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To cite this article: Essam Hussain Al-Lawati, Umar Haiyat Abdul Kohar & Ebi Shahrin Suleiman (2022) Entrepreneurial culture in educational institutions: A scoping review, Cogent Business & Management, 9:1, 1997237, DOI: [10.1080/23311975.2021.1997237](https://doi.org/10.1080/23311975.2021.1997237)

To link to this article: <https://doi.org/10.1080/23311975.2021.1997237>



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Published online: 10 Jan 2022.



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Received 3 April 2021  
Accepted 12 October 2021

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## MANAGEMENT | REVIEW ARTICLE

# Entrepreneurial culture in educational institutions: A scoping review

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**Abstract:** This study highlights the importance of entrepreneurial culture in educational institutions as an organization. This study emphasizes the relationship between entrepreneurial culture, entrepreneurship education, and entrepreneurial intention as study variables. This study highlights several aspects: the relationship between variables, study trend, contextual aspect like (country or educational institutions), population, publication type, and study design. A scoping review method is considered for this study based on both Scopus and Web of Science databases. The covered publications in the analyses were for the last 20 years ranging from the year 2003 till August 2021, with no limits on languages. After filtration, the eligible number of studies was (n = 94) out of 180 from both databases. The methodology part contains several sections based on the PRISM-ScR checklist. The findings show a significant relationship among the three variables with the possibility of entrepreneurial culture being a mediator between entrepreneurship education and entrepreneurial intention for future studies, which has not been tested yet. The highest publications were in 2015, especially by European Union countries, as studies in developed countries were more than developing and economies in transition countries. Quantitative studies were more than qualitative and mixed methods, as studies considered HEIs more than schools focusing on students and then teachers. To conclude, policymakers are encouraged to follow policies to improve entrepreneurial culture growth by promoting strategic cooperation among stakeholders and educational institutions implementing several concepts to enhance entrepreneurial culture. Future studies should validate and test these variables' relationships through a standard and accurate instrument.

## ABOUT THE AUTHORS



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**Subjects: Management; Social Sciences; Economics; Finance, Business & Industry; Business, Management and Accounting; Entrepreneurship and Small Business Management; Entrepreneurship; Organizational Studies; Management Education; Education; Education Policy & Politics; Educational Research; Higher Education; School Leadership; Management & Administration; Social Sciences; Education - Social Sciences; Arts & Humanities, Humanities, Cultural Studies**

**Keywords: Entrepreneurial culture; educational institution; entrepreneurship education; entrepreneurial intention; higher educational institutions; entrepreneurship; scoping review**

## 1. Introduction

Entrepreneurship is vital for a country's economic development, especially in reducing the unemployment rate by focusing on the self-employment of individuals (Singh & Pravesh, 2017). Many researchers suggested that one of the best solutions to reduce unemployment and stimulate economic growth is through entrepreneurship, mainly to increase self-employed individuals (Badri & Hachicha, 2019; Faisal Jabeen et al., 2017; Meyer & Surujlal, 2018). In addition, Jwara and Hoque (2018) proposed that business ideas and development in society are enhanced by entrepreneurship, whereby this scenario would develop entrepreneurial skills and knowledge and change individuals' mindsets by directing individual entrepreneurial intention (EI). In addition, Brownhilder Ngek Neneh (2019) suggested that EI predicts entrepreneurial behaviour, as it shows a proportion of action taken towards entrepreneurship by the individual. Iwu et al. (2019) highlighted several factors affecting EI by improving individual entrepreneurial thought, leading to creative thinking, especially entrepreneurship education (EE). However, according to the literature, the relationship between entrepreneurship education and entrepreneurial intention is inconsistent, which will be discussed later sections, highlighting the relationship between EE and EI as well as entrepreneurial culture (EC). Thus, Fayolle and Liñán (2014) suggested that there is a possibility of modifying and developing studies related to EI by having a mediator, moderator, or any new interactions (BarNir et al., 2011; Pollack et al., 2012).

Liñán (2004) stated that EE aimed at raising awareness of entrepreneurship as a profession, but this is not an indicator that the intention factor is concentrated. Moreover, having courses that look at educating start-ups would help to shape individual intention. Additionally, Nabi et al. (2017) declared that one of the essential results of EE is developing the country's economic growth, which will be by improving the knowledge, skills, and attitudes of the students. This development will lead to the establishment of more start-ups and create more jobs, which will help the country's economy. According to Ozaralli and Rivenburgh (2016), the intention is considered a planned behaviour by individuals that play a significant role in creating firms and businesses creation, as becoming an entrepreneur involves people making decisions about their career.

The change in individual mindsets to choose self-employment rather than being employed through the accumulation of entrepreneurial knowledge and skills evolves into developing entrepreneurial culture (EC) in educational institutions like higher education institutions (HEIs) and schools. However, according to Bakheet (2018), it is essential to look at how a country can improve and develop EC to have the needed and better attitude towards entrepreneurship, which would lead to set policies for developing students' skills. Furthermore, the implementation of EE would lead to having stable EC (Oo et al., 2018). Moreover, Kim and Kwon (2015) opined that relevant policies could foster the creation of EC at HEIs and public research organizations, which will lead to effective entrepreneurship activities at HEIs (Ahmad, 2015). Also, Liñán and Chen (2009) stated that more researches are needed regarding cross-cultures to know the impact of values and cultures on intention. Therefore, in this study, attention will be given to the organizational culture, especially addressing the EC of HEIs.

Therefore, this paper reviews entrepreneurship studies, particularly about EC in educational institutions that were previously conducted in this matter and addresses the possible role of EC in the relationship between EE and EI, which was not yet measured or tested to contribute new

knowledge to the field. This paper starts by highlighting research objectives and questions. Furthermore, the literature review section focused on selected variables such as EC, EI and EE , discussing them one by one , highlighting their relationships and proposing a research framework for future studies. Later, the methodology section is presented, using scoping review method whereby analysis was carried out on 94 articles from Scopus and the Web of Science database. Next, the result section presents study's main findings, followed by the discussion section. . Finally, the study conclusion and future research suggestions are presented in the final section.

### **1.1. Study objectives and questions**

There were five research objectives (RO) for this study: First, to identify the relationship between EE, EC, and EI . Second, to highlight the trend of analysed studies with regards to these variables' relationship. Third, to highlight the contextual aspect in terms of countries and types of educational institutions among analysed studies. Fourth, to draw attention to the population in these studies. Last is to highlight on the type of publication and study design in the analysed data. Therefore, the research questions (RQ) to be answered in this paper are as follows:

RQ1: Is there any relationship between EE, EC, and EI? (Concept)

RQ2: What is the trend of studies concerning these variables' relationships?

RQ3: Where do most of the studies take place in terms of contextual aspects and educational institutions? (Context)

RQ4: Who are engaged in these studies? (Participant/ Population)

RQ5: what are the most publication type and study designs highlighted?

The following sections will start with the concepts discussed in the literature. Next, the research method to conduct this study is highlighted regarding the analysed studies using scoping review method. Finally, the following sections would be discussion, conclusion, and future research .

## **2. Literature review**

### **2.1. Culture and entrepreneurship**

The culture was defined as “the values, beliefs and assumptions learned in early childhood that distinguishes one group of people from another” (Newman & Nollen, 1996, p. 754). Besides, Hayton et al. (2002) stated that the entrepreneurship behaviour of individuals is affected by the national culture, which is achieved and proven empirically by looking at national culture and entrepreneurs' characteristics. Shah et al. (2019) suggested that employees' behaviour and performance are influenced by organizational culture as this affects its implementation systems and procedures. According to Badri and Hachicha (2019), measuring entrepreneurship is done with the government's assistance, especially by having EC and promoting entrepreneurship. Moreover, culture is crucial for research studies, especially since this study's nature is more about an organization. One of the aspects that could be taken into consideration is the EC of the educational institutions. It is essential to notice that scholars have observed culture's impact on entrepreneurial behaviour. However, more studies are needed to be conducted on different organizational types and levels (Corporate, Industry,, Public, and others) , as well as different levels like (National, Regional and Global).

### **2.2. Entrepreneurial culture**

Fritsch and Wyrwich (2016, pp. 1–2) defined EC as “a culture of entrepreneurship can be understood as norms, values, and codes of conduct that promote social acceptance and approval of entrepreneurial activities resulting in high self-employment rates which persist over time.” . However, the studies about EC are still at the nascent stage, as more studies related to this topic are required (Wu & Destech Publicat, 2018). Moreover, F. Jabeen et al. (2019) proposed

that the academic need to give more attention to EC as a subject of interest in the field for several reasons, as it impacts employment, business continuity, and the economy's growth. Therefore, the country needs to encourage innovation, robust economic growth, and job creation (Aloulou, 2015; Susilaningsih, 2017).

Furthermore, several researchers like (Barbe et al., 2003; Capelleras et al., 2019) suggested that regions with high EC would encourage individuals with previous business experience to accelerate entrepreneurship activities through interaction between business owners and individuals, as well as formulation of encouraging policies by policymakers. The study of Capelleras et al. (2019) noted that strong EC represents in having individuals with previous experience in business and social role acceptance of entrepreneurship, in which and role models would affect the level of entrepreneurship activity in the country. Besides, few researchers (Aloulou, 2017; Rokhman & Ahamed, 2015) also suggested that government support plays a vital role in fostering EC at multiple levels. These findings demonstrate the importance of EC, as a weak EC can be a significant barrier towards entrepreneurial development in a specific country (Teresa Paiva & Tadeu, 2015). Faisal Jabeen et al. (2017) further strengthened the view by suggesting that economic development demands a long-term investment in entrepreneurship to create EC among youths. For example, in the European Union (EU) case, it was indicated by Sánchez-Hernández and Maldonado-Briegas (2019) that EE is vital for the development of EC through the introduction of relevant knowledge, skills, and mindsets to students. The following sections will look at other variables and the relationship between EE, EC and EI.

### **2.3. Entrepreneurial intention**

In general, EI is defined as “the quality that leads an individual to pursue a career in self-employment or establish his or her own business” (Espiritu-Olmos & Sastre-Castillo, 2015, p. 1595; Fayolle & Liñán, 2014). Also, Liñán and Santos (2007) mentioned that it is vital to focus on entrepreneurs' social situations and behaviour to maintain a robust and stable economy, particularly in developing countries. Besides, Linan (2008) highlighted that EI is an outcome of cognitive progress in entrepreneurial development, motivating individuals to consider entrepreneurship as a career through the mental process. Hence, it was found that EE is one of the elements that lead to EI, whereby the latter is significantly influenced by the former.

### **2.4. Entrepreneurship education**

Neck and Corbett (2018, p. 8) defined EE as “developing the mindset, skillset, and practice necessary for starting new ventures, yet acknowledging the outcomes of such education are far-reaching.” Furthermore, Naia et al. (2015) suggested that considerable attention is paid towards EE as a study discipline, where it could play a vital role in developing concepts and building theories. Moreover, Ustyuzhina et al. (2019) stated that developing students' entrepreneurial competencies and skills are vital, as more of a psychologically oriented aspect through EE, in which these competencies are beneficial for both entrepreneurs who have a business and potential entrepreneurs. Generally, EE has a positive effect on developing entrepreneurial mindsets among students, whereby focusing on developing their knowledge, attitude, and skills that lead to EC development (Vidal, et al., 2015; Sánchez-Hernández & Maldonado-Briegas, 2019). Besides, Jwara and Hoque (2018) indicated that entrepreneurial thinking and approaches are motivated by EE, which was noticeable among the youth enrolled in courses related to EE (Kapse et al., 2018). Also, Taye (2017) expressed that the country needs vigorous improvement in EE development to create more entrepreneurs and reduce the unemployment rate. However, the delivery of EE can be conducted through several educational ways such as courses and workshops during the semester in schools and HEIs, which may encourage the creation of innovative ideas by developing the mindset, knowledge, and skills of the students (Liñán & Santos, 2007; Nabi et al., 2017; O'Connor, 2013).

