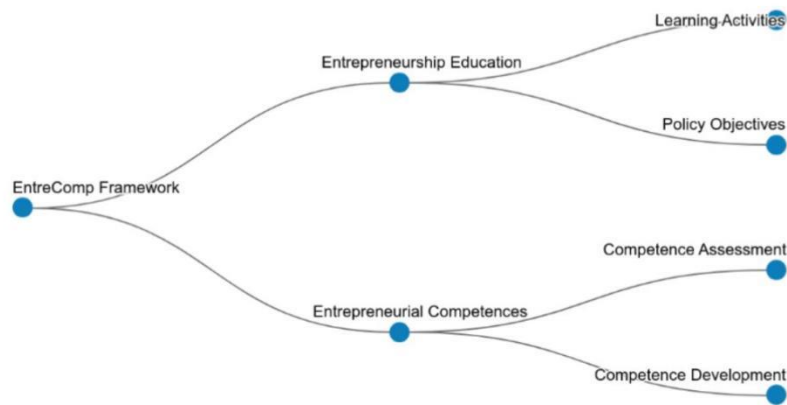


Figure 5: Display of Scopus AI's "Concept map" related to the Entrepreneurial Competency framework (EntreComp).

Step 8: The eighth step involves the researcher pressing the 'topic expert' button to understand and explore experts related to the field of study of the entrepreneurial framework. Through this step, researchers can access insights and information from experts who are experienced in the field, which can provide a more in-depth and relevant perspective on the research being conducted. This also helps researchers identify sources that can be referred to for more detailed knowledge in the field of entrepreneurship. Figure 6 is a presentation for "topic experts" proposed by Scopus AI.

Topic experts ^

Bosman, Lisa B. L.B.
 788 citations 22 matching documents 13 h-index
 Lisa B. Bosman is an expert in developing students' entrepreneurial mindset through evidence-based decision-making and cognitive apprenticeship approach. Their publications demonstrate a focus on incorporating entrepreneurial mindset into engineering education, promoting information literacy for cultivating the entrepreneurial mindset, and integrating the entrepreneurial mindset into the classroom.
[Preview profile](#)

Bodnar, Cheryl Anne C.A.
 475 citations 16 matching documents 9 h-index
 Cheryl Anne Bodnar is an expert in assessing and exploring the perceptions and development of entrepreneurial mindset among engineering students. Their research delves into the experiences shaping students' entrepreneurial mindset, examining frameworks for entrepreneurial mindset, and investigating faculty motivation for entrepreneurial mindset professional development.
[Preview profile](#)

Kecskemety, Krista M. K.M.
 264 citations 14 matching documents 9 h-index
 Krista M. Kecskemety is an expert in evaluating and mapping the entrepreneurial mindset within engineering education. Their work focuses on assessing students' perceptions and attributes related to entrepreneurial mindset in design projects, investigating the longitudinal development of entrepreneurial mindset among first-year engineering students, and integrating entrepreneurial mindset into industry-sponsored capstone projects.
[Preview profile](#)

Figure 6: Scopus AI's "Topic expert" display related to the Entrepreneurial Competency (EntreComp) framework

Go deeper

↳ What are the key competences outlined in the EntreComp framework?

↳ How does the EntreComp framework support entrepreneurial learning in education?

↳ What are the different levels of proficiency defined within the EntreComp framework?

Figure 7: Scopus AI "Go deeper" display related to the Entrepreneurial Competency framework (EntreComp)

Step 9: Finally, the ninth step involves the researcher selecting the "Go deeper" feature by pressing the relevant question button to explore more deeply. This step allows researchers to obtain more detailed and comprehensive answers on the topics under study, specifically in the context of the Entrepreneurial Competency (EntreComp) framework. This function makes it easier for researchers to obtain articles or materials related to the Entrepreneurial Competency framework (EntreComp). provide a more comprehensive understanding of the framework. This step is illustrated in Figure 7 for the Scopus AI "Go deeper" presentation.

The steps to find information using Scopus AI software are summarized as shown in figure 8 below:

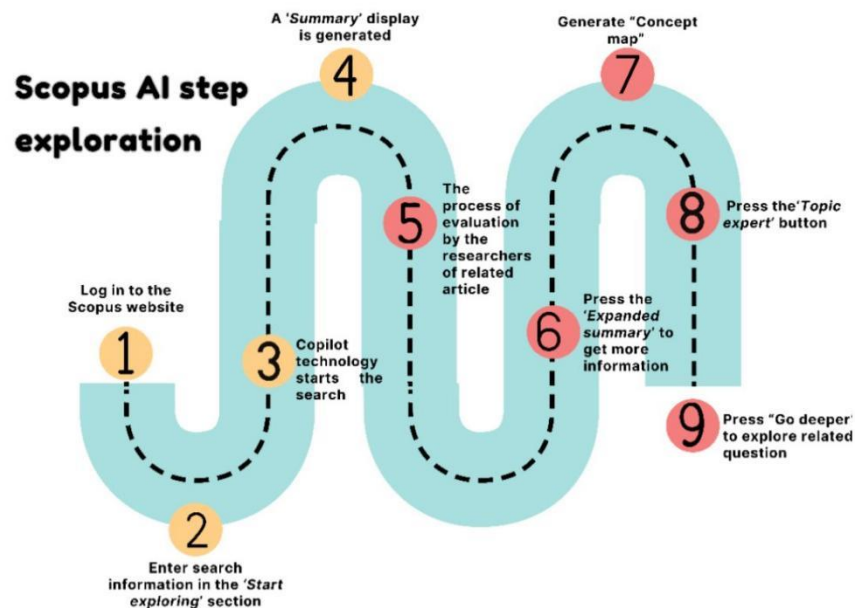


Figure 8: Information exploration steps using Scopus AI software

FINDINGS

The search results related to the EntreComp entrepreneurship framework are summarized in table 1 below. The table view is according to the elements available in Scopus AI followed by descriptions, references, and reference sources of the foundational documents for articles obtained in the Scopus database.

