

Systematic review on sustainable entrepreneurship education (SEE): a framework and analysis

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Abstract

Purpose – Sustainable entrepreneurship education (SEE) is a field, which mingles two imperative fields of research, sustainable entrepreneurship and entrepreneurship education. This emerging area has gained momentum in recent years, and various quantitative and qualitative studies are carried upon to explore its diverse dimensions, literature remains scattered. This paper aims to explore the holistic picture of SEE by compiling the research articles, through a systematic literature review of prior research studies.

Design/methodology/approach – Two prominent databases are considered, and these databases then are searched with appropriately designed search strings. Based on an exclusion and inclusion criteria developed by the authors, 59 research papers are selected for further investigation. These research papers are then studied rigorously for review and qualitative content analysis.

Findings – A conceptual framework comprising of the areas of these research contributions is proposed as an outcome. This framework provides insights about the existing state and areas of SEE research namely: (1) Institutional framework, (2) Teaching/learning approaches and (3) External interactions and provides further direction for research.

Research limitations/implications – The present study makes a significant contribution both in theoretical and in practical sense. (1) Compiled the extant literature on sustainable entrepreneurship education; (2) Developed a protocol to conduct the systematic review of literature on sustainable entrepreneurship education; (3) Reported the status of research on sustainable entrepreneurship education, and proposed a framework on existing work; (4) Presented the emerging topics, issues and challenges that need to be addressed in future research.

Originality/value – This article seeks to present a systematic literature review of the research field on sustainable entrepreneurship education. A review of existing literature in this field would certainly help to advance future research efforts as it presents a comprehensive picture of the status quo of this research field.

Keywords Sustainable entrepreneurship education, Systematic review, Higher education, Sustainable entrepreneurship, Entrepreneurship education, Framework

Paper type Literature review

1. Introduction

While entrepreneurship initially predominantly was valued for its contribution to the economic growth of a country, its potential for the solution of societal and environmental issues has been acknowledged as well. Over the last decade, the notion of sustainable entrepreneurship has gained more and more interest with a new paradigm shift in entrepreneurship education from traditional perspectives towards sustainability inclusions (Amatucci *et al.*, 2013). Motivated young minds indulge in ventures such as eco-innovation, and sustainable start-up or project. Sustainability linked with entrepreneurship receives a high degree of academic attention, because of its growing practical relevance in various fields. Education has an important role to play in sustainable entrepreneurial goals (Vuorio, 2017). Therefore it is of vital importance for entrepreneurship practitioners, scholars and

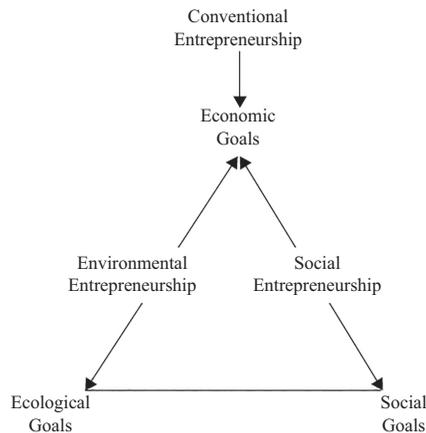


stakeholders to add sustainability to academic curricula as well as other consulting support activities (Huda, 2016). The requisite is also for sensitizing and educating future sustainable entrepreneurs.

In order to be able to have ideas for enacting sustainable business opportunities, these budding entrepreneurs may need some specific knowledge on sustainability. It may be about natural environment (Shepherd and Patzelt, 2011), societal expectations and outcomes, sustainable economic goals or, may be other competencies for sustainable entrepreneurship. It's imperative to have inclinations, attitudes and learning abilities for the active involvement in sustainable actions to improve the processes and achieve sustainable goals. Entrepreneurial education can facilitate and promote sustainable business practices (Kuckertz and Wagner, 2010; Hall *et al.*, 2010).

According to the definition given by Binder and Belz (2015): “We define sustainable entrepreneurship research as the scholarly examination of, how opportunities to bring into existence future goods and services are recognised, developed and exploited, by whom, and with what economic, social and ecological gains”. They also acknowledge the triple bottom line comprising of economical, social and ecological value creation, which is a common measure for sustainability based on Elkington (1994), who proposed that the combination of economic, social and ecological benefits results in a total win situation for businesses, society and the environment (see Figure 1). Promoting the implementation of sustainability practice has become increasingly important and is being valued by both firms and academia with university-firm cooperation through specific entrepreneurship projects for sustainability (Nave and Franco, 2019; Hernández and Briegas, 2019; Fichter and Tiemann, 2018). It can be incorporated by sustainable entrepreneurship training programs (Jens *et al.*, 2006). As the awareness generated, many higher education institutions offering entrepreneurship programs have taken initiatives to integrate sustainability-oriented courses into their programs (Lourenco *et al.*, 2013; Barber *et al.*, 2014). Need for conjunction of sustainability and entrepreneurship education is highlighted in few studies (e.g. Wyness *et al.*, 2015; Mindt and Rieckmann, 2017). Challenge in the curriculum design is to strike the right balance of sustainability skills and developing entrepreneurship (Wyness *et al.*, 2015).

It has been recognized that entrepreneurial education can help in promotion and enhancement of sustainable business practices (Kuckertz and Wagner, 2010) and can also ensure promoting sustainable development. This entrepreneurial approach emphasizes on the moral obligations facing business enterprises. In fact, this approach promotes social and



Source(s): Binder and Belz (2015)

Figure 1.
Sustainable
entrepreneurship and
related concepts

environmental responsibilities as a means of developing future entrepreneurial potential (Cohen and Winn, 2007). Educational institutes can make use the opportunity to teach sustainable entrepreneurship to an extent of which it positively influences the intentions of nascent entrepreneurs.