**Table 1. EE- EI relationships**

Type of studies	Authors
Significant	(Asghar et al., 2016; Bae et al., 2014; Barba-Sánchez & Atienza-Sahuquillo, 2018; Iwu et al., 2019; Lavelle, 2019; Liñán et al., 2011; X. Liu et al., 2019; Rauch & Hulsink, 2015)
Non-Significant	(Espiritu-Olmos & Sastre-Castillo, 2015; Galvão et al., 2018; Vukovic et al., 2015)
Mix relationship of EE-EI	(Fayolle & Gailly, 2015; Fayolle et al., 2006; Kassean et al., 2015; Nabi et al., 2017; Nabi et al., 2018; Nowiński et al., 2017)

### 2.5. Entrepreneurial intention and entrepreneurship education relationship

Nabi et al. (2017) highlighted that student attitudes and behaviours might be affected by EE, whereby EE can enhance the development of new ideas and encourage EI (Nabi et al., 2018). Table 1 indicates different aspects of relationships between EE and EI that should be considered, as several researchers in this field highlighted it. Moreover, researchers have identified different relationships between EI (outcome) and EE (predictor): significant and non-significant. Precisely, the finding demonstrates inconsistency in the relationship between the two variables, which should be further investigated with more variables. Hence, there is a chance that more studies will discover different relationships between EI and EE, as reported earlier by several researchers. Furthermore, several studies have reported exclusively on the mix finding relationship in terms of the relationship between EE and EI. Hence, this opens the door for more studies to be conducted with more variables addressing the relationship between EE and EI.

According to Iwu et al. (2019), EE could promote EI and cultivate entrepreneurial mindsets, leading to further entrepreneurial activities by inspiring innovation and creativity. Nabi et al. (2018) stated that EE courses might provide a more accurate picture of business opportunities and boost EI. In addition, Bae et al. (2014) proposed that EE—EI relationship was noticeable, as it has been observed that the outcome of EE- EI relationships are influenced by the research context. Nabi et al. (2017) suggested that EE courses might also influence students’ attitudes and behaviour, although this is unclear since it has both positive and negative effects. In some circumstances, EE may negatively affect EI, especially if EE causes a decline in EI level (Nabi et al., 2018). Kassean et al. (2015) highlighted that the relationship between EI and EE might be positive or negative depending on individual intention or self-efficacy; as a result, EE courses should be reviewed and developed regularly to work with the latest developments (Aranha et al., 2018). It was highlighted by Espiritu-Olmos and Sastre-Castillo (2015) that there is a negative relation between EI and education, as the findings imply that EI declines when an individual’s level of education increases, considering EE is part of the education activity. The following section will discuss the method used to conduct this research.

### 3. Research methodology

The selected studies were analysed to find the correlation between the three variables, as the literature criteria for inclusion and exclusion during the selection process are elaborated in Table 2. Furthermore, the period of studies was for the last 20 years, ranging from 2003 until August 2021. Therefore, the selection reveals that the analyses were conducted only based on relevant scholarly papers from the past 20 years. Documents published by scholars were classified as journal articles, conference papers and books (chapters). However, Mendeley, Endnote and Excel software’s were used to filter and remove duplicated of studies. As, several researchers in different areas have adopted scoping review as a method of study for their researches, such as (Arksey & O’Malley, 2005; Colquhoun et al., 2014; De Moraes et al., 2020; Dijkers, 2015; Khalil et al., 2020; Kha;il et al., 2021; Levac et al., 2010; Lockwood et al., 2019; Munn et al., 2018; Peters, Godfrey et al., 2020; Peters et al., 2015; Peters, Marnie et al., 2020; Pham et al., 2014; Tricco et al., 2016).

There was an interesting observation that scoping review studies are primarily conducted in the field of medicine and healthcare, in which the development of scoping review method was by several authors from the same field, such as (Collard et al., 2020; Covell et al., 2016; Hanneke et al., 2017;

**Table 2. Eligibility criteria of literature for inclusion and exclusion in scoping review**

Inclusion Criteria	Exclusion Criteria
<ul style="list-style-type: none"> <li>• Papers looking at the concepts and the relation(s) of EC-EI-EE</li> <li>• Papers focusing on students or teachers (Faculty)</li> <li>• Papers in educational initiations like HEIs and schools</li> <li>• Papers were looking in different countries around the world.</li> <li>• The search was on Title, abstract and Keywords in the Search database</li> <li>• Articles for the last 20 years, from the year 2003 to 2021</li> <li>• Papers indexed by Scopus or Web of Science</li> </ul>	<ul style="list-style-type: none"> <li>• Documents from other search engines</li> <li>• Studies do not answer and meet PCC elements</li> </ul>

Madlabana et al., 2020; Miller & Colquhoun, 2020; Pollock et al., 2020; Stevens et al., 2021). Adam et al. (2019) reported that scoping review is widely used in health-related research. However, few studies from non-health fields adopted scoping reviews, which signifies the need to have more studies in other fields to adopt scoping reviews. Moreover, in the field of technology and healthcare, there were scoping studies conducted by (Darmawan et al., 2020; Hasselgren et al., 2020). Precisely, there were several studies in the area of entrepreneurship used scoping review in their studies, for instance, (Biron & St-Jean, 2019; Burga & Rezanian, 2015; Chandra et al., 2020; Cubbon et al., 2020; Glasbeek, 2020; Rhaïem, 2018; Suryavanshi et al., 2019, 2020; Turpin & Shier, 2020), but this study is different by using Preferred Reporting Items for Systematic Review and Meta-Analyses extension for Scoping Review (PRISMA-ScR) as a guide for conducting this study. This paper looked at the mentioned studies that used scoping review method as most of these studies were selected from a noticeable research databases like Scopus and Web of Science databases as a sole reference.

### 3.1. Design

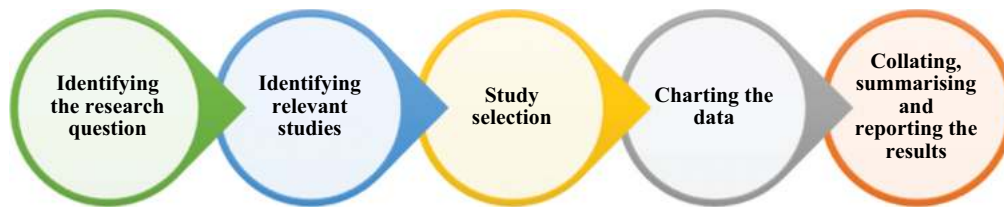
The scoping review focuses on examining the broader aspect of mapping relevant literature. This type of study helps to know and identify the main concepts, gaps, quantitative and qualitative data, time, and research contexts (Peters et al., 2015). Munn et al. (2018) stated that scoping review helps researchers to study unspecific relationships for observation and consideration before conducting a systematic review. Additionally, Colquhoun et al. (2014, p. 5) defined scoping review as it “addresses an exploratory research question aimed at mapping key concepts, types of evidence, and gaps in research related to a defined area.” In short, researchers find scoping review as a tool to address primary research done on a specific topic or field, which allows for identifying the study’s key concepts, theories, and contextual aspects. Tricco et al. (2016) viewed scoping review as a tool to identify the gaps and connect the different aspects of research regardless of the quality of the publication, which can help researchers to identify relevant topics for future research. Figure 1 shows the process of scoping review developed by Arksey and O’Malley (2005), like identifying the research questions, identifying relevant studies, study selection, charting data, and finally collecting, summarising and reporting the results.

This study was conducted by following the updated reporting tool used in scoping review called PRISMA-ScR in Appendix C, which refers to the Preferred Reporting Items for Systematic Review and Meta-Analyses extension for Scoping Review by the Joanna Briggs Institute (JBI) group and other scholars like (Peters, Marnie et al., 2020; Tricco et al., 2018). Besides, McGowan et al. (2020) recommended and highlighted the importance of using PRISMA-ScR to improve the scoping review in terms of clarity and consistency. Scoping review could be presented with diagrams, tables and figures to make it more visual and easier to understand. Furthermore, Miller and Colquhoun (2020) highlighted that scholars conducting scoping reviews are encouraged to use PRISMA-ScR as an efficient method for the systematic reflection of their studies.

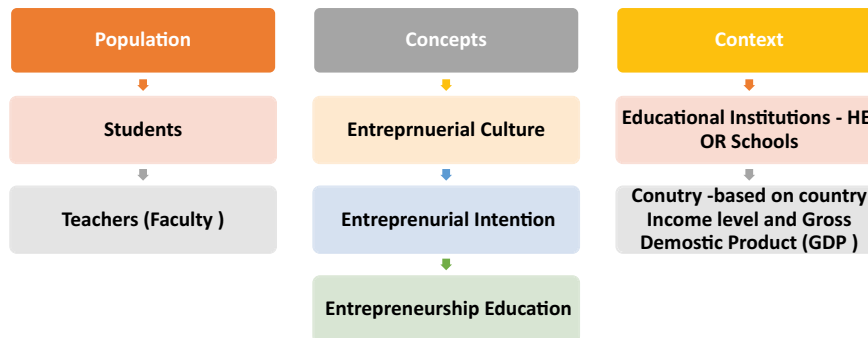


**Figure 1. The scoping review process.**

Source: Arksey and O'Malley (2005)



**Figure 2. PCC framework.**



### 3.2. Eligibility criteria (Inclusion and exclusion)

Figure 2 illustrates the PCC framework for this study which refers to Participants/ Population, Concept and Context, that was recommended by JBI for scoping review studies. Other scoping review papers used the same framework for better eligibility criteria (Inclusion/Exclusion) to meet study questions and objectives, as well as direct the search strategy (Peters, Godfrey et al., 2020).

Ninety-four related studies were chosen for analysis based on the eligibility criteria shown in Table 2, considering different research approaches like (Qualitative, Quantitative and Mix-method) in the analysed studies. The number of studies focusing on the relationship between EE, EC, and EI was few, making the potential for more research highlighting the possible role of EC, in which more studies are needed in this aspect. Based on the search analysis, the starting year was 2003 till August 2021. Different databases were used, like Scopus and Web of Science for searching. Moreover, the chosen language was English, as it is a common and understandable language between authors. On the other hand, the two exclusion criteria were regarding other search engines and studies that do not match the PCC framework. Finally, there was no restriction on the publication language of the analysed studies, as the translation tool was used through the suggester translation option to English using both Microsoft Office and Google.

### 3.3. Information source

J. Zhu and Liu (2020) noted that Web of Science by Clarivate and Scopus by Elsevier are two global and competing databases for references, especially in the academic area. The selected studies for analysis were from Scopus and Web of Science databases, as these databases are considered the most extensive databases. According to Aghaei Chadegani et al. (2013), Scopus and Web of Science tend to be the two most robust databases for scientific publications. Apart from reviewing the literature, these two databases were used to evaluate journals based on their efficiency and overall citations to determine their impact, reputation, and effect. Moreover, Ahmar et al. (2018) suggested that Scopus is considered the most comprehensive abstract database of scientific journals, conference proceedings and books. Scopus database contains researches from different fields and disciplines like engineering, science, social, medical, artistic and humanities publications. Furthermore, Li et al. (2018) noted that Web of Science (WOS) provided by Clarivate Analytics would be the world's leading research and analytical information

platform for scientific citations. It is considered as a research tool for providing a broad range of scientific activities through various fields of knowledge and as a dataset for comprehensive data studies. For the last 20 years, WOS has been used in thousands of published university studies and publications.