Table 1: Summary of the Entrepreneurial Competency Framework (EntreComp) exploration using Scopus AI

Scopus AI Elements	Information *The number at the end of the sentence represents a reference	Reference	Foundational documents
1. Summary	The framework covers four dimensions: Ideas and Opportunities, Personal Resources, Specialized Knowledge, and Action, and has been endorsed as a self-assessment tool for entrepreneurial competence. <u>1.</u>	<ul style="list-style-type: none"> Reference 1; 20 citations EntreComp Questionnaire: A Self-Assessment Tool for Entrepreneurship Competencies López-Núñez, M.I.; Rubio-Valdehita, S.; Armuña, C.; Pérez-Urria, E. Sustainability (Switzerland) 2022 	<p>1. Number of citations: 1,369 citations; Commonly cited by 3</p> <p>The relationship of entrepreneurial traits, skill, and motivation to subsequent venture growth</p> <p>Baum, J.R.; Locke, E.A.</p> <p>Journal of Applied Psychology 2004</p>
	Although developed at the request of the European Commission, the EntreComp framework has had limited impact and use in scientific production related to entrepreneurial skills and training. <u>3.</u>	<ul style="list-style-type: none"> Reference 3; 12 citations Entrecomp: Competent framework for entrepreneurship. A systematic review of the literature on its use and application Baena-Luna, P.; García-Río, E.; Monge-Agüero, M. Information Technological 2020 	<p>2. Number of citations: 33,860 citations; Commonly cited by 2</p> <p>Self-efficacy: Toward a unifying theory of behavioral change</p> <p>Bandura, A.</p> <p>Psychological Review 1977</p>
	A thorough study of entrepreneurial competencies confirms the strengths of EntreComp which are in line with the competencies identified in the literature, but also highlights some aspects related to psychological factors and context in current entrepreneurial practices. <u>2.</u>	<ul style="list-style-type: none"> Reference 2; 0 citations Revisiting EntreComp through a systematic literature review of entrepreneurial competences. Implications for entrepreneurship education and future research Bernadó, E.; Bratzke, F. International Journal of Management Education 2024 	<p>3. Number of citations: 2,204 citations; Commonly cited by 2</p> <p>Development and cross-cultural application of a specific instrument to measure entrepreneurial intentions</p> <p>Liñán, F.; Chen, Y.</p> <p>Entrepreneurship: Theory and Practice 2009</p>
	The framework has been widely recognized as an important driver in entrepreneurship education, yet the lack of a shared vision and the development of practices in its use can hinder its effective implementation. <u>4.</u>	<ul style="list-style-type: none"> Reference 4; 20 citations Eu policies driving entrepreneurial competences—reflections from the case of entrecomp Seikkula-Leino, J.; Salomaa, M.; Jónsdóttir, S.R.; Israel, H. Sustainability (Switzerland) 2021 	<p>4. Number of citations: 806 citations; Commonly cited by 2</p> <p>The competitiveness of small and medium enterprises: A conceptualization</p>

continued

Scopus AI Elements	Information *The number at the end of the sentence represents a reference	Reference	Foundational documents
			with focus on entrepreneurial competencies Man, T.W.Y.; Lau, T.L.M.; Chan, K.F. Journal of Business Venturing 2002
2. Expanded summary	<p>Main Components of the EntreComp Framework:</p> <ul style="list-style-type: none"> - The EntreComp framework was developed by the European Commission to analyse entrepreneurial orientation in training and learning plans in the European Union. <u>1.</u> - The framework emphasizes the process-oriented nature of entrepreneurship, which includes aspects from opportunity introduction to value creation. <u>2.</u> - This framework involves competencies related to psychological and contextual factors, as well as practical considerations in current entrepreneurial practice. <u>2.</u> 	<ul style="list-style-type: none"> • Reference 1; 12 citations • Entrecomp: Competent framework for entrepreneurship. A systematic review of the literature on its use and application • Baena-Luna, P.; García-Río, E.; Monge-Agüero, M.; • Information Technological • 2020 • Reference 2; 0 citations • Revisiting EntreComp through a systematic literature review of entrepreneurial competences. Implications for entrepreneurship education and future research • Bernadó, E.; Bratzke, F. • International Journal of Management Education • 2024 	
	<p>Contribution to Entrepreneurship Education:</p> <ul style="list-style-type: none"> - The framework was found to align with most of the competencies identified in the literature, providing insights for the development of effective educational programs. <u>2.</u> - Educational technologies, such as games and simulations, have been shown to have a positive impact on entrepreneurial competence, especially in areas such as financial & economic literacy, motivation & perseverance, and initiative taking. <u>3.</u> - The United Nations and the European Union consider entrepreneurial skills to be essential for creating economic 	<ul style="list-style-type: none"> • Reference 2; 0 citations • Revisiting EntreComp through a systematic literature review of entrepreneurial competences. Implications for entrepreneurship education and future research • Bernadó, E.; Bratzke, F. • International Journal of Management Education • 2024 • Reference 3; 1 citation • The impact of educational technologies on entrepreneurial competencies: A systematic review of empirical evidence • Hammoda, B. • Knowledge Management and E-Learning 	