1.1 Research gap

Sustainable entrepreneurship education (SEE) field is gaining interest, and some authors have touched upon the subject, although in a restricted manner. Researchers (Fayolle and Jill, 2007; Obrecht, 2016) mentioned that entrepreneurship education for sustainability as a specific and matured research field is in early stage and there is absence of in-depth studies on SEE. Efforts are done towards the advancement of research in the area. In 2018 the journal Sustainability called for special issue on sustainable entrepreneurship in education and acknowledge that higher education plays vital role in laying the foundation for sustainable entrepreneurship competence but learning factors for development of these capacities are not clear. It comprised of two articles: (1) "Fostering sustainable entrepreneurs: Evidence from China college students' 'Internet Plus' innovation and entrepreneurship competition (CSIPC)", and (2) "Learning sustainability entrepreneurship by doing: Providing a lecturer-oriented service learning framework". Nadim and Singh (2011) argue that if entrepreneurship education is to deliver on its promise, it requires better focus. They present a system's view by means of an open systems approach and propose that sustainability must be something, which can be integrated into the core essence of entrepreneurship education, research and practice, with an approach, which is compatible with training and educating.

Researchers indicate a lack of integration between entrepreneurship education at higher education programs, educators and content of sustainability in the education entrepreneurship (Wyness *et al.*, 2015; Lourenço *et al.*, 2013). Hermann and Bossle (2020) in their recent unpublished paper identified gaps in having appropriate pedagogical approaches which combines sustainability and entrepreneurship in the university programs and proposed a methodological approach for teaching framework. Mindt and Rieckmann (2017) carried out a systematic literature review to examine the contemporary teaching-learning approaches and methods in higher education dedicated for sustainability-driven entrepreneurship. The authors define a relationship between entrepreneurship education and sustainability by emphasizing the role of entrepreneurs in developing solutions for products or services, which contribute towards the sustainable development. The review did not cover the holistic approach and was confined to only teaching-learning approach. This indicates that a possible relationship between sustainability and entrepreneurship education is where the sustainability competences can be developed at the individual level (Wiek *et al.*, 2011). Rashid (2019) also carried a systematic review on entrepreneurship education training and sustainable development goals with fragile states.

There does not exist any review study which talks about systematic literature review on sustainable entrepreneurship education. Therefore there is a need to address this research gap and compile all the relevant research work done on sustainable entrepreneurship in education and to identify the noticeable areas where research is going on. This research combines two important areas of sustainable entrepreneurship and entrepreneurship education (Figure 2). The study addresses these research questions or objectives:

- RQ1. What is the present status of research in sustainable entrepreneurship education?
- RQ2. How can the research on sustainable entrepreneurship education be arranged in various themes and sub-themes through a conceptual framework?
- RQ3. Identifying key research areas and emerging trends for sustainable entrepreneurship in education.

We begin the paper by laying the foundations of research in sustainable entrepreneurship education. Next, we clarify the methodological approach adopted in this paper. Then we proceed step wise with the process of systematic literature review and demonstrate the inclusion and exclusions criteria for research papers to be included for the study. A final number of 59 papers are included for the analysis and review. Through qualitative content analysis, we present the conceptual framework as an outcome of the review. The elements of the conceptual framework are further explored as a distinct research area where empirical studies can be taken up in the future. The paper concludes with a critical assessment of the present state of research in sustainable entrepreneurship in education and provides recommendations for future directions in this domain.

2. Foundations

The present study talks about the sustainable entrepreneurship education, a field which is derived from sustainable entrepreneurship and entrepreneurship education. The foundations laid in this section lead to the basis for keywords, which were later used for databases search. The key terms used for these fields are discussed here:

“Sustainable development”: There are numerous definitions for sustainable development, most widely accepted is by Brundtland Commission: “sustainable development seeks to meet the needs and aspirations of the present without compromising the ability to meet those of the future” (WCED, United Nations General Assembly, 1987). The European Commission (2015) explains the role of sustainable development as: “it provides a comprehensive approach bringing together economic, social and environmental considerations in ways that mutually reinforce each other”.

“Sustainable entrepreneurship”: Sustainable entrepreneurship should have these three forms of capital as: *economic capital* which enhances productive capacity of organizations as well as individuals in society contributing to the quality of life, *social capital* which supports the social change (Holliday *et al.*, 2002) and environmental capital provides opportunities for economic development, creativity and innovation. Cohen and Wimm (2007) define it as “the process to evaluating, how opportunities to bring into existence “future” goods and services are discovered, created and exploited, by whom and with what economic psychological, social and environmental consequences.”

“Sustainability entrepreneurship”: Shane and Venkataraman (2000) define sustainability entrepreneurship as “the process of discovering, evaluating, and exploiting economic opportunities that are present in market failures, which detract from sustainability, including those that are environmentally relevant.” Ahmed and McQuaid (2005) have explored the contribution entrepreneurship have towards the sustainable development, which may be in form of facilitating for cleaner industries, providing employment opportunities and source of technology and innovation for new services and products. Dean and McMullen (2005) define

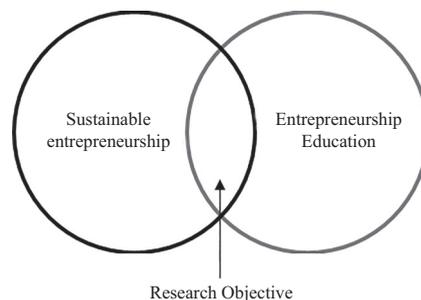


Figure 2. Exhibits the relationship between sustainable entrepreneurship, entrepreneurship education and research objective

sustainability entrepreneurship in terms of correcting “market failures that detract from sustainability”. Young and Tilley (2006) proposed sustainability entrepreneurship model and suggested economic (conventional), social or environmental entrepreneurs.

Another related term “*Sustainopreneurship*” i.e. sustainability and entrepreneurship is the use of business organizing to solve problems related to social and environmental sustainability. The definition was introduced by Abrahamsson (2006), according to which “Sustainopreneurship is used to solve problems related to social and environmental sustainability and convert the problems into business opportunities through sustainability innovations.”

“*Sustainability education*” often referred as education for sustainability development (ESD), a field which essentially calls for the practice of teaching sustainability. Avila *et al.* (2018) emphasise “it is a vital and eternal struggle that challenges people, institutions and society”. Its main aim is to provide the youth with leadership and management capabilities, along with the knowledge, skills, attitudes and values needed to forge a sustainable future (Kishita *et al.*, 2018). Few studies have addressed the linkage and the integration of entrepreneurship in sustainability education (Hermann and Bossle, 2020), as such sustainability education does not fit into the scope of present review.