### 3.4. Search

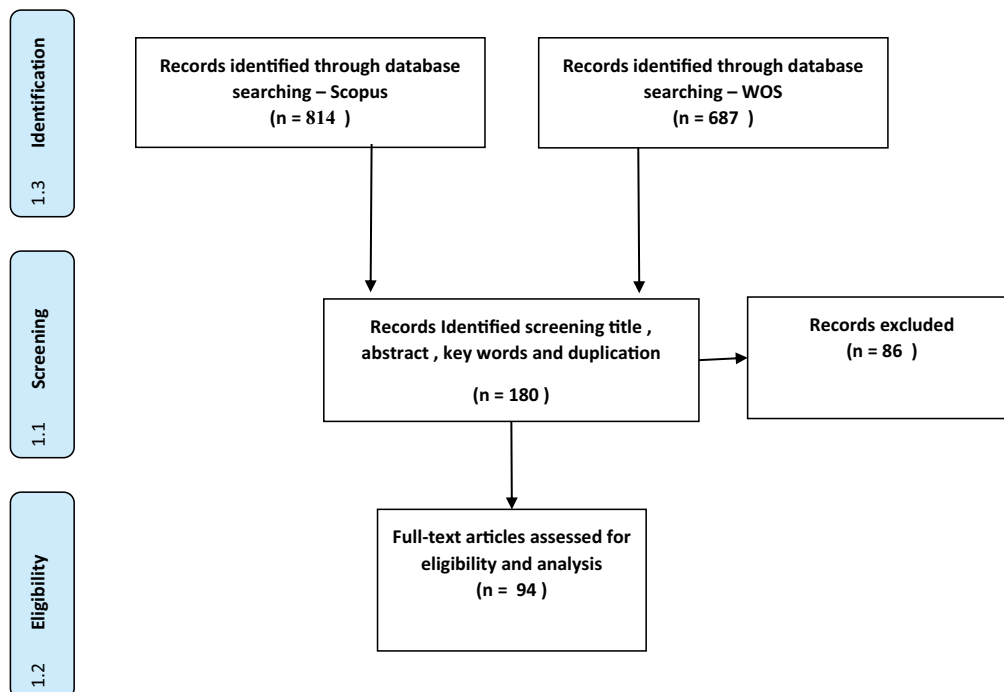
The search strategy was conducted by searching for relevant studies using Scopus and Web of Science databases. These databases have a wide range of studies related to social, management, and social studies. There was a use of different keywords, like the following: “entrepreneurial culture”, “entrepreneurial intention”, and “entrepreneurship education”. All the selected literature were transferred to Mendeley, Endnote and Excel software to remove the duplication after filtration and final selection. The selected studies varied in literature types, like published articles , conference papers or proceedings and book (chapters). The investigation focused on the title, abstract and keywords, observing the above keywords, topics and field of study. Besides, the reference list contains sources used in this study analysis and other supporting aspects. Appendix B shows the search strategy in different databases used for this review study. Besides, the combination of three words merged together for logical operators like the following:

TITLE-ABS-KEY (“entrepreneur\* culture”), TITLE-ABS-KEY (“entrepreneurial culture”), TITLE-ABS-KEY (“entrepreneurial culture” AND ”entrepreneurship education”),TITLE-ABS-KEY(“entrepreneurial culture” AND ”entrepreneurial intention”), culture” AND ”entrepreneurship education” AND ”entrepreneurial intention”).

### 3.5. Selection of source of evidence

The study of Khatib et al. (2021) illustrated that the study selection flowchart could be somehow taken from the PRISMA flow diagram with some editing. Hence the flow chart of literature searching used in this study was illustrated in Figure 3, which describes the study selection process involved in leading search strings that include EE, EC, and EI variables. The search was restricted to studies published between the years 2003 and 2021 based on the publication year. Hence, the

Figure 3. Flow chart for searching literature.



results yielded having 94 relevant documents from both Scopus and Web of Science for analysis after filtering for duplicated papers using Mendeley, Endnote and Excel software. This study is based on teamwork; in the case of any raised disagreement, it would be solved by discussion and cooperation between authors.

Moreover, the scoping review process is shown in Figure 4 as proposed by Arksey and O'Malley (2005), which starts with identifying research questions and relevant studies, followed by study selection and charting data; the final part involves collecting, summarizing, and reporting the results.

### 3.6. Data extraction and charting (Items)

Data charting was done based on the authors' extraction tool by analysing papers from different perspectives, like the author(s), year of publication, study title, publication type, publication source, study design, keywords, study population, country, and Context (educational institution), as the table (A1) in Appendix A provides details about the analysed studies containing the analysis of (EC-EE), (EC-EI) and (EC-EE-EI) relationship.

### 3.7. Synthesis of results

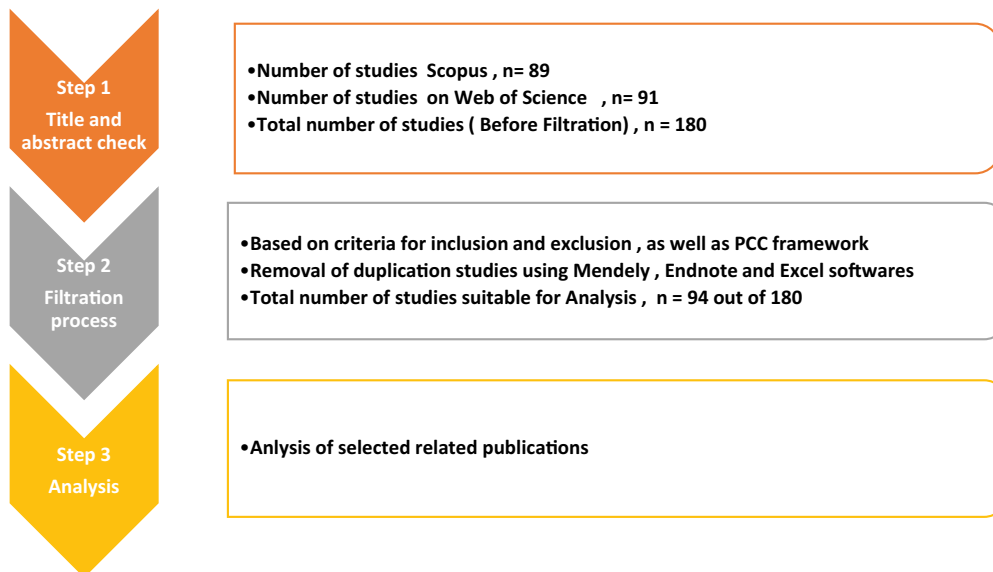
Table (A1) in Appendix A present the extracted data, as PRISMA-ScR was used as a reporting guideline. The analysed studies were allocated and categorised based on the relationship between the variables. Different research designs were highlighted, such as (Quantitative, qualitative or mixed-method) and the context of study represented in educational institutions mainly was either HEI or school. The data will highlight research objectives and questions. Furthermore, the result analysis section starts with highlighting the studies discussing different variables and concepts. Later it would look at the trend of studies followed by the analysis among journals and publishers. Finally, the contextual aspect is addressed and analysed.

## 4. Results

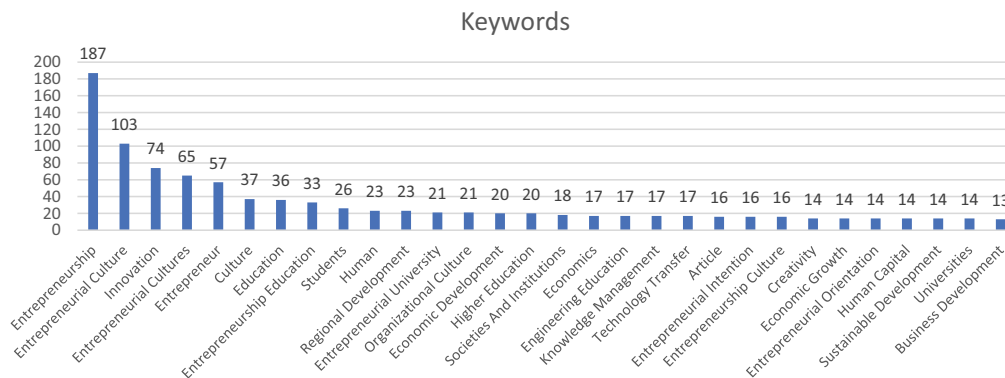
The selected papers were 94 out of 180 after removing the duplicated studies. The analysis of the results is based on highlighting research objectives and questions. Moreover, the approach used to review the title, abstract, and keywords in the databases depending on the criteria of eligibility (inclusion and exclusion). The highlighted studies were from the year 2003 till 2021. Based on the search conducted using Scopus and Web of Science databases as an example to show search strategy, Appendix B illustrates the title of searched keywords and the number of sources found.

**Figure 4. The process of study selection.**

Source: Authors' Analysis



**Figure 5. Main keywords for based on Scopus database using (TITLE-ABS-KEY("entrepreneur\* Culture")).**



However, the below figure shows the main keywords from Scopus search databases, as number of these main words are elaborated in this study. The search was for the “entrepreneur\* Culture” in Figure 5.

Moreover, three types of study design are noticed from most to least, starting with quantitative, qualitative and mix-method research approaches. In general, the table contained a section of (EC-EE) and (EC-EI) relationship analysis, as the analysis of (EC-EE-EI) included some studies from previous sections. Hence, studies with the symbol of (\*\*\*) indicate that a specific study is available in both (EC-EI) and (EC-EE-EI) sections to avoid replication.

#### 4.1. Relationship between the concepts

To answer RQ1, Table 1 in Appendix A presents the review analysis of the number of studies conducted to examine the relationship between the three variables. These key findings are summarized as follows: (a) majority of the studies highlighted the relationship between EE and EC; (b) the second high rank amount of studies indicated the relationship between EC and EI; (c) the least number of studies were conducted to emphasize the relationship between EC, EE and EI.

##### 4.1.1. Entrepreneurship education and entrepreneurial culture relationship

Policymakers need to focus on improving public policies and EE focusing on the issue of youth unemployment and EC development (Carayannis et al., 2003; Langer et al., 2016; Mukhtar & Redman, 2015). In this regard, Lindh and Thorgren (2016) proposed that developing policies regarding local businesses and EE may promote EC that can boost local economic growth by fostering individual entrepreneurial mindset through increasing their entrepreneurial knowledge and business opportunities. Furthermore, EC is constructed based on EE, in which its function can be fitted into the existing model of EE (Carvalho et al., 2015; Minaipoor & Kanani, 2013). According to Rogers and Hewson (2016), implementing EC at schools may be done by introducing guidelines and reshaping government policies towards implementing EC in schools.

Susilaningsih (2017) stated that to develop an academic culture, HEIs should introduce entrepreneurial learning that helps in building and creating the culture throughout the nation. Hence, cooperation between students, non-academic staff, and academics at HEIs are crucial in developing EC (Anuar et al., 2013; Jwara & Hoque, 2018; Kapse et al., 2018). However, the development of impactful courses and curriculum has been particularly challenging at HEIs, hampers EC’s creation and cultivation among students (Aloulou, 2017). Therefore, it will be necessary for HEIs to develop an awareness program to cultivate EC.