continued

Scopus AI Elements	Information	Reference	Foundational documents
	<p>*The number at the end of the sentence represents a reference</p> <p>well-being and sustainability, and the EntreComp framework plays an important role in driving the development of entrepreneurial competencies in education and training. <u>4.</u></p>	<ul style="list-style-type: none"> • 2024 • Reference 4; 20 citations • Eu policies driving entrepreneurial competences—reflections from the case of entrecomp • Seikkula-Leino, J.; Salomaa, M.; Jónsdóttir, S.R.; Israel, H. • Sustainability (Switzerland) • 2021 	
	<p>Different Levels of Competence in the EntreComp Framework:</p> <p>- The EntreComp framework outlines three distinct areas of entrepreneurial competence, which are found to be <i>unidimensional</i> in nature and related to business start-up behavior, evolving through entrepreneurial activities. <u>5.</u></p>	<ul style="list-style-type: none"> • Reference 5; 11 citations • Testing the EntreComp framework and its relation to start-up behaviour in seven European countries • Joensuu-Salo, S.; Viljamaa, A.; Varamäki, E. • Journal of Small Business and Enterprise Development • 2022 	
	<p>Challenges in Implementing the EntreComp Framework in Education:</p> <p>- Although the EntreComp framework is widely recognized as an important driver of entrepreneurial education competencies, there is a lack of shared vision and practice development in its use, which can hinder effective implementation. <u>4.</u></p> <p>- Further support and guidance is needed to promote the learning process for policymakers, educators, trainees, and other stakeholders in educational design at the micro and macro levels, to support the adoption and adaptation of these policy-driven frameworks. <u>4.</u></p>	<ul style="list-style-type: none"> • Reference 4; 20 citations • Eu policies driving entrepreneurial competences—reflections from the case of entrecomp • Seikkula-Leino, J.; Salomaa, M.; Jónsdóttir, S.R.; Israel, H. • Sustainability (Switzerland) • 2021 	
3. <i>Concept map</i>	<p>Summary of Related Concept Paths:</p> <p>1. EntreComp Framework for → Entrepreneurial Competencies</p>	<ul style="list-style-type: none"> • Reference 1; 20 citations • EntreComp Questionnaire: A Self-Assessment Tool for Entrepreneurship Competencies • López-Núñez, M.I.; Rubio-Valdehita, S.; Armuña, C.; Pérez-Urria, E. 	

continued

Scopus AI Elements	Information *The number at the end of the sentence represents a reference	Reference	Foundational documents
	- The EntreComp framework provides a comprehensive description of the knowledge, skills, and attitudes required for an entrepreneurial mindset. <u>1, 2.</u>	<ul style="list-style-type: none"> • Sustainability (Switzerland) • 2022 • Reference 2; 7 citations • EntreComp Framework: A Bibliometric Review and Research Trends 	
	- The EntreComp framework has been used as a self-assessment tool, however there is a lack of instruments that cover the entire set of competencies proposed by EntreComp. <u>1.</u>	<ul style="list-style-type: none"> • Rațiu, A.; Maniu, I.; Pop, E.-L. • Sustainability (Switzerland) • 2023 • Reference 3; 0 citations • Design of a Social Innovation Competence Framework to Educate Entrepreneurs in Developing on the International Stage 	
	- A new questionnaire has been developed and validated to assess the validity and reliability of the evidence for self-assessment of entrepreneurial competencies within the framework of EntreComp. <u>1.</u>	<ul style="list-style-type: none"> • Yeratziotis, A.; Aadland, T.; Brandshaug, S.W.; Papadopoulos, G.A. • Innovation, Technology and Knowledge Management 	
	- The EntreComp framework has been used as the basis for the development of a social innovation competency framework, with a specific focus on the education of social entrepreneurs for internationalization efforts. <u>3.</u>	<ul style="list-style-type: none"> • 2022 • Reference 4; 0 citations • Revisiting EntreComp through a systematic literature review of entrepreneurial competences. Implications for entrepreneurship education and future research 	
	- A comprehensive study on entrepreneurial competencies confirms the robustness of the EntreComp framework, emphasizes alignment with the competencies identified in the literature as well as clarifies the precursor factors and developmental aspects of each competency. <u>4.</u>	<ul style="list-style-type: none"> • Bernadó, E.; Bratzke, F. • International Journal of Management Education • 2024 • Reference 5; 12 citations • Entrecomp: Competent framework for entrepreneurship. A systematic review of the literature on its use and application 	
	- The EntreComp framework is still underused in the production of scientific works related to entrepreneurial skills and its training, with limited impact in empirical and theoretical works. <u>5.</u>	<ul style="list-style-type: none"> • Baena-Luna, P.; García-Río, E.; Monge-Agüero, M.; • Information Technological • 2020 • Reference 6; 4 citations • Entrepreneurship competence in pre-service teachers training degrees at spanish jesuit universities: A content analysis based on entrecomp and entrecompedu 	
	- The involvement of entrepreneurial competencies, as considered in the EntreComp framework, into pre-service teacher training programs in Spanish universities has been analyzed, which shows varying		