“*Entrepreneurship education*”: The term refers to the development of independent ideas and the acquisition of the respective skills and abilities that are necessary to implement these ideas. Entrepreneurship education seeks to provide students with the knowledge, skills and motivation to encourage entrepreneurial success in a variety of settings. Entrepreneurship education has been found to help foster entrepreneurial attitudes in young people (Gorman *et al.*, 1997; Pittaway and Cope, 2007). Entrepreneurship education literature talks about fostering entrepreneurial attitude and required skills among the students (Henry *et al.*, 2005; Co and Mitchell, 2006; Bechard and Toulouse, 1998; Kirby, 2004). According to Jones and Iredale (2010) entrepreneurship education’s main focus is how to start a business by launching a new venture managing it over time and leading to self-employment. Enterprise education is having a broader scope, which includes effective aspects linked to the attitudes as enterprising individuals and functioning of market relations. In this paper we have used entrepreneurship education as an umbrella term while acknowledging the concept of enterprise education in our review.

“*Sustainable entrepreneurship education*”: Higher education institutions play a major role and are regarded as key players in society for promotion of sustainable development (Wyness and Sterling, 2015; Mochizuki and Fadeeva, 2010). Lans *et al.* (2014) suggest that, most important purpose of SEE is to provide entrepreneurs with skills and attitude to assess business opportunities with respect to the environmental and societal needs.

3. Methodology

Systematic review aims to aggregate large volumes of literature from a range of widespread studies into a manageable synthesis (Tranfield *et al.*, 2003; McKibbin, 2006). It provides the efficient, reliable and good quality methods for assessing the extensive literature (Denyer and Tranfield, 2006; Cook, 1997). Some of the prominent features of a systematic review are transparency of the methods used, a standard set of steps or phases and explicit inclusion and exclusion criteria. The systematic review approach is adopted in this study. The aim of our systematic review is to compose and re-structure the research in field of sustainable entrepreneurship education, identify emergent themes and further contribute to a conceptual framework development (Tranfield *et al.*, 2003). Khan *et al.* (2003) have provided steps and framework for conducting a systematic literature review, which is widely accepted and is adopted for the present study. According to their framework, these five steps are followed (see Figure 3):

Step 1: Framing the question: The research questions are presented in previous section.

Step 2: Identifying the relevant work and search strategy

3.1 Choice of databases for articles search

The search for articles was conducted for the published journal articles as well as journal articles in press on sustainable entrepreneurship, in selected academic databases, to cover a wide range of publications. The major research databases included in search are Scopus and Web of Science. Scopus is a widely used database to create datasets for systematic reviews of research (Zupic and Cater, 2015; Mongeon and Adèle, 2015). Compared to other scientific databases Scopus has a broader coverage (Moingeon and Lehmann-Ortega, 2010) and hence makes it a better option for a research review in management (Falagas et al., 2007). Web of Science is used due to its comprehensive coverage of literature in social sciences, the humanities and technology and has been used in many prior bibliometric studies on entrepreneurship (Schildt et al., 2004; Ferreira et al., 2015; Busenitz et al., 2003;

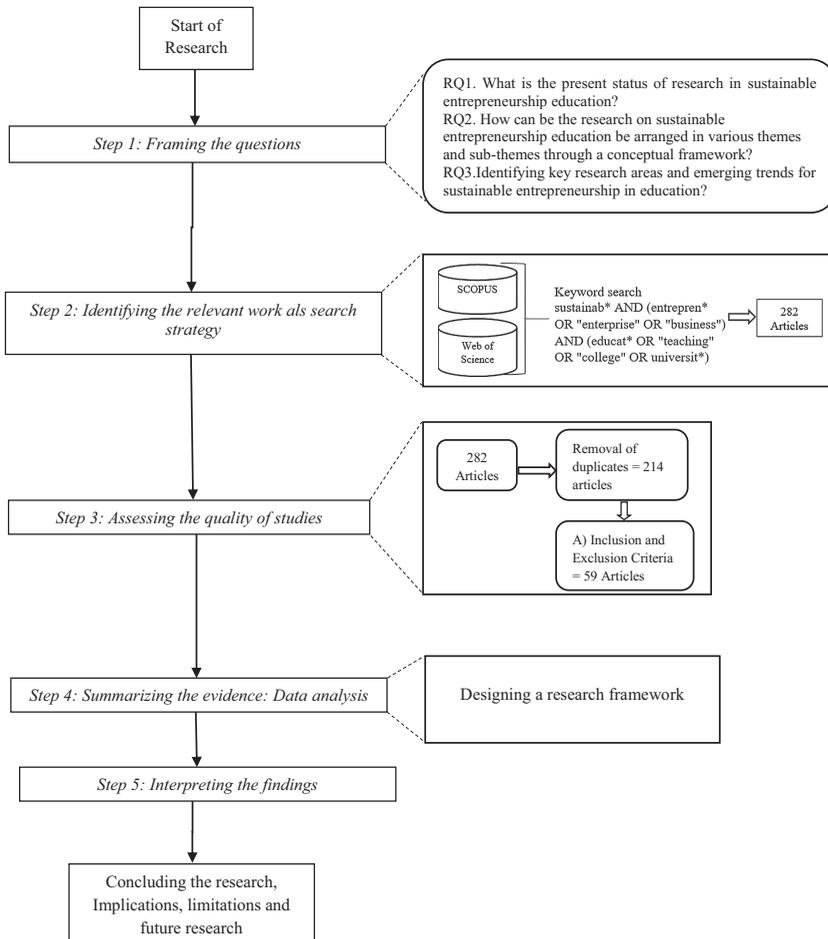


Figure 3. Systematic review process summary

Wang *et al.*, 2017). The scope of these databases supported the interdisciplinary goal of present study for covering literature from sustainability, entrepreneurship and education.

3.2 *Keywords for search*

The keywords for the search are deduced from the foundations of sustainable entrepreneurship education discussed in previous section (see Section 2). Some previous studies are also revisited to identify the keywords (Mindt and Rieckmann, 2017; Hermann and Bossale, 2020; Aikens *et al.*, 2016; Gangi, 2017). Using terms from these studies as basis, the authors created a final list of key terms that could capture all possible extant research in both areas of sustainable entrepreneurship and entrepreneurship education. The group of keywords in area of sustainability, entrepreneurship and education are given in Table 1. Search strings used are all within the range of the key terms.