EE helps to change the mindsets and mentalities in society and fosters the creation of EC (Paço et al., 2017; Peterka et al., 2015). Moreover, strategic collaboration between government agencies and HEIs should strengthen the policies and cultivate EC among students (Anuar et al., 2013; Carvalho et al., 2015; Gao, 2014; Kirby & Ibrahim, 2011). Therefore, Khalil (2015) proposed that

research universities should significantly promote EC creation and growth nationwide. In line with this view, many researchers proposed that there is a need to have comprehensive and robust EE in HEIs to encourage the development of EC among the students (Aloulou, 2015; Kirby & Ibrahim, 2011; Sajjad & J, 2019; Sánchez Cañizares & Fuentes García, 2010). According to Nwokolo et al. (2017), EE has a significant relationship with EC. The other aspect that will be highlighted in the next section is the relationship between EC and EI.

#### 4.1.2. *Entrepreneurial culture and entrepreneurial intention relationship*

Stuetzer et al. (2014) demonstrated that EC affects EI positively by enhancing individuals to think about new ideas and start their businesses. The view demonstrates the positive effect of EI on EC when supported with other relevant initiatives and action plans. In addition, Musetsho and Lethoko (2017) suggested that bridging EC and EI will positively impact the economy, policymakers, and academics, eventually leading to self-employment. Moreover, many researchers believe that the country needs to promote EC to bring out the value of entrepreneurship in the educational system (Capelleras et al., 2019).

Meyer and Surujlal (2018) opined that the readiness to take on entrepreneurship activities depends on the institution's entrepreneurial culture. Thus, it is essential to establish a strategic relationship between academics, students, and various university divisions to transform and develop youth's entrepreneurial mindsets at university. Also, creating ideal curricula for students and lecturers is crucial to enhance entrepreneurial thinking (Jwara & Hoque, 2018). Furthermore, Wu and Destech Publicat (2018) noted that EC has a non-significant relationship with EI. On the other hand, Wibowo et al. (2020) found that EC has a significant relationship with EI. Hence, the next step discusses EC's position between EE and EI by looking at the reviewed studies.

#### 4.1.3. *Entrepreneurial culture, entrepreneurship education and entrepreneurial intention*

The total number of analysed studies was ( $n = 94$ ), looking at the relationship between the three variables'. The studies show that there is a relationship between EE-EC and EC -EI. Moreover, X. H. X. H. Zhu and Zhang (2018) studied the relationship of EC as a moderator between EE and EI. Hence, based on the other studies, there might be potential to study EC another role between EE and EI, which is discussed in the discussion sections. According to Kirui (2019), having low EC could negatively affect students' skills and knowledge. On the other hand, Karimi et al. (2010) suggested that EE helps in extending EC and innovation by introducing necessary changes in students' mindsets and skills. It was also found that the development of EC has a positive effect on individual perception and intention towards entrepreneurship, which encourages business and the creation of a new venture. Recently, studies discussed the relationship of EE, EC, EI by several authors like (Mukhtar et al., 2021; Wardana et al., 2021), in which EE was the mediator between EC and EI. However, Wardana et al. (2021) suggested that there is a lack of studies looking at the influence of EE on EC, in which this study proposed this aspect for testing.

#### 4.2. *Publication trend*

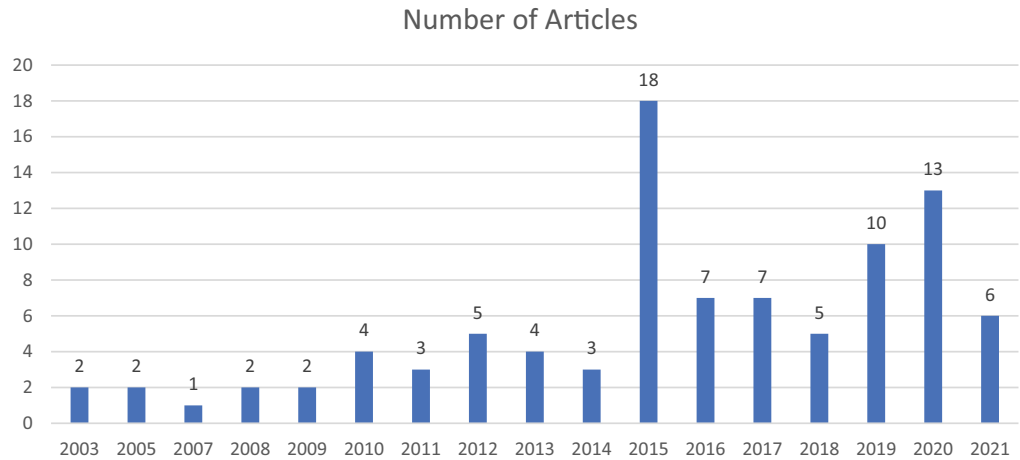
Figure 6 presents the published studies trends according to the year of publication as addressed in RQ2. Generally, the number of publications in this particular area of research fluctuated from year to year. The earliest studies were carried out in 2003, with two papers being published, while the latest was carried out in 2021 with six published documents. However, the peak in the number of publications was observed in the year 2015, with 18 documents, where most studies were conducted in developed countries from the European Union (EU) countries. The trend observed may be related to the efforts by the EU at the time to implement policies that are capable of encouraging entrepreneurship and boosting its cultural development. It is worth noting that the fewest studies were published from 2003 till 2009, with only one paper in 2007 as per the records.

#### 4.3. *Publication source and authors*

Based on the analysis of the selected publications regarding the source of publication as shown in Figure 7. The maximum number of publications were by the 8TH INTERNATIONAL CONFERENCE OF

**Figure 6. The trend of published studies.**

Source: Authors' analysis



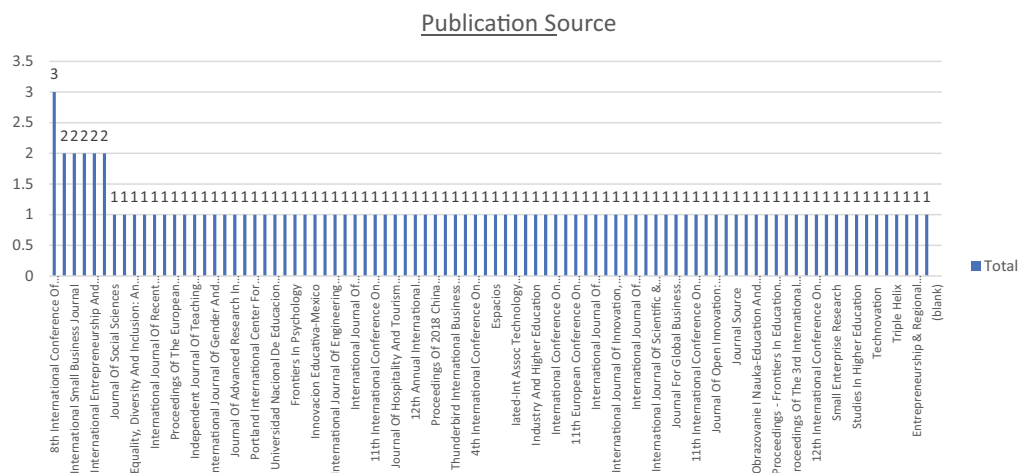
EDUCATION, RESEARCH AND INNOVATION, with a total of three conference papers. Other publishers published one or two papers. However, in terms of publication type, it was found that articles were more than conference papers and finally book chapters among analysed studies.

**4.4. Context analysis: based on countries and educational institutions**

Highlighting on RQ 3, in which Table 3 presents the number of published studies in the countries, based on (United Nations, 2019) economic classifications of countries concerning income level and Gross Domestic Product (GDP), as the following: (a) developed economies, (b) economies in transition, and (c) developing economies. The findings show that most of the studies in this area were conducted in developed countries, resulting in 29 developed economy countries. On the other hand, four studies were done about countries with economies in transition and 29 countries from developing economies. Furthermore, most studies were conducted in the EU countries such as Spain, Romania, Portugal, and others considered developed countries. The observation may be due to the great emphasis on EE, EC, and EI due to policies development in most EU countries and collaboration between the region's stakeholders, government, and educational institutions. From another perspective, many developed countries face a high unemployment rate, leading to more studies investigating the factors motivating and directing youth toward entrepreneurship.

**Figure 7. Distribution of articles according to the publication source.**

Source: Authors' Analysis



<b>Table 3. Researches by country</b>				
<b>Country Classification</b>	<b>Country</b>	<b>Number of studies in a specific country</b>	<b>Total number of countries based on the country classification</b>	<b>Total number of studies conducted based on the country classification</b>
Developed economies	Spain	12	29	87
	Belgium	1		
	Netherlands	3		
	Italy	2		
	Norway	3		
	France	4		
	Germany	3		
	Sweden	3		
	Austria	2		
	Ireland	1		
	EU Countries	6		
	Finland	2		
	Hungary	1		
	Croatia	2		
	Estonia	2		
	Canada	3		
	Australia	3		
	Greece	1		
	Romania	8		
	Portugal	9		
	United States	4		
	United Kingdom	4		
	Japan	1		
	Lithuania	1		
Poland	1			
Slovakia	1			
Slovenia	2			
Switzerland	1			
Czech Republic	2			
Economies in transition	Russian Federation	3	4	6
	Ukraine	1		
	Macedonia	1		
	Kazakhstan	1		

(Continued)

Country Classification	Country	Number of studies in a specific country	Total number of countries based on the country classification	Total number of studies conducted based on the country classification
Developing economies	China	11	29	65
	Indonesia	6		
	Malaysia	5		
	India	3		
	United Arab Emirates	2		
	Saudi Arabia	4		
	Cameroon	1		
	Singapore	2		
	South Africa	3		
	Mexico	2		
	Korea	3		
	Egypt	2		
	Iran	1		
	Nigeria	1		
	Algeria	1		
	Argentina	2		
	Pakistan	2		
	Cuba	1		
	Chile	2		
	Ecuador	1		
	El Salvador	1		
	Costa Rica	1		
	Morocco	1		
Panama	1			
Peru	1			
Uruguay	1			
Brazil	1			
Ghana	2			
Botswana	1			

Source: Compiled by authors

Regarding educational institutions, it was noticed that a higher number of studies were conducted at HEIs, followed by school, as the minimal studies looked at studies highlighting both (HEI and school) as well as (HEI and SME) at the same time. Additionally, most of the studies conducted focused more on samples from universities than schools, in which a possible explanation for that that most researchers were interested in discussing and solving the issue of increasing unemployment rate among graduates from HEIs, whereby the development of entrepreneurship at HEIs is considered one of the practical solutions. Based on the analysis shown in Appendix A (Table 1), the importance of developing EC in HEIs would be strengthening the interactions between HEI and stakeholders (private and public).



## 5. Discussion

It is vital to encourage entrepreneurship by creating and enhancing EC for economic development. This is applicable through educational institutions by developing students' entrepreneurial knowledge and skills. As per the analysis, it was noticed that educational institutions with EC could affect students' intention towards entrepreneurship and reduces unemployment rates. Besides, EE and EC's relationship was evident, as policymakers consider having strong EC by implementing EE to change students' mindsets. As a result, it was addressed that EC has an effects on students EI based on the reviewed studies. Most of the studies were done in developed countries rather than economic in transition and developing countries, considering the economic nature of these countries. In terms of educational institutions, it was found that HEIs are more addressed than schools. This could be due to the way of thinking among students concerning their career path when they study at HEI. In this section, more discussion will on studying ROs and RQs of this research..