continued

Scopus AI Elements	Information	Reference	Foundational documents
	<p>*The number at the end of the sentence represents a reference levels of competency coverage of these <u>frameworks</u>. <u>6</u>.</p> <p>- The EntreComp framework is widely recognized as a key driver in entrepreneurship education competencies, but the lack of a shared vision and development of practices in its use can hinder effective implementation. <u>7</u>.</p>	<ul style="list-style-type: none"> • Arruti, A.; Morales, C.; Benítez, E. • Sustainability (Switzerland) 2021 • Reference 7; 20 citations • Eu policies driving entrepreneurial competences—reflections from the case of entrecomp • Seikkula-Leino, J.; Salomaa, M.; Jónsdóttir, S.R.; Israel, H. • Sustainability (Switzerland) 2021 	
	<p>2. EntreComp Framework → for Entrepreneurship Education</p> <p>Skeleton</p> <p>- EntreComp: This framework is a key initiative by the European Commission to promote entrepreneurship education 1.</p> <p>It defines entrepreneurship as the creation of value, whether financially, culturally, or socially, and emphasizes its importance in all aspects of society 2.</p> <p>This framework outlines competencies from opportunity recognition to value creation, aligned with most of the competencies identified in literature 3.</p> <p>- Educational Adaptation: The EntreComp framework has been adapted into models such as EntreCom4ALL and EntreCompEdu to improve access to entrepreneurship education, especially for young or female entrepreneurs and educators^{1,4}. These models aim to develop educator competencies and provide access to open educational resources on entrepreneurship. ^{1,4} reviews</p> <p>- Assessment and Impact: The study has tested the suitability</p>	<ul style="list-style-type: none"> • Reference 1; 4 citations • EntreCom4ALL MODEL to sustain the entrepreneurship competence needs • Tovar, E.; Tabuenca, B.; Piedra, N. • IEEE Global Engineering Education Conference, EDUCON 2020 • Reference 2; 28 citations • A critical review of learning approaches for entrepreneurship education in a contemporary society • O'Brien, E.; Hamburg, I. • European Journal of Education 2019 • Reference 3; 0 citations • Revisiting EntreComp through a systematic literature review of entrepreneurial competences. Implications for entrepreneurship education and future research • Bernadó, E.; Bratzke, F. • International Journal of Management Education 2024 • Reference 4; 12 citations • EntreCompEdu, a professional development framework for entrepreneurial education • Grigg, R. • Education and Training 2021 • Reference 5; 16 citations 	

continued

Scopus AI Elements	Information	Reference	Foundational documents
	<p>*The number at the end of the sentence represents a reference of this framework in evaluating entrepreneurship courses and found it to be effective in measuring the development of entrepreneurial competencies, particularly in areas such as teamwork and experiential learning^{5,6}. However, there are challenges in the effective implementation of this framework, emphasizing the need for further support and guidance to stakeholders in education ⁷.</p> <p>Teacher Training: There is a higher demand for training in integrating entrepreneurial education in teaching practice, with a focus on practical references and models to define teaching actions ⁸. The EntreComp framework has been used to assess the impact of challenge-based learning programmes, demonstrating its usefulness in assessing competency development ⁶.</p>	<ul style="list-style-type: none"> • Using the EntreComp framework to evaluate two entrepreneurship education courses based on the Korda Method • Morselli, D.; Gorenc, J. • International Journal of Management Education • 2022 • Reference 6; 1 citation • Evaluating an interfaculty entrepreneurship program based on challenge-based learning through the EntreComp framework • Morselli, D.; Orzes, G. • International Journal of Management Education • 2023 • Reference 7; 20 citations • Eu policies driving entrepreneurial competences—reflections from the case of entrecomp • Seikkula-Leino, J.; Salomaa, M.; Jónsdóttir, S.R.; Israel, H. • Sustainability (Switzerland) • 2021 • Reference 8; 6 citations • Education for entrepreneurship in secondary education: Teachers' opinions about the current state and future possibilities in European contexts • Prendes Espinosa, M.P.; Solano Fernández, I.M.; González Martínez, J.; Cerdán Cartagena, F. • Bordon. Revista de Pedagogia • 2020 	
4. Topic expert	<ul style="list-style-type: none"> • Lisa B. Bosman <p>788 citations, 22 matching documents, 13 h-index</p> <p>Lisa B. Bosman is an expert in developing students' entrepreneurial minds through evidence-based decision-making and a cognitive internship approach. His publications show a focus on integrating an</p>		

continued

Scopus AI Elements	Information	Reference	Foundational documents
	<p>*The number at the end of the sentence represents a reference entrepreneurial mindset into engineering education, promoting information literacy to foster an entrepreneurial mindset, as well as incorporating these elements into the classroom.</p> <p>● Cheryl Anne Bodnar 475 citations, 16 matching documents, 9 h-index</p> <p>Cheryl Anne Bodnar is an expert in assessing and exploring the perception and development of an entrepreneurial mindset among engineering students. His work includes assessing the perception of an entrepreneurial mindset through concept maps, exploring the experiences that shape students' entrepreneurial mindsets, and reviewing the KEEN 3Cs framework using content analysis and expert review.</p> <p>● Krista M. Kecskemety 264 citations, 14 matching documents, 9 h-index</p> <p>Krista M. Kecskemety is an expert in evaluating and mapping entrepreneurial mindsets in engineering education. His research focuses on mapping the concept of entrepreneurial mindset in first-year engineering design courses, studying the entrepreneurial mindset of first-year engineering students longitudinally, as well as evaluating the traits of students' entrepreneurial mindset in design projects.</p>		
5. Go deeper	<p>● What are the main competencies outlined in the EntreComp framework? The main competencies outlined in the EntreComp Framework include 1,2: 1. Ideas and Opportunities: Focus on the ability to identify</p>	<p>● Reference 1; 20 citations</p> <p>● EntreComp Questionnaire: A Self-Assessment Tool for Entrepreneurship Competencies</p> <p>● López-Núñez, M.I.; Rubio-Valdehita, S.; Armuña, C.; Pérez-Urria, E.</p> <p>● Sustainability (Switzerland)</p> <p>● 2022</p>	<p>1. Number of citations: 57 citations; Commonly cited by 5</p> <p>From stand-up to start-up: exploring entrepreneurship competences and STEM women's intention</p>