The database search was conducted according to keywords given in Table 1. The search string was so designed that the target articles needed to match at least one keyword in each group. These groups demonstrate our objective to cover research at the juncture of sustainability entrepreneurship and entrepreneurship education. The exemplary search string used was:

sustainab * AND (entrepren * OR “enterprise” OR “business”) AND
(educat * OR “teaching” OR “college” OR universit *)

The initial phase of the search was confined to the titles, keywords and abstracts. The time duration for the search was 27 January 2020–2 February 2020. We excluded books, discussion papers, book chapters and other non-refereed publications, as peer-reviewed journal articles are considered the most valid (Podsakoff, 2005; Ordanini *et al.*, 2008), Although systematic reviews can also include other types of publications, for quality and to reduce sample to a convenient amount, we concentrated on English language peer-reviewed academic journal papers (Seuring and Müller, 2008). The results produced by using this search string are 194 articles from Web of Science and 88 from Scopus, which makes it 282 articles in total.

The databases being interlinked with each other, there may be some duplicates which were then removed from the search results. A count of 214 articles found to be unique and checked for further relevancy. A manual coding process using excel is carried out to order and sort the articles as follows: number, article name, database, journal name, author name, year, methodology, context and abstract.

Reliability relates to the reproducibility (same results again) and stability of the data. The search was carried on databases using the developed search string by all researchers independently at different time intervals. It was observed that the results were same in 99% of the instances. Validity relates to the honesty and genuineness of the research data and refers to the extent to which the findings are an accurate representation of the phenomena they are intended to represent. Internal validity was achieved by addressing the selection bias, by removing selection bias by researchers through a developed inclusion and exclusion criteria and strictly following it.

Step 3: Assessing the quality of studies

Table 1. Keywords used for the collection of research articles from databases

Group a	Group b	Group c
“sustainable” “sustainability”	“entrepreneurship”, “enterprise”, “entrepreneurs”, “entrepreneurial”, “business”	“education”, “university”, “college”, “teaching”, “Learning”

In this phase a detailed inclusion and exclusion criteria is developed by the authors to maintain the relevancy of the research papers included for further review as presented in [Table 2](#). Based on this inclusion and exclusion criteria, the articles were filtered on title as well as abstract analysis was carried out.

To remove the bias of studies selection for review researchers developed an inclusion criteria clearly described in detail sufficient to avoid inconsistent application in study selection. Another method adopted is dual review by the researchers to identify inclusion initially and the subjective judgment differed, which was later resolved by discussion amongst the researchers.

For the relevance, judgment is made on whether the research articles: (1) have focus on sustainable entrepreneurship education in their paper, that is, articles that only mentioned or just briefly touched on the topic are excluded and (2) within the scope of the present study are included. For articles where abstract was not sufficient the whole paper was screened. Some studies addressed the issues of sustainability in educational institutes but not talk about entrepreneurship are excluded. Some studies on sustainable education and development, these are also excluded. Articles talked about sustainability in business education or management education, but not entrepreneurship are excluded after going through the full text. These research articles were screened manually by the reviewers (authors) separately first for accessing the relevance with the present scope of review, and later co-ordinated where differences were found. The doubts are resolved by further discussion among authors and discrepancies are rectified. 158 numbers of articles found to be not relevant and therefore eliminated at this level. Rest of the 59 articles are included for the next phase for review and framework development. The final number of relevant articles included for further examination is 59 for sustainable entrepreneurship education field and the resulting list is then further pursued in both the descriptive and thematic analysis.

Journal analysis is carried out to have some insights on publication of these articles. It is noted that out of these 59 articles maximum publication are in journal Sustainability (8 articles) followed by Journal of Cleaner Production (6), and Entrepreneurship and Sustainability Issues (4). The graph in [Figure 4](#) exhibits the year-wise publication status of the selected articles. The research in field of sustainable entrepreneurship in education has gained pace in the last three years (2018–2020) as the number of articles is 29. During previous 13 years (2005–2017) it was 30 articles.

Step 4: Summarizing the evidence: Data analysis

Each of the 59 articles included in the study are read thoroughly for qualitative content analysis and thematic analysis using inductive approach suggested by [Braun and Clarke \(2006\)](#), comprising of six steps as: become familiar with the data; generate initial codes; search for themes; review themes; define themes; write-up. Manual inspection of articles generated various

Inclusion	Exclusion
Journal article	Only entrepreneurship education or only sustainability education or business education
Directly related to sustainable entrepreneurship education	Conference proceedings, books, reviews, editorials
Articles in press	No abstract available
Articles related to sustainable entrepreneurship where university students are respondents	Non-English articles
Related to any of the TBL aspects (economic, social and environmental)	Not on higher education

Table 2.
Inclusion and
exclusion criteria

codes, which are arranged in sub-themes, and then are combined together to develop the themes, in the context of sustainable entrepreneurship education. The purpose is to identify the essential dimensions of sustainable entrepreneurship in education. Extracts from the selected research articles are summarized and presented here in [Tables 3](#) and [4](#).

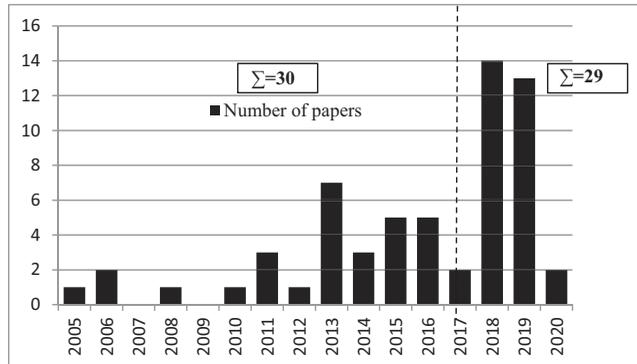


Figure 4.
Number of journal articles as published year wise

Institutional framework

Sustainable entrepreneurship ecosystem support

Policy and Culture

- Individual skills promotion
- New value creation
- Social entrepreneurship information and networking
- Innovations policy model
- Consulting support activities
- Creation of sustainable social value
- Sustainability practices
- University as a change agent
- Evaluation system
- Fostering sustainable entrepreneurs
- Local campus leadership
- Resource usage reduction

Strategy

- Regional development
- Curriculum/Course design
- Sustainability ethics and values
- Capacity building
- University spin-outs
- Competence development program

Infrastructure

- Requisite facilities and materials
- Co-ordination of social incubator
- University incubators
- Member network
- Recycle center
- Support systems
- Development of sustainable communities