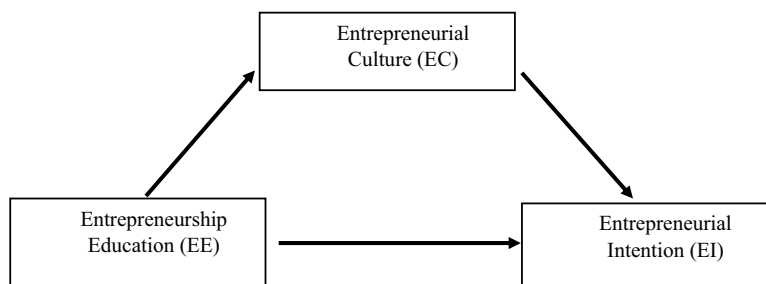
### 5.1. Relationship of variables

In general, the studies looking at the relationships between EE and EC were more than EC with EI, which means that more studies have to highlight the role of EC among these variables. Highlighting RO1, which addresses the relationship between these variables, it was noted a need for more studies to be testing and validating different roles of EC between EE and EI. Figure 8 elaborates on the proposed relationship between EE (independent variable -IV), EC (Mediator), and EI (dependent variable -DV) as per the reviewed studies, which could be validated later. According to (Baron & Kenny, 1986; Namazi & Namazi, 2016) suggested that the mediator is considered to be the third variable, which looks at the mechanism where the dependent variable DV is affected by the IV. The model focuses on a significant relationship between the variables: IV and mediator; mediator and DV; IV and DV (MacKinnon & Fairchild, 2009; Preacher & Hayes, 2008). There is a significant positive relationship between the variables in the discussion, EE, EC, and EI; as this study focuses on EC's role as a mediator in the relationship between EE and EI. Previous studies' have only suggested the role of EC as a mediator in the relationship between EE and EI, but the model has yet to be validated or tested (Akuegwu & Nwi-ue, 2016; Nwokolo et al., 2017).

These variables and their relationships would contribute to the knowledge by addressing the effect of EE on EC and later EI through measuring and validating it in the future, as Wardana et al. (2021) noticed that the scholars did not measure the effect of EE on EC. Hence, it is proposed that EE encourages the development of EC by cultivating the right mindset and intention towards firm creation; EC, in turn, drives individual EI. Mukhtar et al. (2021) found that EC and EE could see an acceleration in students' entrepreneurial thinking. Hence, it is obvious that the mediating role of EC in the relationship is needed to be measured. In addition, the inconsistent relationship between EC and EI addressed by Wu and Destech Publicat (2018) ,in which results shows mixed results when including gender differences. Hence, this opens a door for having other moderator variables like the demographic variables (Gender, Income, employment and others) between EC and EI. It was noted that Theory of Planned Behavior (TPB) by Ajzen (1991) was the most used theory among the analysed studies, which create an opportunity to test EE relationship with EI using the proposed mediating role of EC by changing Subjective Norms (SN) in TPB, as proposed by (Wibowo et al., 2020).

Figure 8. Proposed framework.

Source: Authors' Analysis



### **5.2. Publication trend and study context**

RO 2, which focused on the publication trend, showed a fluctuated manner presented earlier in Figure 6. While RO 3 highlighted the contextual aspects focusing on the place where the study was conducted. In this study, it is worth mentioning that period from 2003 to 2009 had range of 1 to 5 publications per year. The year 2015 saw the highest number of articles published, with 18 papers, as most studies were conducted in developed countries, especially in EU countries. In this regard, the possible explanation could be supported by (Jardim et al., 2021; Tudor et al., 2020) mentioning several reasons related to EU efforts regarding the implementation practices that enhance entrepreneurship and stimulate cultural aspects. Also, one of the strategic goals of European policies was to develop EC with a foundation leading towards a flexible and responsible labour market, along with a belief of ambitious and entrepreneurial faith. Moreover, the EU commission encourages EE at all levels of education and educational institutions, from primary schools to universities. From another perspective, EE programs globally develop individual skills and intentions. Countries with unique entrepreneurial cultures seem to have a long learning journey, with competitive strategies for educational programs to promote entrepreneurship amongst the youth. It is indicated that the EU and developed countries worked on education for a long time, especially EE compared to the economic in transition and developing countries.

This study found the volume of the second-highest publication was in 2020, with 14 studies mostly from developing countries. Several reasons could lead to this, like the developing economic nations are in continuous economic growth, and more attention is required to entrepreneurship as well as its related aspects (Jardim et al., 2021). Moreover, scholars in developing countries focus more on publications and research due to the need and available opportunities for research which demand more studies to be investigated and published.

Regarding educational institutions that studies were focusing on, it is notable that the volume of studies concentrated on HEIs more than schools. The possible reason for this finding could be that most academics focused on addressing the high unemployment rate of HEI graduate students, considering entrepreneurship development as one of the valuable solutions. Besides, Nurmukhanova et al. (2021) suggested that the main role of universities would be to optimize knowledge, which explains the importance of entrepreneurial and innovative universities as centres for technological development and start-ups, through having value-adding, qualified and experienced workers, that would increase in the regional level of goods or service and welfare. Hence, these reasons would show why more studies are conducted in HEI than schools from the analysed studies.

### **5.3. Population of studies**

RO 4 focused on the most highlighted population among the analysed studies, which were students. The availability of information regarding entrepreneurship at HEIs prepares the students to succeed in the business world. This could be elaborated by the view of S. Mukhtar et al. (2021) that students are often more open-minded to accept new knowledge and skills when the educational institution has a supportive entrepreneurial culture. Moreover, the HEI enables students to generate creative ideas for becoming entrepreneurs as an alternative career path.

Another aspect to be considered in implementing EE is to enhance EC, and then later EI focuses on the strategic decision by the management of HEIs considering different perspectives. This could be represented in several ways and organizational levels among students, staff, teachers or externals. The idea is that business schools and academic management departments mainly offer entrepreneurship courses. Therefore, this would progressively enrich with the transfer of knowledge and skills to students through case studies and classroom talks by entrepreneurs as role models. More in-depth, Nicotra et al. (2021) suggested that offering many activities related to EE, like the importance of mentors is becoming crucial. As well as offering other initiatives and scholarships would attract and uncover entrepreneurial talents at the HEI. Hence, engagement with the external community, including entrepreneurs and anyone with a background in

entrepreneurship, can have a potential impact by permitting them to educate, coach, teach, and instruct students with potential business ideas. Consequently, this study highlights the importance of internal and external aspects at the HEI to enhance and develop an effective EC. Experienced entrepreneurs should be engaged in these kinds of activities as a sponsor, competition judge, monitoring and coaching, or as a lecturer in a course or workshop where they would share their views dealing with tricks and joys. Besides, strengths and weaknesses have also been shown to create students' intentions at the HEI (Sousa et al., 2019).

From another point of view, several scholars, (Dif et al., 2019; Nurmukhanova et al., 2021; Tudor et al., 2020), highlighted the importance of faculty involvement in EC creation and development, especially the teaching team at the HEI being aware of EC importance and implementation. Furthermore, it was noted that implementing EE in HEIs by having a system of continuous human resources and specialized professional training in the field of entrepreneurship would help to foster the development of entrepreneurial culture and the attitude among the organisation's employees .

One of the most important factors related to teachers' competencies was about creating strong EC and entrepreneurial thinking teachers' considering the experience in delivering EE. To develop EC in HEI, several scholars (Huang et al., 2020; Tudor et al., 2020; Wibowo et al., 2020) believed that the development of EC and teachers attitudes towards entrepreneurship are crucial as HEI lecturers think that engaging in a postgraduate entrepreneurial training program is beneficial to their professional development as teachers are in the scientific and academic field. Moreover, teaching staff must have a diverse set of entrepreneurship skills to motivate their students and assist them in developing their entrepreneurial mindset. Instead of lecturers providing answers to students, it is preferred to assist them in conducting research and identifying the best questions and answers technique. In essence, for HEIs to become entrepreneurial, a supportive environment should be created. The obligation of HEI towards faculty members would be to provide the necessary facilities and create an entrepreneurially oriented policy followed by proper implementation. Besides, HEI must begin developing a research guideline that includes research projects, in which this arrangement with a road map will serve as an umbrella for all teaching staff and departments. Also, institutions, faculty, and different departments must enhance the research skills of faculty members for academic research to do proper research. In addition, an incentive structure must be established for faculty members to have a favourable attitude about applied research and the motivation to do it, which would lead to better engagement of lecturers in the development of EC at educational institutions.

The strategic decision by top management at the educational institutions like examining the HEI internally and externally is crucial. Considering different perspectives of students, parents, teachers, employees, university top and middle management at the educational institutions would lead to the continuous development of the educational process and its activities. Hence, it would be vital for educational institution top management to work with internal and external stakeholders by implementing different concepts, like the Triple Helix model (university-industry-government relations) highlighted by (Etzkowitz & Leydesdorff, 2000). Additionally, Etzkowitz and Zhou (2007) suggested that the Triple Helix model could be enhanced by having an entrepreneurial university in different ways. Establishing a dynamic relationship between academics, government, and industry to build innovative industries and resolve current issues is essential (Nurmukhanova et al., 2021). Besides, Vaivode (2015) declared that research and development (R&D) is vital for organisation innovation, especially with the implementation of the Triple Helix model indicated as the following Industry (Business), Government (Governance), and University (Science). Furthermore, the study by Carson (1993) highlighted on the idea of joint learning between young managers (new graduates) and entrepreneurs, as it is possible to design cooperative learning to benefit from each other (Al-Lawati, 2017). Hence, this leads to new concepts to be highlighted like Triple Helix model, entrepreneurial university, and joint learning that could be implemented in creating EC at educational institutions.

#### **5.4. Publication type**

Finally, RO 5 looked at the publication type, as it was found that the highest publication were article papers published in journals, followed by the conferences paper and proceeding. This could be explained as elaborated by Zhang and Glänzel (2012) that conference proceedings papers acquire lower citations on average than other research pieces in other areas. Besides, the reason could be that scholars feel unwilling to wait until a future conference to present data that they consider truly new.

#### **6. Conclusion**

Starting with research questions like RQ 1, it was found that there is a significant relationship between the three variables EE, EC, and EI in different aspects. Besides, the mediating role of EC in the relationship between EE and EI was mentioned but not validated or tested. Hence, it is suggested that there is a need for further research in this area of study in future. The findings also demonstrate that adopted theory by researchers studying these relationships was the TPB (Ajzen, 1991). Moreover, RQ 2 and RQ 3 were about publication trends and the research context of the analysed studies. The findings demonstrated a fluctuating volume of published works in particular area of study. Furthermore, the findings show that most studies in the area were conducted in developed countries compared to economies in transition countries and developing economies at HEIs more than schools. Interestingly, the trend peaked in 2015, where most studies were conducted in EU countries due to attention given toward implementing entrepreneurship-related policies in the member countries. On the other hand, recently the developing countries started to focus more on research due to the availability of information and continuous economic growth. Additionally, regarding RQ 4 focuses on the population, it was found that students are more highlighted than teachers (faculty), as this could be that students are more concerned about unemployment issue but the engagement of teachers and top management is crucial for EC creation and enhancement. Finally, RQ 5 was regarding publication type in which article papers were more than conference papers for citation purposes, as quantitative studies were more than qualitative in study design.