continued

Scopus AI Elements	Information	Reference	Foundational documents
	<p>*The number at the end of the sentence represents a reference</p> <p>and develop opportunities to create economic or social value.</p> <p>2. Personal Resources: Involves the capacity to mobilize resources to realize ideas as well as manage personal and professional development.</p> <p>3. Specialized Knowledge: Covers the mastery of knowledge about business and entrepreneurship, including financial and economic literacy.</p> <p>4. Acting: Refers to the ability to turn an idea into action, defend, and manage the risks involved in the implementation of an idea.</p> <p>Additionally, the framework emphasizes the importance of soft skills such as emotional intelligence, resilience, and perseverance for entrepreneurs</p> <p>2. The EntreComp framework was used to evaluate entrepreneurship courses and was found to be suitable for student-centered pedagogy 3. It is also used to assess the level of entrepreneurial competence among students, which shows differences in competencies based on gender, material status, and professional situation 4.</p>	<ul style="list-style-type: none"> • Reference 2; 6 citations • The Relevance of Soft Skills for Entrepreneurs • Almeida, F.; Devedzic, V. • Journal of East European Management Studies • 2022 • Reference 3; 16 citations • Using the EntreComp framework to evaluate two entrepreneurship education courses based on the Korda Method • Morselli, D.; Gorenc, J. • International Journal of Management Education • 2022 • Reference 4; 7 citations • Data mining in entrepreneurial competencies diagnosis • Czyzewska, M.; Mroczek, T. • Education Sciences • 2020 	<p>Armuña, C.; Ramos, S.; Juan Ruiz, J.; Arenal, A.</p> <p>International Entrepreneurship and Management 2020</p> <p>2. Number of citations:26 citations; Commonly cited by 4</p> <p>Entrepreneurial Competences: Comparing and Contrasting Models and Taxonomies</p> <p>Gianesini, G.; Cubico, S.; Favretto, G.; Leitão, J.C.C.</p> <p>3. Number of citations:20 citations; Commonly cited by 4</p> <p>Eu policies driving entrepreneurial competences—reflections from the case of entrecomp</p> <p>Seikkula-Leino, J.; Salomaa, M.; Jónsdóttir, S.R.; Israel, H.</p> <p>Sustainability (Switzerland) 2021</p> <p>4. Number of citations:20 citations; Commonly cited by 4</p> <p>EntreComp Questionnaire: A Self-Assessment Tool for Entrepreneurship Competencies</p> <p>López-Núñez, M.I.; Rubio-Valdehita, S.; Armuña, C.; Pérez-Urría, E.Á.</p> <p>Sustainability (Switzerland) 2022</p> <p>5. Number of citations:7 citations; Commonly cited by 4</p>

continued

Scopus AI Elements	Information *The number at the end of the sentence represents a reference	Reference	Foundational documents
			Data mining in entrepreneurial competencies diagnosis Czyżewska, M.; Mroczek, T. 2020
	<ul style="list-style-type: none"> • How does the EntreComp framework support entrepreneurial learning in education? <p>Key Elements of EntreComp: EntreComp Framework: Published by the European Commission, this framework aims to develop a similar conceptual approach to support the development of entrepreneurship education.1 Diverse Competencies: This framework identifies a variety of competency areas, including entrepreneurial knowledge and understanding, planning and organization, teaching and training, assessment, as well as professional learning.2 Emphasis on Collaboration: This framework emphasizes the importance of collaboration and offers educators a structure and guidance to develop their competencies.2,3</p> <p>Implementation and Impact: EntreCom4All Model: As an adaptation of the EntreComp framework, this model targets young or female entrepreneurs as well as entrepreneurship educators, aiming to improve the accessibility of entrepreneurship education through an online platform with Open Educational Resources (OER) on entrepreneurship. 1 Additional Support Needs: However, there is a need for further support and guidance to promote the effective implementation of this framework, as the lack of shared vision and practice development in the use of</p>	<ul style="list-style-type: none"> • Reference 1; 4 citations • EntreCom4ALL MODEL to sustain the entrepreneurship competence needs • Tovar, E.; Tabuenca, B.; Piedra, N. • IEEE Global Engineering Education Conference, EDUCON • 2020 • Reference 2; 12 citations • EntreCompEdu, a professional development framework for entrepreneurial education • Grigg, R. • Education and Training • 2021 • Reference 3; 20 citations • Eu policies driving entrepreneurial competences—reflections from the case of entrecomp • Seikkula-Leino, J.; Salomaa, M.; Jónsdóttir, S.R.; Israel, H. • Sustainability (Switzerland) • 2021 	<p>1. Number of citations:149 citations; Commonly cited by 4 A systematic literature review of the evolution of pedagogy in entrepreneurial education research Hägg, G.; Gabrielsson, J. International Journal of Entrepreneurial Behaviour & Research 2020</p> <p>2. Number of citations:111 citations; Commonly cited by 4 Teachers implementing entrepreneurship education: Classroom practices Ruskovaara, E.;Pihkala, T. Education + Training 2013</p> <p>3. Number of citations:57 citations; Commonly cited by 4 From stand-up to start-up: exploring entrepreneurship competences and STEM women's intention Armuña, C.; Ramos, S.; Juan Ruiz, J.; Arenal, A. International Entrepreneurship and Management Journal 2020</p>