Players/people involved

Educators/ lecturers

- Educators attitudes
- Teaching approach
- Learning experiences
- Teachers/instructors training
- Knowledge resources and skills
- Behaviours and practices
- Evaluates the knowledge
- Characteristics of entrepreneurs
- Educators thinking

Students

- Creative, innovative and critical thinking
- Attitude and personality traits
- Nascent entrepreneurial intentions
- Theory of planned behaviour
- Social entrepreneurs
- Moral antecedents
- Opportunity recognition
- Competencies mapping
- Sustainability awareness, sensitising, alertness
- Effectual entrepreneur model
- Management capabilities
- Critical thinking abilities

Table 3.
Codes, sub-themes and themes in relation with institutional framework

External interactions

Methods

Projects
Societal contributors
Community involvement
University social responsibility
Service learning
University linked support
Cooperative University firm (U-F) relationships
Stakeholder collaboration approaches
University-industry partnership
Education and outreach
Networks

Teaching learning approaches

Experiential ecosystem
Research implementation
Research projects
Live consulting projects
Concepts and tools
Complex problem-solving
Presentation training
Internship
Service learning
Lateral thinking
Team learning
Case competitions
Action learning methods
Practical learning of entrepreneurship
Action research
Cross-national student collaborations
Intelligent tutoring systems
E-learning
Technology enhanced learning
Pedagogical theories

Agencies

Social enterprise
Government enterprise
Innovation in Fragile states
Industry
Outside businesses
Private sector, agencies

Table 4.
Codes, sub-themes and
themes in relation with
external interactions
and teaching-learning
approaches

3.2.1 Process of creating the framework. Framework was designed using synthesize literature and applying coding schemes to extract pertinent information from the literature. Conventional content analysis method is used to develop the framework. The categories and names for categories were allowed to emerge from the data and use of preconceived categories was avoided. The common ground of these procedures is the classification or categorisation of data segments. According to the terminology of [Miles and Huberman \(1994\)](#), the words used for characterising these categories are codes. These steps were followed:

- (1) Structuring and coding data: during coding, each study was taken into consideration and was divided initially into various segments. Later these segments were assigned codes using the open coding method.
- (2) As progress was made with the analysis, further subcategories were included to identify meaning connections.
- (3) Subcategories related to each other were then clubbed in categories according to the aim of research aim as well as theoretical insights from the literature study.
- (4) The analysis of the studies was done according to the content analysis process.

- (5) Raw data was first organised into the subcategories or themes by following the analytic hierarchy (Ritchie and Lewis, 2003). The labelling of this data was done which resulted in the generation of codes (Farber, 2006). It is primarily based on inductive reasoning, where the sub-categories and categories emerged through data. The approach was iterative in nature which allowed the revisit of the coding process.

Codes were then summarised by using the content analysis, and a frequency table of counts of codes was generated as an outcome. This summary table of codes was then analysed, followed by grouping the similar concepts as sub-categories. In the next level of abstraction, sub-categories relate to each other in some analytical way were categorised (Strauss and Corbin, 1990).

Within-study bias refers to variability in the coding by the coders, i.e. researchers here. Disagreements were resolved by discussions. Expectancy bias, which can occur during the synthesis of primary study data as researchers may have differing perspectives that influence the interpretation of study findings. It is achieved by engaging all researchers with no prior conception of the refined theoretical framework (Schlosser *et al.*, 2007).

3.2.2 Proposed framework. The themes and sub-themes extracted from Tables 3 and 4 and from each of these building blocks we constructed a conceptual framework as proposed below:

- (1) Institutional framework
 - Sustainable entrepreneurship ecosystem support
 - Policy and Culture
 - Strategy
 - Infrastructure
 - Players/people involved
 - Educators/lecturers
 - Students
- (2) External Interactions
 - Methods
 - Agencies
- (3) Teaching Learning Approaches

Step 5: Interpreting the findings (Conceptual Framework)

Based on these tables and relationships, the conceptual framework for sustainable entrepreneurship education is presented in Figure 5.

4. Results

The results summarise the research domains of sustainability entrepreneurship education into three main areas or themes: Institutional framework, teaching-learning approaches and external interactions. Also sub-themes are identified within these domains.

4.1 Institutional framework

4.1.1 Sustainable entrepreneurship ecosystem support. Educational institutes play major role in innovation and sustainable socio-economic development (Abdulwahed, 2017). Researchers

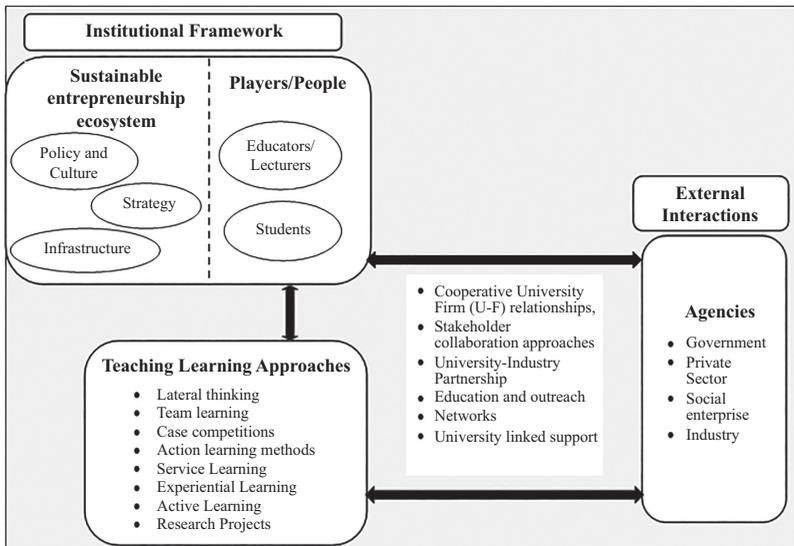


Figure 5.
Conceptualization of
sustainable
entrepreneurship
education

noted that a university's contribution to sustainable entrepreneurship development is imperative and universities can actually play a major role of change agent for growth of sustainable communities (Holzbaur, 2005; Coman, 2008). Developing a sustainable entrepreneurship ecosystem support at universities may also lead to an effective regional development (Wagner *et al.*, 2019), which favours university entrepreneurship in the area of sustainable entrepreneurship. A robust ecosystem comprising of policies and culture, strategy, and infrastructure specially designed for sustainable entrepreneurship can provide an overall boost up.