It is recommended that policymakers formulate policies that aim to boost the development of EC by fostering strategic collaboration between stakeholders and educational institutions. Additionally, academic institutions are encouraged to improve EC among academic and non-academic staff, students, and the rest of the stakeholders through innovative and practical approaches, such as curriculum development and entrepreneurship training seminars. In addition, practitioners (entrepreneurs) should be allowed to play a proactive task as role models for students. The interaction between educational institutions and entrepreneurs will help to keep the students in touch with the latest development in the entrepreneurial field. The adaptation of concepts like the Triple Helix model, Joint learning, and entrepreneurial university would be interesting studies when EC is created in educational institutions. In general, this study used only two databases, in which other databases could be used in future research.

#### **7. Future research**

For further research, it is recommended to measure and validate these relationships by having a standard and reliable instrument as there is a scarcity of research carried out to study the relationship between EE, EC, and EI. This study could also be further improved by conducting a comprehensive review using other research approaches or empirical studies in the future. Besides, developing and economies in transition countries might need to have more studies in this regard. Considering other search databases for publications would add to the analysis. Finally, studies about the relationship of EE-EC-EI could be synergized between individual and organizational levels.

### Acknowledgements

The authors would like to express their gratitude to and the Ministry of Higher Education, Research and Innovation in the Sultanate of Oman as well as to Azman Hashim International Business School at Universiti Teknologi Malaysia (UTM).

### Funding

The research leading to these results has received project funding from the Ministry of Higher Education, Research and Innovation in the Sultanate of Oman's (MoHERI - TRC) Agreement No. [MoHERI/GRG/INT.S/06/2020]. In addition, the authors are grateful for different kind of support from the Azman Hashim International Business School at Universiti Teknologi Malaysia (UTM).

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### Disclosure statement

No potential conflict of interest was reported by the authors.

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### Citation information

Cite this article as: Entrepreneurial culture in educational institutions: A scoping review, Essam Hussain Al-Lawati, Umar Haiyat Abdul Kohar & Ebi Shahrin Suleiman, *Cogent Business & Management* (2022), 9: 1997237.

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## Appendix A.

**Table A1. Analyses different aspects regarding the paper, like the author(s), year of publication, title of study, publication type, publication source, title of study, publication type, publication source, study design, keywords, study population, country, context (educational institution)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
<b>EC- EE</b>								
Wardana et al. (2021) ***	Drivers of entrepreneurial intention among economics students in Indonesia	Article	Entrepreneurial Business And Economics Review	Quantitative	entrepreneurship education; entrepreneurial intention; entrepreneurial attitude; entrepreneurial culture; students' intention	Students	Indonesia	HEI
S. Mukhtar et al. (2021) ***	Does entrepreneurship education and culture promote students' entrepreneurial intention? The mediating role of entrepreneurial mindset	Article	Cogent Education	Quantitative	entrepreneurship education; entrepreneurial culture; entrepreneurial intention; entrepreneurial mindset	Students	Indonesia	HEI
Llados-Maslorens and Ruiz-Dotras (2021) ***	Are women's entrepreneurial intentions and motivations influenced by financial skills?	Article	International Journal Of Gender And Entrepreneurship	Quantitative	Self-employment, Entrepreneurship education and training, Womens' entrepreneurship, Social entrepreneurship	Students	Spain	HEI

(Continued)

**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
João and Silva (2021)	Cultivating entrepreneurship in higher education during a crisis condition: crisis related issues discussed in entrepreneurship literature	Conference Paper	2021 IEEE Global Engineering Education Conference, Educon 2021	Qualitative	Entrepreneurship, Higher education, Crisis environment	-	Portugal	HEI
Nicotra et al. (2021)	Fulfilling university third mission: towards an ecosystemic strategy of entrepreneurship education	Article	Studies In Higher Education	Qualitative	entrepreneurship education; Entrepreneurial University; ecosystem	-	-	HEI
Jordim et al. (2021)	Towards a global entrepreneurial culture: a systematic review of the effectiveness of entrepreneurship education programs	Article	Education Sciences	Qualitative	entrepreneurial programs; pedagogical interventions; educational interventions; entrepreneurship education; entrepreneurial culture; effectiveness; globalization	Teachers and Students	Germany, Spain, Austria, Romania, Portugal, France, Chile, United states, Korea, Norway, Botswana, Malaysia, Ghana, Canada, Australia, Netherlands, Singapore, Italy, Slovenia, United Kingdom, Sweden, Taiwan	HEI and School

(Continued)

**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
Huang et al. (2020)	Exploring factors link to teachers' competencies in entrepreneurship education	Article	Frontiers In Psychology	Quantitative	entrepreneurship education, educational evaluation, competency, teacher training, education quality	Teachers	China	HEI
Tudor et al. (2020)	Study on the development of entrepreneurial culture in the university environment	Conference Paper	12th International Conference On Electronics, Computers And Artificial Intelligence, ECAI 2020; Bucharest; Romania; 25 June 2020 Through 27 June 2020; Category Number:cp2027J-ART; Code 164,065	Quantitative	entrepreneurial culture, social entrepreneurship, entrepreneurial skills	Teachers	EU countries and Romania	HEI
Chandrasekar (2020)	Institutional facilitation towards sustainable entrepreneurial culture among professional graduates	Article	International Journal Of Scientific & Technology Research	Mix Method	Entrepreneurship, professional graduates, sustainable entrepreneurship	Students	India	HEI

(Continued)



**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
A. A. Ayob (2020)	Institutions and student entrepreneurship: the effects of economic conditions, culture and education	Article	Educational Studies	Mix Method	Institutional theory; eclectic theory of entrepreneurship; entrepreneurial culture; entrepreneurship education	Students	49 countries	HEI
O'Flaherty et al. (2020)	European-wide ICT entrepreneurship education in action	Conference Paper	15th European Conference On Innovation And Entrepreneurship, ECIE 2020; Rome, Virtuati, Italy; 17 September 2020 Through 18 September 2020; Code 165,521		European wide ICT entrepreneurship education	Students	EU Countries	School
Hamburg et al. (2019)	Entrepreneurship business research skills	Conference Paper	13th Proceedings Of The International Conference On Business Excellence	Mix Method	Entrepreneurship, Business Research Skills, Entrepreneurial capacity, Growth oriented SME business	SME	EU Countries	HEI and SME

(Continued)

**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
Shi et al. (2019)***	Perceived university support, entrepreneurial self-efficacy, heterogeneous entrepreneurial intentions in entrepreneurship education: the moderating role of the Chinese sense of face	Article	Journal Of Entrepreneurship In Emerging Economies	Quantitative	Entrepreneurship education, Entrepreneurial intention, Entrepreneurial culture, Entrepreneurial efficacy, Promoting students, Personal traits	Students	China	HEI
Muhammed Sajjad and Sathyapriya (2019)	Effect of entrepreneurship education on MBA students in Kerala on their entrepreneurial intent with special reference to the students of mahatma gandhi university, Kottayam, Kerala	Article	International Journal Of Recent Technology And Engineering	Quantitative	business, entrepreneurship, risk taking, training	Students	India	HEI

(Continued)

**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
A. H. Ayob (2019)	Entrepreneurship education, institutions and student entrepreneurship: a cross-country analysis	Article	Compare: A Journal Of Comparative And International Education	Mix Method	Entrepreneurship education; student entrepreneurship; institutional theory; entrepreneurial culture; ease of doing business	Students	Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, China, Croatia, Ecuador, El Salvador, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Kazakhstan, Korea-Republic, Lithuania, Macedonia, Malaysia, Mexico, Morocco, Netherlands, Panama, Peru, Poland, Portugal, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom, United States, Uruguay	HEI
Dif et al. (2019)	The role of the startup competition and entrepreneurial ecosystem in the integration of entrepreneurship education within the Algerian universities	Conference Paper	AHFE International Conference On Human Factors, Business Management And Society, 2018; Orlando; United States; 21 July 2018 Through 25 July 2018; Code 215,359	Qualitative	Algerian university; Entrepreneurship education; Startup competition; Entrepreneurial ecosystem; Innovation culture	Teachers (Faculty)	Algeria	HEI

(Continued)

**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
Hashim et al. (2019)	Islamic entrepreneurship education model for higher education institution	Article	Journal Of Advanced Research In Dynamical And Control Systems	Qualitative	Entrepreneurship education, Higher education institution, Islamic entrepreneurship	Students	Malaysia	HEI
Paiva et al. (2019)	Assessment of entrepreneurial education in higher education institutions, using HEINNOVATE	Conference paper	11th International Conference On Education And New Learning Technologies (EDULEARN)	Qualitative	Higher Education Institutions; Entrepreneurship Education; HEInnovate	Teachers (Faculty)	Portugal	HEI
Owusu-Agyeman (2019)	The relevance of entrepreneurial culture in universities to the development of students' entrepreneurial skills	Conference paper	12th Annual International Conference Of Education, Research And Innovation (ICERI)	Qualitative	entrepreneurial education; technology; innovation; higher education; institutional culture	Teachers	Ghana	HEI
Pluzhnik et al. (2018)	Are entrepreneurs born or made? Effective academic models to foster entrepreneurial graduates	Article	<i>The Education and Science Journal</i>	Qualitative	entrepreneurship education, entrepreneurial competencies, university, academic models.	Students	Russia	HEI

(Continued)

**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
Ribeiro et al. (2018)	Building builders: entrepreneurship education from an ecosystem perspective at MIT	Article	Triple Helix	Qualitative	Entrepreneurial universities; University; Entrepreneurship; Entrepreneurial ecosystems; Entrepreneurship education; Education; Innovation; Entrepreneurial culture; Spin-offs; Venture creation; MIT; Massachusetts Institute of Technology	Multiple investigators	United States	HEI
X. H. Zhu and Zhang (2018)***	The influence of entrepreneurial culture environment perception on the relationship between entrepreneurial education and college students' entrepreneurial intentions	Conference paper	Proceedings Of 2018 China Marketing International Conference: Smart Marketing: Human, Technology And Innovation	Quantitative	entrepreneurial culture environment perception; entrepreneurship education; entrepreneurial intention; college students entrepreneurship	Students	China	HEI
Herrera and Rodriguez (2017)	Business education: an approach based on university students from two institutions of higher education	Article	Innovacion Educativa-Mexico	Quantitative	Business education; entrepreneurs; institutions of higher education; professors of entrepreneurs; university students	Students	Mexico	HEI

(Continued)

**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
Susilingsih and Siswandari (2017)	Identification of academic culture dimensions in entrepreneurship learning at universities in central java	Conference paper	3rd International Conference On Teacher Training And Education (ICTTE)	Quantitative	academic culture; entrepreneurial culture; entrepreneurial learning	Students	Indonesia	HEI
Bernal Guerrero and Cárdenas Gutiérrez (2017)	Assessment of enterprise potential in students. A longitudinal study	Article	Educación XX1 , Universidad Nacional De Educacion A Distancia	Mix Method	Entrepreneurship education; management education; training programme; compulsory education; teacher education.	Teachers and Students	Spain	HEI
Musetsho and Lethoko (2017)***	An evaluative study on the effect of entrepreneurial education curriculum on students at the university of Venda, south Africa	Article	Independent Journal Of Teaching And Learning	Quantitative	entrepreneurship education, entrepreneurial intention, entrepreneurial attributes, entrepreneurial learning	Students	South Africa	HEI
Dias and Soares (2017)	Highlighting entrepreneurship skills in academic curricula: "i still haven't found what i'm looking for"	Conference paper	9th International Conference On Education And New Learning Technologies (Edulearn17)	Mix method	Entrepreneurship; Learning outcomes; higher education	-	Portugal	HEI