continued

Scopus AI Elements	Information	Reference	Foundational documents
	<p>*The number at the end of the sentence represents a reference</p> <p>EntreComp may hinder its adoption. 3</p> <p>Educator Training and Development: EntreCompEdu: This professional development framework provides training materials and a support network for educators to enhance their competencies, in line with the professional development needs of teachers in entrepreneurship education. 2</p> <p>Demand for Training: Teachers expressed a demand for additional practical training and references to include entrepreneurship education in their teaching practices, emphasizing the importance of ongoing support and resources for educators. 3</p>		<p>4. Number of citations:39 citations; Commonly cited by 4 A review of entrepreneurship education in teacher education Deveci, İ.; Seikkula-Leino, J. Malaysian Journal of Learning and Instruction 2018</p> <p>5. Number of citations:18 citations Commonly cited by 4 Articulating entrepreneurial competencies in the undergraduate curricular Dinning, T. Education + Training 2019</p>
	<ul style="list-style-type: none"> • What skill levels are defined in the EntreComp framework? The EntreComp framework defines three skill levels that cover a wide range of knowledge, skills, and attitudes required for an entrepreneurial mindset 1,2. Here is a breakdown of those proficiency levels 1,2: Ideas and Opportunities: Focuses on the ability to identify and develop opportunities to create economic or social value. Resources: Involves the capacity to mobilize and manage the resources needed to realize entrepreneurial ideas. Acting: Refers to the ability to turn ideas into actions, overcome challenges, and manage risks in the execution of ideas. Skill Level: The skill levels in this framework are unidimensional and relate to starting behaviours, role 	<ul style="list-style-type: none"> • Reference 1; 20 citations • EntreComp Questionnaire: A Self-Assessment Tool for Entrepreneurship Competencies • López-Núñez, M.I.; Rubio-Valdehita, S.; Armuña, C.; Pérez-Urria, E. • Sustainability (Switzerland) • 2022 • Reference 2; 11 citations • Testing the EntreComp framework and its relation to start-up behaviour in seven European countries • Joensuu-Salo, S.; Viljamaa, A.; Varamäki, E. • Journal of Small Business and Enterprise Development • 2022 • Reference 3; 12 citations • Entrecomp: Competent framework for entrepreneurship. A systematic review of the literature on its use and application • Baena-Luna, P.; García-Río, E.; Monge-Agüero, M. • 2020 	<p>1. Number of citations:18 citations; Commonly cited by 5 Articulating entrepreneurial competencies in the undergraduate curricular Dinning, T. Education + Training 2019</p> <p>2. Number of citations:57 citations; Commonly cited by 4 From stand-up to start-up: exploring entrepreneurship competences and STEM women's intention Armuña, C. Ramos, S. Juan Ruiz, J. Arenal, A. International Entrepreneurship and Management Journal 2020</p>

continued

Scopus AI Elements	Information	Reference	Foundational documents
	<p>*The number at the end of the sentence represents a reference</p> <p>models, and previous entrepreneurial experience 2.</p> <p>Gender and level of education did not show a significant effect on skill level.2</p> <p>Usage and Impact: This framework has been used as a self-assessment tool, but there is limited use and impact observed in empirical and theoretical work 3,4. Nevertheless, the framework is recognized as a key driver in entrepreneurship education, particularly in the context of social entrepreneurship and internationalization efforts 5,6. This framework has also been used to evaluate entrepreneurship courses and demonstrate the potential in evaluating and comparing entrepreneurship education programmes 7.</p> <p>Further Support Requirements: There is a need for further support and guidance to promote the effective implementation of this framework in the development of education and training. Overall, although the EntreComp framework defines skill levels and has been used in a variety of contexts, its impact and use are still limited, and further support is needed for its effective implementation in education and training. 3,4,5,6</p>	<ul style="list-style-type: none"> • Reference 4; 7 citations • EntreComp Framework: A Bibliometric Review and Research Trends • Rațiu, A.; Maniu, I.; Pop, E.-L. • Sustainability (Switzerland) • 2023 • Reference 5; 0 citations • Design of a Social Innovation Competence Framework to Educate Entrepreneurs in Developing on the International Stage • Yeratziotis, A.; Aadland, T.; Brandshaug, S.W.; Papadopoulos, G.A. • Innovation, Technology and Knowledge Management • 2022 • Reference 3; 20 citations • Eu policies driving entrepreneurial competences—reflections from the case of entrecomp • Seikkula-Leino, J.; Salomaa, M.; Jónsdóttir, S.R.; Israel, H. • Sustainability (Switzerland) • 2021 • Reference 7; 16 citations • Using the EntreComp framework to evaluate two entrepreneurship education courses based on the Korda Method • Morselli, D.; Gorenc, J. • International Journal of Management Education • 2022 	<p>3. Number of citations:26 citations; Commonly cited by 3</p> <p>Entrepreneurial Competences: Comparing and Contrasting Models and Taxonomies</p> <p>Gianesini, G.; Cubico, S.; Favretto, G.; Leitão, J.C.C. (2018) Studies on Entrepreneurship, Structural Change and Industrial Dynamics, pp. 13 - 32, DOI: 10.1007/978-3-319-89336-5_2 Book chapter</p> <p>4. Number of citations:7 citations; Commonly cited by 3</p> <p>Data mining in entrepreneurial competencies diagnosis</p> <p>Czyżewska, M.; Mroczek, T. Education Sciences 2020</p>