4.1.1.1 Policy and Culture. Key policies integrate sustainability and entrepreneurship and can include Sustainable entrepreneurship vision promotion (Bonnet *et al.*, 2006), value education (Parra, 2013), entrepreneurial initiative and entrepreneurial culture (Espada *et al.*, 2018; Wagner *et al.*, 2019). In doing so, universities do support knowledge spillovers to improve sustainable entrepreneurial ecosystems. Coman (2008) puts emphasis on transformational entrepreneurship which may lead to change in the values and behaviour of stakeholders. Integrative and additive approaches by setting up an integrated competence framework can be another approach to the SEE (Tiemann *et al.*, 2018; Lans *et al.*, 2014). Researchers suggest the educational model of higher education implementation of sustainability practices, strategies and sustainable innovations (Fleaca *et al.*, 2018; Tiemann *et al.*, 2018; Biberhofer *et al.*, 2018). Chen *et al.* (2018) argue on business sustainability practices which can be adopted as a culture at university level.

Local and indigenous rules and regulations, macro-policies, entrepreneurial cultures and attitudes, competence, policy model, policy framework is needed for making better choices in formulating, developing, delivering and promoting sustainable entrepreneurship and enterprise education (Kaklauskas *et al.*, 2017; McKeever *et al.*, 2014; Mukhtar and Redman, 2015). Wakkee *et al.* (2019) propose that local campus leadership, a holistic teaching and research programme and student involvement can have significant local effects. Klapper and Farber (2016) talk about the policy of evaluating alternative approaches to sustainable enterprise education. Kaklauskas *et al.* (2017) propose an evaluation system for university-industry partnership through sustainability enhancing options for entrepreneurial

universities. Few other areas of focus are research, development and innovation performance, transfer and absorptive capability and technology development for sustainability education (Kaklauskas *et al.*, 2017; Abdulwahed, 2017).

4.1.1.2 Strategy. State universities are gradually being transformed from traditional teaching and research institutions towards players of societal role in sustainable, economic, and regional development, education innovation agenda and novel institutional practices for regional economic development (Wagner *et al.*, 2019; Valdes *et al.*, 2019; Wakkee *et al.*, 2019). Biberhofer *et al.* (2018) suggest an organizational strategy for facilitating work performance of sustainability-driven entrepreneurs through higher education. Abdulwahed (2017) outlines the organizational structure with its various programs and activities for implementing its stated vision, mission and strategic objectives. Some studies talk about entrepreneurial competences teaching process framework and sustainable entrepreneurship capability framework (Amatucci *et al.*, 2013; Hermann and Bossle, 2020). Aligning strategy with sustainable development goals with a process scoping diagram to capture and conceptualise the educational model needed to guide the higher education institutes through the process of change in its daily operations (Fleaca *et al.*, 2018; Lewrick *et al.*, 2011).

Emphasis on industry-oriented business sustainability curriculum building and designing sustainability oriented courses is given (Hermann and Bossle, 2020; Chen *et al.*, 2018) in studies, along with design and delivery of an entrepreneurship course to encourage participants' lateral thinking and incorporated intelligence when developing sustainable business models (Karlusch *et al.*, 2018). Recommendations to revise the university programmes, education about sustainability and integrate within existing entrepreneurship curricula are provided in some studies (e.g. Martinez-Campillo *et al.*, 2019; Wyness *et al.*, 2015; Amatucci *et al.*, 2013). As per Lewrick *et al.* (2011) and Obrecht (2016) entrepreneurship and innovation education has derived from established university curriculum and the context is set for concepts and tools used in the corporate world. Throop *et al.* (2013) suggest a sustainability-focused general education program for environmental liberal arts curriculum for sustainability entrepreneurs. Herman and Maira (2020) insist on university-led competence development for the interaction between educators and managers.

4.1.1.3 Infrastructure. Infrastructure support be physical or otherwise acts as a better learning settings for facilitating work performance of sustainability-driven entrepreneurs through higher education (Biberhofer *et al.*, 2018), be it institutional arrangements, communication networks, motivation, information and networking, education, research and direct support, supporting structures and methods (Kaklauskas *et al.*, 2017; Holzbaaur, 2005). Infrastructure supports the co-ordination of social incubator recycle centre for research co-operation, managing eco-cycle with social enterprise approach for cooperatives and community-based development models (Estivaleta *et al.*, 2018; Md Zain *et al.*, 2013; Smith-Nonini, 2016). Fleaca *et al.* (2018) suggest specific processes architecture for sustainable developmental goals.

Core activities for developing university support systems being research or implementation projects and dialogue processes (Fichter and Tiemann, 2018). Few authors have addressed and demonstrate the institutional framing of support activities with other elements of the university to encourage innovation and sustainable entrepreneurship (Tiemann *et al.*, 2018; Holzbaaur, 2005). As per Bigdeli *et al.* (2015) infrastructure support fosters the entrepreneurial businesses actually grow, evolution of university spinouts business models. Entrepreneurship scholars and practitioners can develop management capabilities and consulting support activities (Amatucci *et al.*, 2013; Lewrick *et al.*, 2011).

4.1.2 *Players/people involved.* 4.1.2.1 Educators/lecturers. Entrepreneurial education can positively impact upon sustainability educators behaviours and practices (Amatucci *et al.*, 2013; Lewrick *et al.*, 2011) and learning experiences of both students and lecturers is imperative for sustainable entrepreneurship education (Bonnet *et al.*, 2006). Wyness *et al.*

(2015) talk about entrepreneurship educators attitudes and suggest entrepreneurship educators to reconsider their pedagogical approaches to encapsulate systems thinking, entrepreneurship educators thinking and entrepreneurs contribution. [Nwambam et al. \(2018\)](#) insist on regular training and retraining of lecturers/instructors, provision of requisite facilities and materials by the universities. [Ruiz-Ruano and Jorge \(2016\)](#) shed light on the characteristics associated with entrepreneurs, and potential entrepreneurs, among university teaching and research staff, whose entrepreneurship is grounded in sustainability. [Michels et al. \(2019\)](#) argue that the enterprise educator's member network and educator's ecosystem is unique and important for providing a sustainable forum through which enterprise educators can engage, share practice, find identity, develop ownership of and deliver sustained innovation in enterprise education. Educators evaluate their knowledge with theoretical lens of communities of practice ([Wyness and Jones, 2018](#)) and evaluate alternative approaches with intention to create social enterprise educators ([Klapper and Farber, 2016](#)). The interaction between educators and managers fosters knowledge translation between educator and manager/innovator ([Herman and Maira, 2020](#)).