(Continued)

**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
Nwokolo et al. (2017)	Entrepreneurship education as a viable tool for the reduction of poverty	Article	Journal Of Social Sciences	Quantitative	Entrepreneurship; Poverty; Development; Job Creation. Promotion	Students	South Africa	HEI
Rogers and Hewson (2016)	Development of an early on-set innovation culture in Australia	Article	Small Enterprise Research	Qualitative	Innovation; education; early stage; culture; entrepreneurship	-	Australia	School
Lindh and Thorgren (2016)	Entrepreneurship education: the role of local business	Article	Entrepreneurship & Regional Development	Qualitative	Entrepreneurship; regional development; education; policy; collaboration; entrepreneurial culture	Students	Sweden	HEI and School
Wardani et al. (2016)	Food production and training centre: an entrepreneurial approach for education system in food science	Conference paper	10th International Technology, Education And Development Conference (INTED)	Qualitative	Food Production and Training Centre; Entrepreneurship education; project-based learning	Students	Indonesia	Training center
Del Arco et al. (2016)	Final year project (FYP) based entrepreneurship. The case of teacher training at university of Lleida	Conference paper	lated-10th International Technology, Education and Development Conference (INTED)	Mix Method	teacher training; university; entrepreneurial; final year project (FYP)	Students and Teachers (Faculty)	Spain	HEI

(Continued)

**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
Ghobril et al. (2016)	Beyond Entrepreneurship Courses: Strategy, Structure And Processes At Illinois Tech To Become An Entrepreneurial University/Para Alem Dos Cursos De Empreendedorismo: Estrategia, Estrutura E Processos Na Illinois Tech Para Se Tornar Uma Universidade Empreendedor/Mas Alla De Los Cursos De Emprendimiento: Estrategia, Estructura Y Procesos En Illinois Tech Para Convertirse En Una Universidad Empresarial'	Article	Revista de Empreendedorismo e Gestao de Pequenas Empresas	Qualitative	entrepreneurship education; strategy alignment; educational process; experiential learning	Students	United States	HEI
Vilcov and Dimitrescu (2015)	Management of entrepreneurship education: a challenge for a performant educational system in Romania	Conference paper	3rd International Conference On Education And Psychology Challenges— Teachers For The Knowledge Society (EPC-TKS)	Mix Method	entrepreneurship; entrepreneurship education; entrepreneurial competencies; entrepreneurial culture; economic and social development	Students	Romania	HEI and School

(Continued)



**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
N. N. Cao (2015)	To strengthen the construction of entrepreneurial culture in colleges and universities and promote college students' three views education	Conference paper	3rd International Conference On Social Sciences Research (SSR 2015)	Qualitative	Entrepreneurial culture in colleges and universities; Three Views education; Methods	Students	Singapore	HEI
Alonso and Garcia (2015)	A cross-curricular psycho-pedagogical approach to enhance entrepreneurial attitudes and intentions among engineering students	Conference paper	8th International Conference Of Education, Research And Innovation	Quantitative	Engineering; entrepreneurship; curriculum development; cognitive psychology; personality	Students	EU countries	HEI
F. M. Vidal et al. (Vidal, et al., 2015)	Entrepreneurship, communication and ICT in secondary education	Conference paper	8th International Conference Of Education, Research And Innovation (ICERI)	Mix Method	Entrepreneurship Communication; ICT; innovation; secondary school; educational organizations	Students	Spain	School
Duicu and Stan (2015)	European policies on entrepreneurship education and associated implementation risks through projects initiated by students in Romania	Conference paper	8th International Conference Of Education, Research And Innovation (ICERI)	Quantitative	European policies; entrepreneurial education; risk; young people	Students	EU Countries	HEI

(Continued)

**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
P Peterka, et al., 2015	Challenges of evaluation of the influence of entrepreneurship education	Article	Economic Review: Journal of Economics and Business	Quantitative	entrepreneurship; entrepreneurship education; impact of entrepreneurship education	Students	Croatia	School
Carvalho et al. (2015)	A success story in a partnership programme for entrepreneurship education; outlook of students' perceptions towards entrepreneurship	Article	International Journal Of Management In Education	Mix Method	assessment; career choice; entrepreneurship education; entrepreneurship education model entrepreneurial programmes; entrepreneurial spirit; higher education; partnership programmes; secondary education; student perceptions; entrepreneurial culture; cultural values; economic development; entrepreneurial skills; student awareness.	Students and Teachers (Faculty)	Portugal	HEI and School
Valencia et al. (2015)***	Explanatory factors of entrepreneurial intentions among university students	Article	Espacios	Quantitative	entrepreneurial intention; business education and entrepreneurship	Students	Spain	HEI

(Continued)

**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
Ahmad (2015)	Entrepreneurship education in tourism and hospitality programs	Article	Journal Of Hospitality And Tourism Education	Mix Method	entrepreneurship education, curriculum, hospitality and tourism, United Arab Emirates	Students	United Arab Emirates	HEI
Alalwany and Saad (2015) <sup>***</sup>	Entrepreneurial education programmes and their impact on entrepreneurs' attributes	Conference paper	Proceedings Of The European Conference On Innovation And Entrepreneurship, ECIE 2015-January, Pp. 15-24	Qualitative	Entrepreneurial capabilities, Entrepreneurial education, Entrepreneurial university, Entrepreneurs' attributes	-	Saudi Arabia	HEI
Nikneshan et al. (2015)	Entrepreneurship education from the viewpoint of Islam	Article	Mediterranean Journal Of Social Sciences	Qualitative	the man; being a doer, a work-focused will, entrepreneurial culture	-	Iran	HEI and School
Tape and Shahramfar (2015)	The Role Of Education And Research In Developing Entrepreneurship Culture (From Value And Islamic Perspective)	Article	The Social Sciences (Pakistan)	Qualitative	Entrepreneurship, entrepreneurship education, Islamic value approach, academin, life, business environment	Students	-	HEI

(Continued)

**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
Mukhtar & Redman, 2015	In search of success factors for a sustainable macro entrepreneurship and enterprise education policy: evidence from the european union	Article	Journal For Global Business Advancement	Qualitative	macro entrepreneurship policy model; enterprise education; European Union; entrepreneurship competences; European Commission; sustainable enterprise; enabling environment; schools; critical success factor.	Students	EU countries	School
Paiva and Tadeu (2015)	Produz@ideia- an approach project to develop entrepreneurship in primary schools	Conference Paper	5th International Conference On New Horizons In Education (INTE)	Qualitative	Entrepreneurship Education; Primary and High Education Institutions, Problem-based-solution	Students	Portugal	HEI and School
Khalil (2015)	A model of a research and entrepreneurial university for developing nations: the case of Nile university	Conference Paper	24th International Association For Management Of Technology, Innovation And Management For Sustainable Growth, IAMOT 2015	Qualitative	Culture of knowing, Development, Education, Entrepreneurship, Innovation, Learning culture, Research university, Wealth creation	-	Egypt	HEI

(Continued)

**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
Prochazkova (2014)	Connection between entrepreneurship and education: call for raising entrepreneurial spirit	Conference Paper	24th International Business Information Management Association Conference—Crafting Global Competitive Economies: 2020 Vision Strategic Planning And Smart Implementation	Qualitative	Competitiveness, Entrepreneurial spirit, Entrepreneurship, Entrepreneurship education	-	Czech Republic	HEI
Neneh (2014)***	An assessment of entrepreneurial intention among university students in Cameroon	Article	Mediterranean Journal Of Social Sciences	Quantitative	Entrepreneurial intention, entrepreneurship, motivation, obstacles, Cameroon	Students	Cameroon	HEI
Gao (2014)	The value of university social entrepreneurship education and its implementation model	Conference Paper	2nd International Conference On Education Technology And Information System (ICETIS)	Qualitative	Entrepreneurship education; Value; Implementation mode	Students	China	HEI
Bai (2013)	On entrepreneurship education service system for college students from the perspective of economics	Conference Paper	3rd International Conference On Social Sciences And Society (ICSSS)	Qualitative	University student; Entrepreneurship; Education Service system	Students	China	HEI

(Continued)

**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
Dinis et al. (2013)***	Psychological characteristics and entrepreneurial intentions among secondary students	Article	Education And Training	Quantitative	Entrepreneurial intention, Entrepreneurship education, Psychological characteristics	Students	Portugal	School
Minaipoor and Kanani (2013)	Assessment: Iranian youth's entrepreneurial attitudes improvement across training for youth entrepreneurs (KAJ)	Article	Advances In Environmental Biology	Quantitative	Youth Entrepreneurship, KAJ Plan, Entrepreneurial attitudes, Entrepreneurship Education	Students	Iran	HEI
Anuar et al. (2013)	Barriers to start-up the business among students at tertiary level: a case study in northern states of peninsular Malaysia	Article	Asian Social Science	Quantitative	barriers, business, personality traits, entrepreneurial skills, micro level	Students	Malaysia	HEI
Ejiogu and Nwajiuba (2012)	The need for inclusion of entrepreneurship education in Nigerian school curricula	Article	Thunderbird International Business Review	Qualitative	-	Students	Nigeria	HEI and school
Z. Z. Liu et al. (2012)	Taking campus cultural activities as carrier to develop the college students' innovation and entrepreneurship ability	Conference Paper	2nd International Conference On Physical Education And Society Management (ICPESM 2012)	Quantitative	Campus cultural activities; Sports college students; Innovation and entrepreneurship ability; Training method	Students	China	HEI

(Continued)

**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
Lamas (2012)	Education for entrepreneurship	Conference Paper	International Conference On Entrepreneurship Education—A Priority For The Higher Education Institutions	Mix Method	Entrepreneurship; education; sustainable development; human capital; entrepreneurial culture	Students	Romania	HEI
X. F. Cao (2012)	Research on the countermeasures of enterprise education in universities	Conference Paper	International Conference On Management Innovation And Public Policy (ICMIIPP)	Quantitative	colleges and universities; college students; entrepreneurship education; venturing-awareness	Students	China	HEI
Pedersen and Sjøvoll (2012)	Leadership—entrepreneurial mindsets and entrepreneurial schools	Conference Paper	4th International Conference On Education And New Learning Technologies (EDULEARN)	Quantitative	entrepreneurship; entrepreneurial cultures; mindset; education; innovation	Students	Norway	School
Muntean and Nistor (2011)	Entrepreneurial culture of young people—entrepreneurship education	Article	Quality—Access To Success		Abilities, Entrepreneurship education, Motivation, Opportunities	Teachers and Students	Romania	HEI

(Continued)

**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
Romero et al. (2011) ***	Universities as suppliers of entrepreneurship education services. The cases of the university of Seville and the academy of economic studies in Bucharest	Article	Amfiteatru Economic	Quantitative	entrepreneurial intention, entrepreneurship education, university, entrepreneurship supply, entrepreneurial culture, knowledge-based economy	Students	Spain and Romania	HEI
Kirby and Ibrahim (2011)	Entrepreneurship education and the creation of an enterprise culture: provisional results from an experiment in Egypt	Article	International Entrepreneurship And Management Journal	Qualitative	Entrepreneurship . Education . Culture . Egypt . GET brain dominance	Students	United Kingdom and Egypt	HEI
Kaseorg et al. (2010)	Entrepreneurship education in life long learning	Conference Paper	3rd International Conference Of Education, Research And Innovation (ICERI)	Mix method	entrepreneurship education; lifelong learning; Estonia	students	Estonia	-
Teodorescu and Fratila (2010)	Development of education and potential opportunities for entrepreneurship in Romania	Conference Paper	5th European Conference On Entrepreneurship And Innovation	Qualitative	entrepreneurship education; innovation; partnership; regional policies; strategy	Students	Romania	HEI
Luca (2010)	Innovation, an important part of Romanian higher education	Conference Paper	6th International Seminar On The Quality Management In Higher Education	Mix method	innovation; entrepreneurship; higher education	Students and Teachers (Faculty)	Romania	HEI