DISCUSSION

Based on these findings, the researcher concluded that there are five main elements that function to facilitate the process of searching for information related to the Entrepreneurial Competency Framework (EntreComp) using Scopus AI. These elements are summary, expanded summary, concept map, topic expert, and go deeper. Figure 9 presents a summary of the findings of the main elements in the Scopus AI display.

Founded the researcher's experience using the summary function in Scopus AI, this function provides significant advantages in understanding the Entrepreneurial Competency

Framework (EntreComp) by offering a concise and detailed overview of relevant documents. This feature facilitates the identification of key studies, such as López-Núñez et al. (2022), which delineates EntreComp's core dimensions, as well as foundational studies like Baum and Locke (2004) and Bandura (1977), which reinforce the theoretical basis of the framework. Moreover, this function expedites the research process by highlighting recent studies such as Baena-Luna et al. (2020) and providing access to references related to entrepreneurial competencies, including those by Liñán and Chen (2009) and Man et al. (2002). With these summaries, the researcher can more efficiently understand theoretical and practical aspects of the EntreComp framework, reducing the time needed for in-depth analysis and facilitating effective study planning in entrepreneurship.

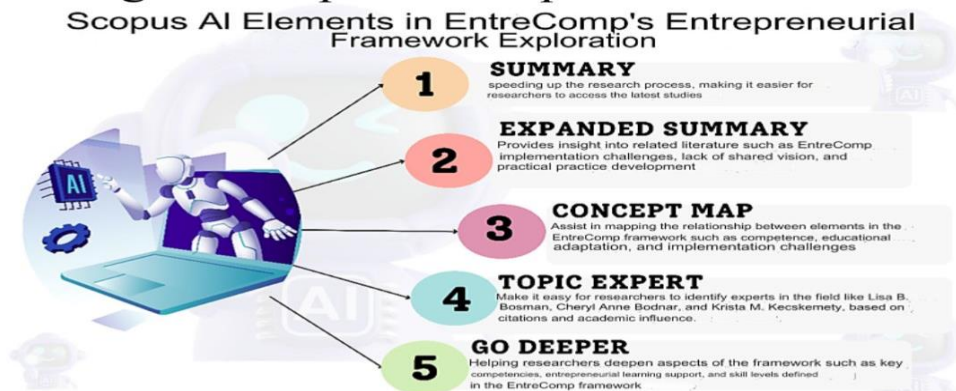


Figure 9: Scopus AI software elements

In addition, the researcher found the second element of Scopus AI, the "expanded summary," particularly useful in synthesizing findings related to the EntreComp framework. This expanded summary provides an in-depth and comprehensive view of relevant literature, enabling the researcher to understand better the dynamic and comprehensive aspects of the framework, such as opportunity recognition, value creation, and alignment with competencies identified in the literature. Furthermore, Scopus AI facilitates access to the latest information on educational technologies that enhance entrepreneurial skills, as well as helps identify implementation challenges, such as the need for a shared vision and the development of effective practices (Hammoda, 2024). However, based on information gathered through this search, the researcher discovered that certain challenges still need to be addressed in implementing the EntreComp framework, including the lack of a cohesive vision and obstacles in developing practical applications, impacting its effectiveness. Additional support and guidance are needed to ensure that policymakers, educators, and other stakeholders can more effectively implement entrepreneurship education. Using Scopus AI, the researcher noted that this tool provides detailed summaries and literature analyses, aiding in the identification and understanding of challenges associated with the EntreComp framework and assisting in planning more effective strategies to address them.

Additionally, a unique feature the researcher found compelling in Scopus AI is the "concept map" element. This tool proves effective in illustrating complex relationships between essential components within the EntreComp framework, such as entrepreneurial competencies, educational adaptation, and implementation challenges. Findings indicate that although EntreComp is considered comprehensive in identifying entrepreneurial knowledge, skills, and attitudes, studies reveal a lack of instruments covering the complete set of recommended competencies (López-Núñez et al., 2022). The researcher also found that the application of this framework in academia and empirical studies remains limited, especially in connecting it with practical entrepreneurship training (Baena-Luna et al., 2020). Moreover,

while the framework has been adapted into educational models such as EntreCom4ALL and EntreCompEdu to improve access to entrepreneurship education, primary challenges in its use include the lack of a shared vision and weaknesses in the development of practical applications, leading to less effective implementation (Grigg, 2021; Seikkula-Leino et al., 2021). This indicates that although EntreComp's potential is recognized as a vital driver in entrepreneurship education, these challenges require structured interventions to strengthen guidance and support for educators and institutions involved. In this context, the concept map assists not only in mapping out the structure of ideas but also in connecting theory and practice, particularly in identifying the suitability of this framework for experiential learning, teamwork, and the development of entrepreneurial competencies (Morselli & Gorenc, 2022).