4.1.2.2 Students. [Md Zain et al. \(2013\)](#) indicate that moral antecedents, entrepreneurial opportunity recognition, pro-environmental behaviour values and moral competencies should be incorporated among the students and universities have an important role in supporting sustainable entrepreneurship by sensitising and educating future sustainable entrepreneurs ([Tiemann et al., 2018](#)). The role of universities as change agents in regional economic development has been highlighted through entrepreneurship education and outreach activating entrepreneurial scholars as social entrepreneurs ([Wakkee et al., 2019](#); [Estivaleta et al., 2018](#)). [Salamzadehet et al. \(2013\)](#) recommend inclusion of six competencies, which constitute a competence framework and considered sustainable entrepreneurs as change agents. Researchers suggest the monitoring students' sustainable entrepreneurship development, awareness, intentions/support and the contextual elements for social entrepreneurship ([Lans et al., 2014](#); [Ploum et al., 2018](#)). [Espada et al. \(2018\)](#) included measures for young people/students to acquire the skills and abilities required for entrepreneurship through the education system. Competencies as well as deeper levels of knowledge regarding values and worldviews are key dimensions constituting sustainable development entrepreneurship ([Biberhofer et al., 2018](#); [Klapper and Farber, 2016](#)).

[Fichter and Tiemann \(2018\)](#) appeal the policy makers that sustainable entrepreneurship should be addressed in (higher) education, to prepare the mind-set of future "green entrepreneurs" considering the students' interest and demand. Need is of development of an entrepreneurial mindset that can contribute to openness and management of organisations and for the preservation of the environment ([Severo et al., 2018](#); [Diaconeasa and Constantin, 2019](#)). [Lourenco et al. \(2013\)](#) examine the relationship between nascent entrepreneurs' intentions to exploit learning and the extent of a profit-first mentality. [Coman \(2008\)](#) insists that there is need of a new type of entrepreneur, the one who is the product of institutions where sustainability is taught and exercised.

Student should be thinking more creatively, innovatively and critically with critical thinking abilities, develop an attitude and personality of caring for the environment ([Zain et al., 2013](#)). Experiential learning can bring potential changes in students' attitudes ([Klapper and Farber, 2016](#)). Developing professional competencies and personal qualities have an impact on professional activities ([Lans et al., 2014](#); [Isoraite et al., 2014](#)). Personality traits influence on sustainable entrepreneurial intention, entrepreneurial alertness, opportunity recognition, sustainability orientation ([Yan et al., 2018](#); [Fatoki, 2019](#)). [Lourenco et al. \(2013\)](#) implemented the theory of planned behaviour for identifying the nascent entrepreneurs' intentions. [Obrecht \(2016\)](#) used [Saravathy's \(2001\)](#) effectual entrepreneur model for student's identity and personal knowledge capabilities, variety, complexity needs. Certain studies aim to analyse how the university students preparation through knowledge and

professional skills acquired during undergraduate studies have been perceived by the graduate students, also how the higher education contributes to the development of sustainable entrepreneurship in rural areas (Diaconeasa and Constantin, 2019; Martinez-Campillo *et al.*, 2019).

4.2 Teaching-learning approaches

Parra (2013) attempts to promote a sustainable entrepreneurial vision through the incorporation of new values for teaching/learning of potential entrepreneurs. Teaching-learning experiential ecosystem favours university entrepreneurship in the area of sustainability and innovation acceleration (Valdes *et al.*, 2019). Studies exhibit the state current teaching-learning approaches and methods for sustainability-driven entrepreneurship (Mindt and Rieckmann, 2017; Klapper and Farber, 2016). Severo *et al.* (2018) emphasise the need of encouraging entrepreneurship in teaching learning processes, innovation teaching, environmental sustainability teaching. Service learning being an innovative teaching method which combines learning and social service to improve graduate employability and learning quality (Martinez-Campillo *et al.*, 2019; Halberstadt *et al.*, 2019).

Fatoki (2019) propose to improve the sustainability orientation of university students focus on passive and active teaching methods of sustainable entrepreneurship such as lateral thinking, team learning. Siqueira *et al.* (2014) suggest on engaging students in active learning approaches such as, live consulting projects, experiential learning methods, case competitions, case studies, action learning methods and cross-national student collaborations. Active learning approaches provide a platform for promoting collaborations among students and the external organisations for accomplishment of socially beneficial goals. Students' critical thinking abilities were further developed as a result of the changed learning engagements. Klapper and Farber (2016) talk about students, who change their mind about becoming an entrepreneur after participation in the experiential learning component of a course. Additionally, the changed learning engagements and teaching approach engendered student responsibility for learning outcomes (Jennings *et al.*, 2010).

Entrepreneurship, sustainability and project education can be combined successfully in a subject with lectures, presentation training and project work in which a business plan is written (Bonnet *et al.*, 2006). Klapper and Farber (2016) register that their findings have inferences for entrepreneurship and social enterprise teaching. It is regarding the design in particular. The implementation of training having students involvement through self-initiated social enterprise projects by students. Creation and characteristics of sustainable social value in social entrepreneurship projects can be incorporated (Espada *et al.*, 2018). Many approaches to social justice-oriented green initiatives such as environmental education workshops, practical learning of entrepreneurship are suggested (Smith-Nonini, 2016; Zain *et al.*, 2013).

4.3 External interactions with agencies

Serban and Ion (2011) emphasise on importance of entrepreneurship education in country's economy. Need is to boost the national economies with skilled graduates (Higgitt, 2006). According to Rashid (2019), entrepreneurship education and sustainable development goals combine innovation in fragile states. Key players from industry and support the concept of university-industry partnership for sustainability leading to well-adjusted progress. University-firm cooperation is a way to promote sustainability practices and develop cooperation relationships (Nave and Franco, 2019). This can be of great importance for universities supporting entrepreneurship and like to strengthen their links with corporate houses and reduce the scooping effect of globalisation in disadvantaged regions. Government

and private individuals and organisations should collaborate to provide necessary resources to university graduates universities, government and individuals for instructional efficiency and effectiveness as this is critical to national development (Nwambam *et al.*, 2018). Active learning approaches provide an opportunity to promote collaboration between students and external organisations in pursuit of a socially beneficial goal (Siqueira *et al.*, 2014). Wagner *et al.* (2019) analyse these interdependencies through university-linked support programmes for sustainable entrepreneurship and the effects on sustainable regional development through sustainable entrepreneurial ecosystems.