(Continued)



**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
Rae et al. (2009)	Creating an enterprise culture in a university: the role of an entrepreneurial learning team	Article	Industry And Higher Education	Qualitative	entrepreneurial teaching; entrepreneurial university; entrepreneurship education; enterprise; University of Derby	Teachers (Faculty)	United Kingdom	HEI
Nelson and Lumsdaine (2008)	Creating an entrepreneurial culture in an engineering university	Conference Paper	ASEE Annual Conference And Exposition, Conference Proceedings 2008, 14p	Qualitative	-	Teachers (Faculty) and Students	USA	HEI
Evans et al. (2007)	The idea to product® program: an educational model uniting emerging technologies, student leadership and societal applications	Article	International Journal Of Engineering Education	Qualitative	Entrepreneurship, I2P, Idea to Product, Innovation, International, Technology commercialization	Teachers(Faculty) and Students	United States	HEI
Postigo and Tamborini (2005)	Entrepreneurship education in Argentina: the case of the San Andres university	Book Chapter	Business Education And Emerging Market Economies: Perspectives And Best Practices 2005, Pages 267-282	Qualitative	-	Students	Argentina	HEI

(Continued)

**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
Mahlamäki-Kuitanen (2005)	Gender and sector effects on Finnish rural entrepreneurs' culture: some educational implications	Book Chapter	Entrepreneurship Research In Europe: Outcomes And Perspectives1 January 2005, Pages 292–312	Qualitative	-	Students	Finland	HEI
Barbe et al. (2003)	Holistic approach for technology entrepreneurship education in engineering	Conference Paper	Proceedings—Frontiers In Education Conference volume 1, 2003, Pages T2D1-T2D6	Qualitative	accelerator, boot camp, business plan competition, incubator	Students	United States	HEI
Carayannis et al. (2003)	A cross-cultural learning strategy for entrepreneurship education: outline of key concepts and lessons learned from a comparative study of entrepreneurship students in France and the US	Article	Technovation	Quantitative	Technological learning; Entrepreneurship; Cross-cultural education; New ventures	Students	United States and France	HEI
Naz et al. (2020)	Linking proactive personality and entrepreneurial intentions: a serial mediation model involving broader and specific self-efficacy	Article	Journal Of Open Innovation: Technology, Market, And Complexity	Quantitative	Creative self-efficacy, Entrepreneurial intentions, Entrepreneurial self-efficacy, Leadership self-efficacy, Learning self-efficacy, Proactive personality	Students	Pakistan	HEI

(Continued)

**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
Ayed (2020)	Extending the debate over entrepreneurial education effectiveness: the case of a Saudi university	Article	Education And Training	Quantitative	Entrepreneurial education, Entrepreneurial intention, Entrepreneurial motivation, Innovativeness, PLS-SEM, Umm Al qura university	Students	Saudi Arabia	HEI
Ahmed et al. (2020)	Predicting entrepreneurial intentions through self-efficacy, family support, and regret: a moderated mediation explanation	Article	Journal Of Entrepreneurship In Emerging Economies	Quantitative	Pakistan, Students, Entrepreneurial intentions, Self-efficacy, Anticipated regret, Family support	Students	Pakistan	HEI
Wibowo et al. (2020)	Investigating the determinants of academic entrepreneurial intention: evidence from Indonesia	Article	International Journal Of Innovation, Creativity And Change	Quantitative	Academic entrepreneurial intention, Attitude, Entrepreneurial culture, Entrepreneurial orientation, Entrepreneurial self-efficacy, Entrepreneurial university	Teachers (Faculty)	Indonesia	HEI

(Continued)

**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
García-Rodríguez et al. (2020)	Entrepreneurial intentions in the context of a collectivist economy: a comparison between Cuba and Spain	Article	International Entrepreneurship And Management Journal	Quantitative	Collectivist economy, Entrepreneurial context, Entrepreneurial intention, Entrepreneurship, Cuba, Desirability, Feasibility, Entrepreneurial event model	Students	Cuba and Spain	HEI
Fridhi and Alwheeb (2020)	The entrepreneurial intention of graduate students: challenges and prospects	Article	International Journal Of Entrepreneurship	Quantitative	Accounting, Organization, Banking Operations, Management Reporting, Accounting Policy, Information Base	Students	Saudi Arabia	HEI
Herrera-Valverde et al. (2020)	Costa Rican university entrepreneurial ecosystem and its link with the entrepreneurial intention: an exploratory study	Article	Tec Empresarial	Qualitative	University entrepreneurship; entrepreneurial ecosystem; entrepreneurial intention	Professionals	Costa Rica	HEI

(Continued)

**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
Zhao and Cui (2019)	Analysis and enlightenment of cultural factors influencing college students' entrepreneurial intention: take bourdieus concept of fieldas the model	Conference Paper	4th International Conference On Education & Education Research (EDUER 2019)	Qualitative	Entrepreneurial intention; culture; in the field; rituals	Students	China	HEI
F. F. Jabeen et al. (2019)	Perceptions and career choices linked to the uae youths entrepreneurial intention	Conference Paper	9th International Conference On Industrial Engineering And Operations Management, IEOM 2019; JW Marriott Hotel Bangkok, bangkok; Thailand; 5 March 2019 Through 7 March 2019; Code 141,008	Quantitative	Big Five Traits, Education, Entrepreneurship, Intention, Youths	Students	United Arab Emirates	HEI and School
Wu and Destech Publicat (2018)	Empirical study of the effect of entrepreneurial environment on college students' entrepreneurial intention in China	Conference Paper	2nd International Conference On Advanced Education And Management Science (AEMS 2018)	Quantitative	Entrepreneurial environment, Entrepreneurial intention, College students	Students	China	HEI

(Continued)

Table A1. (Continued)

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
Jwara and Hoque (2018)	Entrepreneurial intentions among university students: a case study of Durban university of technology	Article	Academy Of Entrepreneurship Journal	Quantitative	Entrepreneurship, Unemployment, Mindset, Culture, Education	Students	South Africa	HEI
La Rubia et al. (2017)	Assessing the impact of the activities of the "promotion of the entrepreneurial culture programs" on the entrepreneurial intentions of the engineering students	Conference paper	11th International Conference On Technology, Education And Development (INTED)	Quantitative	<b>entrepreneurship; competences; innovation activities</b>	Students	Spain	HEI
Sankar and Irin Sudha (2016)	Determinants of entrepreneurial intention of pharmacy students in Chennai	Article	International Journal Of Pharmaceutical Sciences Review And Research	Quantitative	Entrepreneurial intention, Pharmacy students, job, environment	Students	India	HEI
Boyah et al. (2016)	Entrepreneurial intention among hospitality students: a case study in UiTM Terengganu, Malaysia	Conference Paper	3rd International Hospitality And Tourism Conference, IHTC 2016 And 2nd International Seminar On Tourism, ISOT 2016; Bandung; Indonesia; 10 October 2016 Through 12 October 2016; Code 181,039	Quantitative	Entrepreneurial intention, Hospitality students, Motivation factors, Obstacles, Push factor	Students	Malaysia	HEI

(Continued)

**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
Aloulou (2015)	The prediction of entrepreneurial intentions among preparatory year Saudi students: testing an intent model	Conference Paper	Proceedings Of The 3rd International Conference On Innovation And Entrepreneurship (ICIE)	Quantitative	Entrepreneurial Intention, Attitude, Subjective Norms, Self-efficacy, PLSPM, preparatory year student, Saudi Arabia.	Students	Saudi Arabia	HEI
Kim and Kwon (2015)	An empirical study on the factors affecting academic technology entrepreneurship in south Korea	Conference Paper	2015 Portland International Center For Management Of Engineering And Technology, PICMET	Quantitative	Spin-offs; University; Knowledge; Founders; Science; Model; Commercialization; Competence; Growth; Firms	Teachers and Students	South Korea	HEI
Rokhman and Ahamed (2015)	The role of social and psychological factors on Entrepreneurial intention among Islamic college students in Indonesia	Article	Entrepreneurial Business And Economics Review	Quantitative	social factors; psychological factors; entrepreneurial intention	Students	Indonesia	HEI
Sánchez Cañizares and Fuentes Garcia (2010)	Gender differences in entrepreneurial attitudes	Article	Equality, Diversity And Inclusion: An International Journal	Quantitative	Entrepreneurialism, Women, Gender, Graduates, Spain	Students	Spain	HEI
Griffiths et al. (2009)	Government bureaucracy, transactional impediments, and entrepreneurial intentions	Article	International Small Business Journal	Quantitative	bureaucracy; corruption; entrepreneurial intentions	Students	Australia Canada Germany, Netherlands, Norway, Mexico, Romania, Russia, Spain, and Ukraine	HEI

(Continued)

**Table A1. (Continued)**

Author and year of publication	Title of study	Publication Type	Publication Source	Study Design	Key words	Study Population	Country	Context (Educational Institution)
Radu and Redien-Collof (2008)	The social representation of entrepreneurs in the french press desirable and feasible models?	Article	International Small Business Journal	Qualitative	discourse; entrepreneurship; press; social representation	-	France	-

(Alalwany & Saad, 2015; Dinis et al., 2013; Lladós-Maslorens & Ruiz-Dotras, 2021; S. Mukhtar et al., 2021; Musetsho & Lethoko, 2017; Neneh, 2014; Romero et al., 2011; Shi et al., 2019; Valencia et al., 2015; Wardana et al., 2021; X. H. Zhu & Zhang, 2018)

The Symbol (\*\*\*) means study is available in both (EC-EI) and (EC-EE-EI)



**Appendix B.**  
 Search strategy

Search Strategy—Example of Scopus and Web of Science

TITLE-ABS-KEY	Number of sources—Scopus	Number of sources—Web of Science
"entrepreneur* culture"	814	687
"entrepreneurial culture"	700	578
"entrepreneurial culture" AND "entrepreneurship education"	49	62
"entrepreneurial culture" AND "entrepreneurial intention"	32	21
"entrepreneurial culture" AND "entrepreneurship education" AND "entrepreneurial intention"	8	8

**Appendix C**  
 PRISMA-ScR checklist

**Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist**

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
			<b>TITLE</b>
Title	1	Identify the report as a scoping review.	1
			<b>ABSTRACT</b>
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	1
			<b>INTRODUCTION</b>
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/ objectives lend themselves to a scoping review approach.	2
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	3-6
			<b>METHODS</b>
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	-

(Continued)

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	8 -9
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	9
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	9 -10
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	12
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	12
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	-
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	12
			<b>RESULTS</b>
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	12
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	-

(Continued)

<b>(Continued)</b>			
<b>SECTION</b>	<b>ITEM</b>	<b>PRISMA-ScR CHECKLIST ITEM</b>	<b>REPORTED ON PAGE #</b>
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	12
			<b>DISCUSSION</b>
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	
Limitations	20	Discuss the limitations of the scoping review process.	24
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	24
			<b>FUNDING</b>
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	

JB I = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

\* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JB I guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMAScR): Checklist and Explanation. *Ann Intern Med*. 2018;169:467-473. doi: 10.7326/M18-0850.



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