Overall, the analysis results confirm that EntreComp is a robust framework, yet effective implementation requires enhanced collaboration among stakeholders. While it has been successfully tested in several entrepreneurship programs, this study also notes that to maximize the framework's impact on entrepreneurship education, continuous improvements warrant attention, particularly in self-assessment and instructional guidance (Morselli & Orzes, 2023). This is essential to ensure that EntreComp is not only a theoretical assessment tool but also a practical and relevant framework for use across various global educational contexts.

The fourth feature of Scopus AI, "Topic Expert," assists researchers in identifying experts in specific fields based on citation counts, matching documents, and h-index, indicating influence and impact within the academic community. According to study findings, Lisa B. Bosman, with 788 citations and an h-index of 13, is recognized for her contributions to integrating an entrepreneurial mindset into engineering education. Cheryl Anne Bodnar evaluates the perceptions and development of entrepreneurial mindsets among engineering students, while Krista M. Kecskemety focuses on mapping entrepreneurial mindsets in design projects. This feature simplifies researchers' efforts to locate relevant experts for literature review, collaboration, or reference in specific topics.

The final element assisting the researcher in exploring the EntreComp framework is the "Go Deeper" feature. In Scopus AI, this element functions as an essential tool for researchers, particularly postgraduate students, to delve into specific aspects of the EntreComp framework in greater detail. By leveraging this feature, researchers can explore pertinent questions deeply, such as key competencies within the EntreComp framework, defined skill levels, and how this framework supports entrepreneurship learning in education. The findings reveal that the "Go Deeper" display in Scopus AI automatically provides three main questions: (1) What are the core competencies outlined in the EntreComp framework? (2) How does the EntreComp framework support entrepreneurship learn in education? Moreover, (3) What skill levels are defined within the EntreComp framework?

The first question on core competencies in the EntreComp framework indicates that it covers several critical aspects, such as ideas and opportunities, personal resources, specific knowledge, and actions. Emphasis on ideas and opportunities requires individuals to identify and develop new possibilities that could create economic or social value (López-Núñez et al., 2022). Additionally, the ability to mobilize and manage resources and possess in-depth business and financial knowledge is crucial to realizing entrepreneurial ideas (Almeida & Devedzic, 2022). In terms of how the EntreComp framework supports entrepreneurship learning, it is seen through a well-defined and comprehensive pedagogical structure developed to empower educators in delivering effective entrepreneurship education (Seikkula-Leino et al., 2021). Models such as EntreCom4ALL and EntreCompEdu showcase practical adaptations of this framework in enhancing the accessibility of entrepreneurship education through online platforms and training materials (Tovar et al., 2020; Grigg, 2021). This highlights how the

framework not only outlines competencies but also provides practical tools and guidelines for teaching and learning.

Regarding defined skill levels, the EntreComp framework categorizes them into three levels: Ideas and Opportunities, Resources, and Taking Action, representing a spectrum of skills from opportunity recognition to implementation and risk management (Joensuu-Salo et al., 2022). While the framework offers a valuable self-assessment tool, there are reports of the need for further support to maximize its use and impact in educational contexts, considering certain limitations in its application (Rațiu et al., 2023). In summary, these findings illustrate how Scopus AI uses relevant questions to gain deeper insights into the EntreComp framework and provides valuable guidance in evaluating and enhancing its application within entrepreneurship education.

CONCLUSION

This study shows that the use of Artificial Intelligence (AI) technology through the Scopus AI application has a significant impact on facilitating postgraduate students' understanding of the Entrepreneurial Competency Framework (EntreComp). By applying an autoethnography approach, this study has identified five main elements in Scopus AI, namely summary, expanded summary, concept map, topic expert, and go deeper, which play an important role in facilitating the exploration and understanding of complex information. These elements enable students to access information more quickly and effectively, thus enhancing the quality of their learning process. The autoethnographic approach utilized in this study offers valuable insights by enabling a comprehensive and reflective evaluation of the researchers' personal experiences with Scopus AI. This method not only enriches the understanding of the impact of technology but also highlights the potential for personal growth and deeper engagement in the research process. This not only displays the practical steps of using this application but also provides useful guidance on how AI technology can be effectively integrated into educational practices. In this way, the autoethnography approach has enriched the understanding of the ways in which these technologies can support and improve the learning process. In terms of theoretical contribution, this study strengthens the understanding of the application of AI technology in enhancing the understanding of the EntreComp framework, providing a solid foundation for evaluating the effectiveness of technology in entrepreneurship education. The practical contribution of this study lies in the provision of useful guidance and strategies for educators in utilizing AI technology to empower entrepreneurial learning. Meanwhile, from the perspective of social contribution, the study also improves access to quality education, empowering students with essential skills for lifelong learning.

It is recommended that further exploration be undertaken regarding the application of AI technology for individuals with disabilities (OKU) to foster entrepreneurial competencies in the contemporary digital landscape. Based on the inputs obtained from the Entrepreneurial Competency Framework (EntreComp), the information can be adapted to meet the specific needs of this group and support the development of their entrepreneurial competencies. This will provide more inclusive and effective guidance, as well as provide a better understanding of the long-term impact of AI technology in enhancing the entrepreneurial skills of persons with disabilities and supporting their success in entrepreneurship.

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