Service learning combines learning and social service to improve graduate employability and learning quality (Martinez-Campillo *et al.*, 2019; Halberstadt *et al.*, 2019). Wakkee *et al.* (2019) in a study indicate to characterise the entrepreneurial university by presenting universities as drivers for sustainable change through education and outreach leading to the creation of significant sustainable local impact. The corresponding community aspects are covered through project learning, project education and competencies along with characteristics and creation of sustainable social value in social entrepreneurship projects (Ambros and Biberhofer, 2018; Bonnet *et al.*, 2006; Holzbaur, 2005; Espada *et al.*, 2018). Stakeholder collaboration approaches, research or implementation projects, dialogue processes with external agencies is another effective method (Fichter and Tiemann, 2018; Chuvakhina *et al.*, 2018).

5. Discussions

This paper aimed to provide a conceptual framework that can be used to summarise the prominent research done in the area of sustainable entrepreneurship in education and to further identify the recent areas which can be taken up to conduct further research studies. The proposed framework exhibits the extant state of research in the field of sustainable entrepreneurship education. A topic-wise summarization of number of articles as per the main themes/sub-themes is exhibited in Figure 6. One of the dominant areas of research is about students, their competencies, mindset, trait, behaviour towards sustainability. Many researchers have contributed towards it, as almost 50% of the inclusions have addressed this. Various researchers have included well-accepted theories such as socio-cognitive career theory, Sarasvathy's effectual entrepreneur' model and innovation theory and have explored their connection in relation to the sustainable entrepreneur. A related but less explored area where there seems to be scarcity of research studies is about role of educators.

Strategies, policy, culture and infrastructure being other areas of importance and researchers have explored this too. Emerging areas are the universities' outside collaborations, connections and methods. Sustainable entrepreneurship can be fully achieved with government involvement as well as support from the businesses and industry. This context is less explored in its existing state and hence probe for more research can be solicited for the

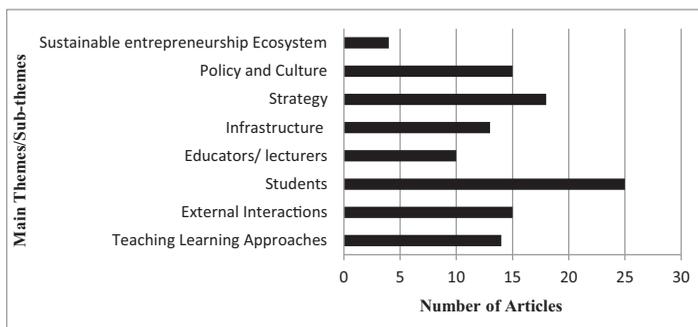


Figure 6.
Number of articles
topic-wise

same. Research studies on societal contributions have gained some momentum and have studies on social and environmental areas related to entrepreneurship.

Two studies which could not be fit anywhere in the framework is on sustainable entrepreneurship and women, which deals with gender equity or inequality (Vinokurova, 2015). Reppel (2012), advocates a market-based approach to sustainability with micro-marketing approach, is discussed in the context of a new marketing program exploring the intersection between marketing, markets and society. The rest of the studies could find their place in one or more components of the proposed framework.

6. Contribution of the study

It can be concluded that the present study makes a significant contribution both in theoretical and in practical sense.

6.1 Theoretical implications

(1) Compiled the extant literature on sustainable entrepreneurship education; (2) Developed a protocol to conduct the systematic review of literature on sustainable entrepreneurship education; (3) Reported the status of research on sustainable entrepreneurship education, and proposed a framework on existing work; (4) Presented the emerging topics, issues and challenges that need to be addressed in future research. This proposed framework incorporates recent advice from a growing literature on reviewing research in the sustainable entrepreneurship education.

6.2 Practical implications

By expanding on the various components of the proposed framework, we presented a blend of existent research considering the meaningful insights from research articles included. The results provided a framework on sustainable entrepreneurship education, which can provide meaningful insight and directions to the practitioners as well as educators, which can be implemented in their policies and procedures.

7. Limitations and future research avenues

This research review has certain limitations and by no means does this review claim to cover all publications dealing with the concept of sustainability and entrepreneurship education. This review is based on the inclusion of articles from two databases Scopus and Web of Science. Another limitation is that only higher educational institutes are considered, as entrepreneurs being mature and entrepreneurial ventures are usually taken up during higher education. There can be study inclusive of school education, and its role in sustainable entrepreneurship education can be explored. There is a need to bring existing entrepreneurial intention models in the context of sustainable entrepreneurship.

Sustainable entrepreneurship education being a relatively new field (Obrecht, 2016), most of the research is done in the last five years. According to Edmondson and McManus (2007), when a field grows and matures, some empirical studies are expected, which are based on variance models, hypotheses testing and field surveys. Role of educators is less explored area of research, although it's being important in curriculum delivery and teaching learning approaches. Gender equity could be an area of interest for researchers who are inclined towards gender issues and wish to explore it in area of sustainable entrepreneurship in education. Various fields of sustainable entrepreneurship education, and many other related fields such as business ethics and human resource management need to be studied in the context of each other. There is hardly any work addressing the challenges, issues and

dilemmas that sustainable entrepreneurship education may enact and therefore these need to have researched. The future directions for research derived from results and conclusion, in this area can be on:

- (1) Modern teaching/learning environment or ecosystems that enable the development of sustainable entrepreneurship.
- (2) The role of teachers in realizing sustainable entrepreneurship education processes, curriculum design and outcomes.
- (3) Sustainable entrepreneurship education aimed at values, moral competence, systems thinking, foresighted thinking and a normative-ethical approach.
- (4) Competencies mapping of students with the need from industry or government agencies.
- (5) Implementation of sustainable entrepreneurship in education and measuring/ assessing the effectiveness of processes and outcomes of it.
- (6) Entrepreneur's personal learning abilities and with reference to the already existing theories such as behavioural theory, cognitive theory.

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